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Styling a Sustainable Future: Investigating Threats and Responsible Practices in the Fashion Industry

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Abstract

This thesis investigates the Environmental, Social, and Governance (ESG) impacts of the textile and fashion industry. The sector plays a key role in global commerce, yet faces growing scrutiny for its environmental footprint, immoral social practices, and corporate governance standards. From the environmental perspective, the textile industry lies between the fourteen priority sectors for achieving carbon neutrality, given the excessive production that jeopardises raw materials' supply and exacerbates waste generation, resulting in high environmental criticality. The research aims at quantifying the magnitude of impact on the depletion of natural resources, including water and energy consumption, land use and biodiversity. Additionally, analysing its contribution to pollution through chemical usage, accumulation of waste directed to disposal, and greenhouse gas emissions.

From the social point of view, the thesis explores labour practices, working conditions, and human rights issues, with particular attention to the industry's supply chain. Under examination is fashion companies' positioning in terms of compliance with ethical labour standards, fair wages, and worker safety, particularly in regions with weak regulatory oversight and limited enforcement mechanisms.

In terms of governance, the analysis focuses on fashion labels' adherence to responsible procurement and marketing practices, as well as the integrity and transparency of their business operations. This section sheds light on the critical need for companies to reinvent their business models through sustainable innovation, showcasing successful examples of brands that have integrated eco-friendly practices throughout their value chain.

To close the loop, after examining regulatory gaps, policymakers' efforts to reform the legislative framework and the gravity of impacts caused by production models in recent decades, it is crucial to focus on consumer behaviour. Purchasing habits and wardrobe management have adapted to the accelerated cycle of fashion seasons, prioritising affordability and trendiness over long-term value and environmental impact. Consequently, items are worn only a few times before being deemed "out of fashion" and discarded.

To better understand this dynamic, a survey was conducted targeting voters from different age groups, assessing their purchasing preferences, habits, and level of awareness regarding more sustainable alternatives. The objective was to identify the key barriers preventing consumers from adopting eco-friendly practices more consistently and to understand which areas of improvement could encourage greater commitment to sustainable fashion. Consumers play a pivotal role in driving transformative change in the industry. Educating them on the value of buying less but keeping items for longer is the first step towards reshaping the entire sector—curbing overproduction, reducing waste, and alleviating worker exploitation. In essence, the future of fashion depends significantly on informed consumer choices, which can guide the industry towards a more sustainable offering and more rigorous ethical principles.

Table of Contents

1. Introduction

1.1 Background and significance of the fashion industry

The origins of the fashion industry can be traced back centuries, woven deeply into the fabric of human civilisation. From artisanal craftsmanship to industrialisation and globalisation, the art of textile manufacturing has served as symbols of status, self-discovery, and cultural heritage, marking profound shifts in production, consumption, and identity formation.

The Industrial Revolution heralded a new era of product development, transforming cottage industry realities into automated enterprises. Textile mills emerged as centres of innovation and economic growth, harnessing steam power and mechanised looms to mass-produce fabrics at unprecedented speeds. This era witnessed the rise of fashion as a global phenomenon, with Parisian couture houses and British garment factories setting trends and standards for style.

In the 20th century, fashion underwent a democratisation, as ready-to-wear collections and department stores made high fashion accessible to broader audiences. The post-war period saw the emergence of iconic designers, whose visionary designs captured the zeitgeist of the era. Meanwhile, the proliferation of synthetic fibres and new dyeing techniques revolutionised textile production, paving the way for mass consumerism and disposable fashion.

Today, the apparel industry is a sprawling ecosystem of designers, manufacturers, retailers, and consumers, generating USD 1.73 trillion in revenue[1] and employing 430 million people worldwide, accounting for 12.6% of the world's working population[2]. From haute couture to fast fashion, the industry caters to a spectrum of tastes, budgets, and lifestyles, driving trends and consumption patterns on a global scale.

[1] Smith P. (2024) *Global revenue of the apparel market 2018-2028*
[2] Solidarity Center (2023) Global Garment and Textile Industries. Workers, Rights and Working Conditions

Despite its economic prowess and cultural significance, the textile industry stands at a crossroads, grappling with pressing sustainability concerns that threaten its long-term viability and social impact. The sector's rapid expansion has come at a steep cost to the environment, with unsustainable practices leading to pollution, water scarcity, and biodiversity loss. Moreover, labour exploitation, poor working conditions, and inequitable supply chains have raised profound social justice issues, casting a shadow over the industry's ethical integrity.

1.2 Fast fashion: the race for cheap and trendy

Traditionally, the clothing industry used to operate on a slow and predictable cycle. Fashion brands typically released new collections seasonally, with two primary seasons—spring/summer and fall/winter—dictating the flow of new garments. This pace allowed for more deliberate design processes, higher quality production, and longer lead times for manufacturing and distribution. Clothing was often viewed as a long-term investment, with consumers purchasing durable, timeless pieces meant to last for several years.

A pivotal moment came on December 31, 1989, when The New York Times published an article by journalist Anne-Marie Schiro titled "Two New Stores That Cruise Fashion's Fast Lane." The article marked the opening of two new boutiques on Lexington Avenue, aimed at fashion-conscious young people on a limited budget who frequently updated their wardrobes. The standout was the first international Zara store in the city, located at the corner of 59th and Lexington, offering items ranging from $5 knit gloves to $145 coats, as well as metallic knit skirts and dresses priced between $27 and $43. The new business model was clear: change the store inventory every three weeks to keep up with the latest trends.

This is considered as the first appearance of ‘Fast fashion’, referring to a contemporary model of clothing production and retail that prioritises rapid design, manufacturing, and distribution of apparel to keep up with the newest tendencies. This model relies on quick turnaround times and frequent inventory rotation, enabling retailers to offer new collections multiple times a season at

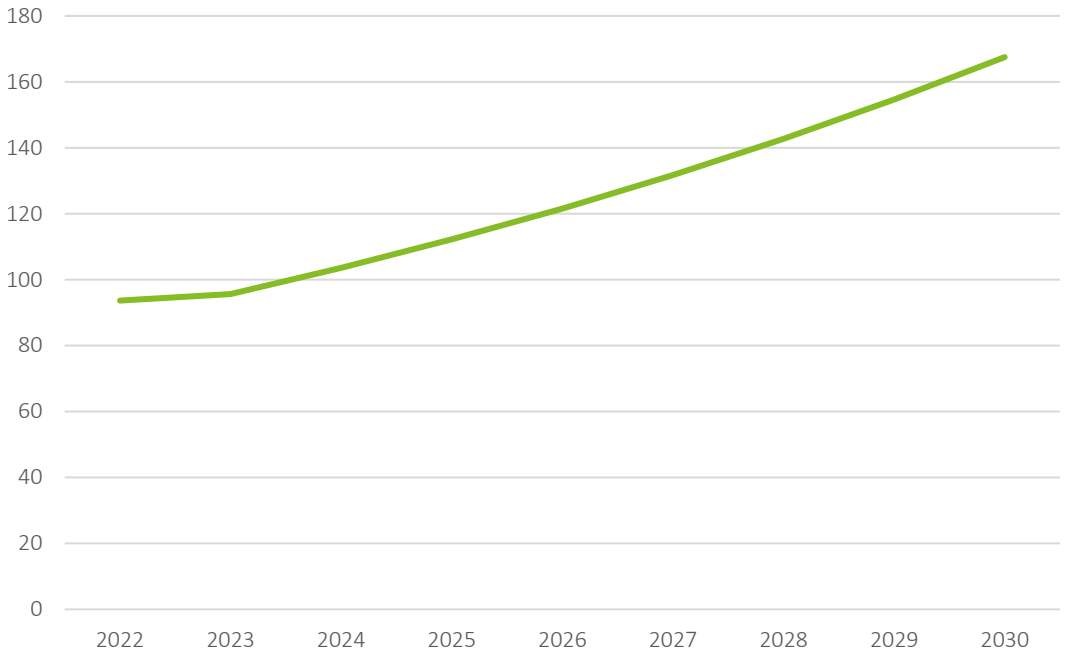
affordable prices. This industry thrives on consumers' desire for trendy and inexpensive clothing, but it also raises significant environmental and social concerns due to its impact on sustainability.

The phenomenon is fuelled by a cycle of continuous production and consumption. Key components of the fast fashion model include trend identification, where brands employ advanced market research and data analytics to quickly capture emerging fashion trends from runway shows, celebrity styles, social media, and street fashion. Once trends are identified, design teams rapidly create new clothing items, focusing on speed and cost-efficiency rather than originality. Manufacturing relies on a global network of suppliers, often in countries with lower labour costs, allowing for rapid and inexpensive production. Efficient logistics systems ensure that new products are quickly distributed to retail stores and online platforms, encouraging consumers to make quick purchasing decisions driven by the fear of missing out on the latest styles. Brands engage consumers through aggressive marketing strategies, including social media campaigns, influencer partnerships, and promotional discounts, creating a continuous demand for new products.

The fast fashion industry has seen significant growth over the past decade, driven by the growing youth population’s demand for affordable clothing.
According to Kings market research, the global fast fashion market was valued at USD 93.66 billion in 2022 and is projected to reach USD 167.50 billion by 2030 (see Figure 1), growing at a CAGR of 7.70%. This expansion is powered by the proliferation of online shopping and the increasing influence of social media on fashion trends, coming however with substantial environmental and social costs. Fast fashion is associated with high levels of waste, as 4-9% of all the textile products put on the European market are destroyed even before use[3], and with poor labour practices in its supply chain, including low wages and unsafe working conditions.

[3] ‘The destruction of returned and unsold textiles in Europe’s circular economy’, European Environment Agency.

Figure 1 - Value of the Global Fast Fashion Market (USD)



Source: Kings Market Research

1.3 Overview of ESG principles and their relevance

The framework of Environmental, Social, and Governance (ESG) principles has emerged as a foundational tool to guide stakeholders in understanding a company's overall sustainability. This research will focus on deeply analysing the impacts, risks, and opportunities for improvement within the individual aspects that make up each sphere. In the fashion industry, it is particularly crucial to examine these factors due to its complex, resource-intensive production cycles, vast and dispersed value chains, and its significant influence on global communities.

Environmental considerations are critical for an industry heavily dependent on natural resources such as water, energy, and raw materials. To properly assess its environmental footprint, we must take into account the wide variety of textile products, distinguishing between the impacts of both natural and synthetic fibres. The latter, which now make up 70% of the market, present unique challenges that must be addressed. A multi-faceted evaluation is needed to understand

the severity of the environmental impact based on the specific type of product, material, and production process, allowing the industry to prioritize interventions where they are most urgently needed.

The Social aspect focuses on the human element, emphasizing the importance of fair labour practices, worker rights, and community engagement. The fashion industry has long faced criticism for the exploitation of its workers, particularly in developing countries where freedom of association and human rights' protections are often lacking. In these contexts, brands frequently rely on subcontractor factories that exploit labour, paying workers far below a living wage, forcing them into endless shifts under unsafe working conditions. When scandals arise, brands often claim they lack oversight of their supply chains, as if the enormous markups they achieve by sourcing materials at rock-bottom prices aren't clear indicators of the unequal distribution of profits. The truth is that brands often choose to turn a blind eye to these injustices in order to protect their bottom line, while workers bear the brunt of the imbalance.

The Governance pillar, finally, covers everything from the integrity of a company's leadership to compliance with regulations and how it interprets and communicates its values. Good governance means expanding a company's vision and mission beyond mere economic goals, integrating sustainability themes to create and share value that is both traceable and measurable over time. In the fashion industry, achieving this requires several factors. First and foremost, product and process innovation is needed to close the loop on textile products, ensuring that garments which currently end up in landfills, incinerated, or discarded in places like the Atacama Desert in Chile, can be mechanically processed and reintegrated into the production cycle to become new clothing.
Secondly, governance involves the ability to make a company's activities and actions visible and tangible to all stakeholders. This definition is particularly relevant in the textile industry due to the lack of transparency and authenticity in product information and marketing campaigns. Brand claims regarding sustainability are often vague, misleading, or exploit informational asymmetries to deceive consumers which are attempting to choose eco-conscious solutions.

Statements about product composition, environmental impacts of production processes, and sustainability characteristics must be scientifically grounded, fully transparent in showing weaknesses rather than concealing them behind strengths and must be evaluated across the entire value chain.

The disclosure of ESG information, performance, and initiatives is no longer seen as a mere trend but as a strategic necessity for fashion brands aiming for longevity and success. Investors are increasingly factoring in ESG metrics when making decisions, recognizing that companies with strong sustainability practices are often better equipped to manage risks and seize opportunities.

1.4 The essence of sustainable fashion and its relationship with the SDGs

Some brands and consumers are genuinely interested and proactive in making a difference, demonstrating that the course can be reversed by adopting a culture of awareness around ESG principles in their business models and purchasing choices. This has given rise to a true movement of sustainable fashion. But what does sustainable fashion actually mean?

Sustainable fashion can be viewed as a mechanism that promotes more conscious and committed ways of living on a planet too precious to be depleted of its resources. It encompasses both tangible elements, such as garments designed to have a lower environmental impact, and abstract concepts. Awareness, in fact, plays a fundamental role, as the solution to a problem often does not lie solely in creating something new. Frequently, it is enough to change our perspective, becoming more conscious of the origins of the damage and understanding what can truly make a difference.

The textile industry has the opportunity to adopt a different approach, balancing profit and growth with a sense of purpose, creating added value and prosperity for the environment, society, and the global economy. The goal of sustainable fashion is to establish thriving ecosystems and communities through initiatives that may include increasing the value of local production and products, extending the lifecycle of materials, reducing waste and environmental

damage resulting from production and consumption, and educating fashion enthusiasts on environmentally respectful consumption. This, in turn, enhances the appreciation for timeless clothing.

Sustainable fashion is gaining more and more prominence in the clothing, leather, and footwear industries, as a true paradigm shift toward greater ecological integrity and social justice. This approach is not limited to the production chain; it requires considering the complex and long-term interconnections between economic, financial, material, ecological, social, and cultural contexts, which involve various production levels and, in an unprecedented role, even the final consumers.

The global scale and reach of the fashion industry, as well as the severity of its impacts—analysed further in this research—play a critical role in achieving sustainable development goals (SDGs), making it, along with other struggling sectors, a true balancing act.

These goals are at the heart of the 2030 Agenda for Sustainable Development, an action plan for people, the planet, and prosperity, signed in September 2015 by the governments of the 193 UN member states. The agenda particularly incorporates 17 Sustainable Development Goals (SDGs) within a broad action plan encompassing 169 targets. The official launch of the Sustainable Development Goals coincided with the start of 2016, setting the world on a path to achieve them by 2030. From ending poverty and reducing gender inequality to combating climate change and revitalizing biodiversity, the SDGs recognize that the fight for human rights and the fight for the health of our planet must go hand in hand.

What follows is a summary of how the SDGs relate to today's fashion industry. The data presented highlights key aspects that will be explained and explored in detail in the relevant chapters on the ESG impacts of the fashion industry.

Figure 2 - The Fashion Industry's Impact on Sustainable Development Goals

Most workers in the fashion industry are based in developing countries, where labour laws frequently perpetuate systemic poverty. A mere **4% of the price of a garment reaches those who actually produce it**, and **less than 2% of these workers earn a living wage**.

The fashion industry is said to use **around 93 billion cubic metres of water per year**—enough to meet the needs of 5 million people. In particular, the industry exploits **4% of the world's potable water just for garment production**. Additionally, another 20 billion cubic meters of water are used annually for post-purchase care, while an astonishing six to nine trillion litres of water are consumed each year solely for dyeing processes.

The fashion industry is responsible for **10% of global carbon emissions**, releasing an estimated 4-5 billion tons of CO_2 into the atmosphere annually. This amount exceeds the combined emissions from all international flights and maritime shipping and is comparable to the total GHG emissions of the entire European Union. If current practices persist, these emissions will experience a further **increase of 60% by 2030**, highlighting the critical need for significant changes within the industry to reduce its environmental footprint.

A significant portion of biodiversity loss occurs due to habitat changes resulting from agriculture and extensive livestock farming. It is anticipated that the **fashion industry will require 35% more land for cotton, forest for cellulosic fibres, and grassland for livestock**—over 115 million hectares in total. This will cause soil degradation, erosion and disruption of natural community dynamics, as well as an increase in pollution and health impacts due to the high use of insecticides and pesticides.

Globally, **80% of textile workers are women**, particularly in the lower tiers of the production chain. Many of these women face exploitation, discrimination due to pregnancy, verbal and physical abuse, unsafe working conditions, and low wages. In contrast, at the managerial level, the situation is reversed—men dominate leadership positions and receive higher pay. In fact, **only 14% of major fashion brands are led by women.**

Each year, out of the 100 billion garments produced globally, 92 million tonnes become textile waste. Without significant changes, global textile waste is expected to reach 134 million tonnes by 2030. Currently, **about 82% of discarded textiles are landfilled or incinerated**, and **less than 1% are recycled into new fabrics**. This highlights the urgent need to step back from excessive clothing production and rethink business models towards a circular approach.

It is estimated that the textile industry is responsible for **20% of global industrial water pollution** due to processes like dyeing and finishing. Washing garments made from synthetic fibres contributes to an **annual accumulation of half a million tons of microplastics on ocean floors**, equivalent to 50 billion plastic bottles. These particles can infiltrate the food chain, causing intestinal blockages, physical injuries, altered feeding behaviour, and reduced energy levels, which can negatively impact the growth and reproduction of marine life.

Source: FdER, Come gli SDGs delle Nazioni Unite si relazionano all'Industria della Moda

2. ESG frameworks and their application

In a context of increasing attention to sustainability issues on organizational agendas, the textile sector is undergoing a significant transformation. This industry, historically associated with excessive consumption and waste, is now facing the challenge of addressing its environmental, social, and governance impacts. Fashion houses are being called upon to shift towards responsible and circular production models, reflecting a broader commitment to sustainability.

The push for change is driven by a variety of factors, including heightened consumer awareness, regulatory pressures, and the urgent need to mitigate the environmental footprint of textile manufacturing. Companies are being encouraged to adopt practices that reduce waste, enhance resource efficiency, and promote the use of sustainable materials. The shift towards a circular economy, where products are designed for reuse, recycling, and minimal environmental impact, is gaining momentum as a viable solution to the industry's longstanding issues.

Sustainability reporting

First, the introduction of the Corporate Sustainability Reporting Directive (CSRD) marks a significant turning point in sustainability reporting in Europe. The current heterogeneity and fragmentation in the communication approaches of various brands have hindered the ability of consumers and investors to effectively compare sustainability reports, compromising the perception of their positioning and maturity levels. The CSRD aims to address these issues by implementing a standardised regulatory framework that harmonises the collection and communication of Environmental, Social, and Governance information across the European Union.

Providing a comprehensive and timely view of their activities, initiatives, and sustainability strategies not only strengthens the trust of external stakeholders but also enhances the sharing

of the organization's intrinsic values with its employees, thereby fostering a sense of belonging and responsibility.

In parallel, the recent adoption of the Corporate Sustainability Due Diligence Directive (CSDDD) proposal represents significant progress toward transparent management of environmental and human rights aspects throughout the entire production cycle. Full awareness of the impacts deriving from the supply chain is particularly challenging in sectors like the textile, where tracking and monitoring activities are complicated by the extensive presence of organizations and the vast scale of operations. The directive requires companies to conduct thorough assessments of supply chain actors, increasing corporate knowledge of their activities' ecological footprint while ensuring respect for workers' fundamental rights.

EU strategy for sustainable and circular textiles

By 2030, the Commission envisions a future where all textiles in the EU market are durable, repairable, and recyclable, predominantly crafted from recycled fibres, devoid of harmful substances, and manufactured in compliance with social and environmental standards. A strategy which aims to transition away from "fast fashion," enabling consumers to enjoy high-quality, affordable textiles for longer periods. Further, the Commission aspires for the widespread availability of profitable reuse and repair services, fostering a competitive, resilient, and innovative textile industry where producers assume responsibility for their products throughout the value chain, with ample recycling capacities and reduced incineration and landfilling.

To achieve the objectives, the strategy unfolds through various regulations and directives that will progressively address the sector's legislative gaps, constructing a comprehensive legal framework.

Sustainable product design

The European Union's proposal for the Ecodesign for Sustainable Products Regulation (ESPR) represents a significant acknowledgment that products are often designed to satisfy fleeting style whims, only to quickly disappear from circulation.

Set for full implementation by 2025, the ESPR introduces specific design requirements aimed at improving the circularity, energy efficiency, and overall environmental impact of a wide array of products, including textiles (garments and footwear). Among the main aspects encompassed are to extend the lifespan of products, making them more durable and easier to reuse and repair, and the importance of incorporating recycled materials into the manufacturing process.
This approach not only reduces the demand for virgin resources but also helps minimise waste, aligning with the broader goals of the 2020 Circular Economy Action Plan[4].
Additionally, the ESPR mandates that manufacturing and recycling processes be optimized for energy efficiency and lower emissions, thereby measuring the carbon footprint of products from creation to disposal.

To ensure compliance with these rigorous standards, the ESPR introduces innovative measures, one of which is the Digital Product Passport (DPP). This digital identity card will contain essential information about a product, including details about its components, materials, and sustainability credentials. By storing this information electronically, the DPP will facilitate better decision-making for consumers, manufacturers, and regulatory bodies alike. Consumers, by means of QR codes, RFID tags, or similar, will have access to transparent information that can guide their purchasing choices towards more sustainable options. For manufacturers, the DPP will help track compliance with sustainability criteria, while authorities can use it to verify the authenticity of imported products and ensure they meet EU standards.

[4] It is one of the main building blocks of the European Green Deal, Europe's agenda for sustainable growth.

Another groundbreaking measure introduced by the ESPR is the ban on the destruction of unsold textiles and footwear. This measure aims to curtail the significant environmental impact of discarding excess inventory—a practice that has become all too common in the fast fashion business model, where rapid production cycles often lead to surplus goods.

By prohibiting the disposal of unsold products, the ESPR compels companies to rethink their inventory and production strategies. Businesses will be required to develop innovative approaches to ensure that all products, including those returned or unsold, find their way into the market rather than ending up as waste.

This ban acts as both a safeguard and an incentive for the adoption of the design criteria it sets forth. By eliminating the option to simply discard surplus goods, it encourages companies to be more prudent in their production planning and rethink their business models. For example, they can extend their value proposition beyond mere product sales by implementing take-back schemes to recover consumer waste, allowing them to regenerate materials, when possible, recycle for use in other products, or repair and resell items. Incentivizing consumers with promotions or discounts on new products when they return their dead stock can create new revenue streams while also enhancing customer loyalty.

Waste management, shipment and disposal

The textile industry ranks as the fourth most resource-intensive sector yet is facing the major difficulties to comply with the core management principles outlined in the EU's current Waste Framework Directive[5].

The directive, published in 2008, defined a waste hierarchy to be intended as an order of prioritisation in waste management. It begins with the optimal choice, prevention, and descends to the least desirable option: disposal. The primary goals were to achieve re-use and recycling of at least 50% of household waste and 70% of non-hazardous construction and demolition waste by 2020.

[5] Directive 2008/98/EC.

Current data has shown that less than 1% of fashion textiles are regenerated[6], while an *estimated 82% ends up being landfilled or incinerated.*

Directive (EU) 2018/851[7] has drawn the target for Member States to set up separate collection for textiles by January 1st, 2025[8], supported by the ban proposal related to the destruction of unsold garments (previously seen in the ESPR).
Compliance with these requirements calls for substantial investments in infrastructure development and the advancement of innovative technological solutions.

These are the main reasons behind the recent proposal of amendment to the Waste Framework Directive: to assign specific objectives tailored to the struggling textile manufacturers and consumers, whose waste collection and recycling practices are far from being sustainable.
Moreover, the revised Directive proposes to implement obligatory and standardised Extended Producer Responsibility (EPR) programs for textiles across all the EU.
EPR was first implemented in France in 2007 for clothing and subsequently extended to home textiles in 2020. Companies are obliged to either establish a recycling and waste management system for the products they sell or pay a contribution (based on the amount produced and the level of pollution) to an organisation that will financially support third parties to manage their waste.[9]
The aim is obliging producers to assume the responsibility for their products' entire lifecycle, particularly at the end-of-life stage.
This includes, among the activities related to its disposal, the realm of logistics and exportation of waste abroad.

When waste is transported across borders, it can pose threats to both human health and the environment, particularly if not adequately managed. Concurrently, the Critical Raw Materials

[6] 'Can clothes ever be fully recycled?', BBC.
[7] Amending Directive 2008/98/EC.
[8] Directive (EU) 2018/851, Article 11.
[9] Legifrance, Code de l'environnement: Article L541-10-3.

Action Plan has underlined that these wastes often hold economic value, serving as secondary raw materials that can substitute the extraction of natural resources and promote a more circular economy.

The Waste Shipment Regulation (WSR) mandates Member States to ensure that waste shipments and their treatment procedures are conducted in a manner that safeguards the environment and human health from any potential adverse impacts. It outlines strict control measures for the import and export of waste between the EU and third countries, as well as transportations among Member States. These controls vary depending on the nature of the waste, its intended destination, and whether it will undergo recovery (e.g., recycling) or disposal (e.g., landfilling) operations.

Finally, the WSR includes restrictions on exporting specific categories of waste to certain transboundary destinations. A notable example is the prohibition on exporting hazardous waste from the EU to non-OECD countries.

Responsible Marketing

Nowadays, navigating through the myriad of labels related to the sustainable performance of products and companies represents a challenge for consumers. Many assertions lack reliability, leading to a significant erosion of consumers' confidence. This unresponsible marketing activity weaves the web to potential deception, where companies misrepresent their environmental impacts or benefits.
To combat this phenomenon, commonly referred to as greenwashing, the EU is proposing a new Green Claims Directive, aimed at curbing misleading sustainability advertising practices and safeguarding both consumers and the environment.

Requiring precise, science-based, and independently verified sustainability statements will allow to make more informed purchasing choices and prevent companies from capitalizing on

unproven or inaccurate statements that may deceive consumers into purchasing their products. Furthermore, it will enhance the competitiveness of businesses committed to achieving disruptive sustainable solutions for their products and operations.

In parallel, new comprehensive labelling requirements are currently in phase of evaluation with the amendment proposal of the current EU Textile Labelling Regulation. The aim is to provide consumers with precise, understandable, and comparable information in both the physical and digital labelling of textile products.

Figure 3 - Sustainability framework governing the Textile Industry

Legislation	Objectives and actions	Status
Corporate Sustainability Reporting Directive	Updates and enhances reporting rules[10] on social and environmental aspects, with the aim of providing investors and stakeholders with essential information to evaluate companies' impact on people and the environment, as well as addressing financial risks and opportunities related to sustainability.	Adopted in November 2022
Corporate Sustainability Due Diligence Directive	Envisages transparency in the management of human rights and environmental aspects throughout the entire process of production and distribution, by requiring specific companies to conduct assessments on their supply chain.	Adopted in May 2024
EU Strategy for Sustainable and Circular Textiles	The strategy, oriented to year 2030, is to achieve an EU market whose textile value proposition is fully composed by durable, repairable, and recyclable products, obtained without harming people's fundamental rights and the environment. It was outlined to support the commitments drawn in the European Green Deal, the Circular Economy Action Plan, and the European Industrial Strategy, by enhancing the legislations reported below.	
Waste Framework Directive revision	Amending Directive 2008/98/EC[11], the directive fosters substantial investments in infrastructure and research and development of new technological solutions for improving collection, sorting, reuse, and recycling capabilities in the textile industry. Concurrently, the Commission proposes the implementation and standardisation of mandatory Extended Producer Responsibility (EPR)[12] schemes for textiles across all EU countries.	Adopted in March 2024
Ecodesign for Sustainable Products Regulation	This proposal extends beyond the current Ecodesign Directive[13], setting ecological design and circularity requirements to be observed in the production process of a wide array of goods, with the support of the Digital Product Passport to enhance transparency.	Adopted in April 2024
Green Claims Directive	Strives to guarantee that consumers receive sufficient, science-based, and verifiable information regarding the durability and repairability of products prior to making a purchase. It seeks to enhance consumer protection by guarding against unreliable or misleading environmental assertions.	Proposal adopted in March 2023
Waste Shipment Regulation	Provides clearer legal guidelines and standardisation in waste transportation across the borders, while preventing the export of waste issues to third countries.	Adopted in April 2024
Textile Labelling Regulation	The Commission is set to amend the Textile Labelling Regulation[14] to corporate guidelines for both physical and digital labelling of textiles.	Drafted
Microplastic Legislation	Provide measures to regulate intentional microplastic additives in products, with the aim of preventing half a million tonnes of synthetic polymer particles from being released into the environment.	Drafted

[10] The rules will be implemented for the first time in the financial year 2024, hence regarding reports published in 2025. Companies subject to the CSRD must disclose the information in compliance with the European Sustainability Reporting Standards (ESRS), developed by the independent EFRAG (European Financial Reporting Advisory Group) and published with the first set in December 2023.

[11] Directive 2008/98/EC was published in November 2008 to set waste management principles and establish an order of preference for disposal. The present Directive provides a focus on food and textiles, the first and the fourth most resource intensive sectors, consequently to their issues in adhering to the waste hierarchy.

[12] EPR schemes assign to manufacturers the responsibility for their products throughout their entire life cycle, especially during the phase of disposal.

[13] The current directive was published in October 2009 to establish a framework for the setting of ecodesign requirements for energy-related products.

[14] Regulation (EU) 1007/2011 sets out guidelines for labelling and naming textile fibre products. It requires importers and manufacturers to disclose the fibre composition of their textile products (e.g., 100% cotton) and indicate if the product includes non-textile components of animal origin.

3. The environmental footprint

The environmental footprint of the fashion industry must be examined holistically, from the extraction of raw materials to production and, ultimately, disposal. The cultivation of natural fibres like cotton, hemp, and linen relies on vast amounts of land and water, while also using fertilizers and pesticides that negatively affect ecosystems and biodiversity. In contrast, synthetic fibres such as polyester, nylon and elastane, derived from fossil fuels, are energy-intensive to produce and involve harmful chemicals. The distribution and retail stages contribute to carbon emissions from transportation and generate significant packaging waste. During the consumer phase, washing, drying, and ironing garments consume electricity, water, and detergents, releasing microfibres and chemicals into wastewater. To conclude their life cycle, textiles often become waste, with most being incinerated or landfilled, further intensifying the industry's environmental impact.

3.1 Water consumption and contamination

The textile industry is a significant consumer of water resources worldwide. In 2017, the Ellen MacArthur Foundation's report *"A New Textiles Economy: Redesigning Fashion's Future"* estimated that the global textile and apparel industry was using 93 billion cubic meters of water per year—an amount that could meet the needs of 5 million people. This figure, which is expected to double by 2030, is particularly stark when compared to the entire water consumption of the European Union economy, which amounted to 266 billion cubic meters in the same year[15].

However, the problem extends beyond sheer volume. The textile and apparel sector is also a leading source of pollution, contributing to an estimated 20% of global industrial water contamination[16]. This pollution stems from various processes involved in production, particularly dyeing and finishing, which release harmful chemicals and untreated wastewater into the marine

[15] ESG360 (2023) *L'impatto invisibile dell'industria tessile, l'UE si mobilita per la moda circolare*
[16] Parlamento Europeo (2024) *L'impatto della produzione e dei rifiuti tessili sull'ambiente*

ecosystem. Synthetic garments exacerbate this issue; washing these clothes contributes to an annual accumulation of half a million tons of microplastics on ocean floors, equivalent to 50 billion plastic bottles[17]. A single load of polyester laundry can release 700,000 microfibres[18], which can infiltrate the food chain and cause devastating impacts on the health of people, animals, and ecosystems near textile factories. Fast fashion, with its business model based on mass production at low prices, leads to high sales volumes and numerous first washes, during which most of this microplastic release occurs.

Dyeing processes are particularly water-intensive, consuming between six and nine trillion litres of water annually, with three-quarters of this volume becoming wastewater[18]. The primary issue is not merely the wastewater itself but the difficulty in controlling the treatment of these effluents in certain geographic regions, which often results in significant water pollution. Different chemicals used in the dyeing factories of several areas, such as India, are actually banned in Europe, creating a dilemma for consumers of imported garments. Moreover, even where regulations exist, manufacturers often discharge wastewater illegally, especially in countries with weak labour and environmental laws such as China, Bangladesh, India, and Turkey. These countries are indeed major production hubs for fast fashion giants.

A detailed report by the Sustainable Europe Research Institute (SERI), commissioned by Friends of the Earth Europe, underscores the immense water footprint of the textile industry. On average, producing a single cotton t-shirt requires 2,700 litres of water from cultivation to consumer delivery, roughly the amount a person would drink over two and a half years. The water footprint of a pair of jeans is even higher, at 7,500 litres, while leather shoes require around 8,000 litres[19].

Natural fibres, in particular, present the most alarming levels, stemming not only from the cultivation of raw materials but also from subsequent processing stages. On average, producing

[17] Maiti R. (2024) *Fast Fashion and Its Environmental Impact*
[18] Comistra (2024) *Water pollution in the fashion industry*
[19] Sustainable Europe Research Institute (2011) *Quant'acqua sfruttiamo*

one kilogram of cotton textile requires about 11,000 litres of water, with only 45% of this volume used for irrigation[20]. Once harvested, it is transported to mills for weaving and dyeing, adding to the water used in cultivation.

Uzbekistan exemplifies the economic dependence on cotton, being the world's sixth-largest producer despite ranking 56th in land area. Producing one million tons of cotton annually, or 50 kilograms per capita, Uzbekistan is second only to the United States in cotton exports[21].
However, this economic development has severe environmental repercussions, most notably the desiccation of the Aral Sea. Intensive farming required extensive use of herbicides, polluting the surrounding soil and water. The lake, having no outflow, accumulated toxic substances at its bottom, and as the water evaporated, only sand mixed with toxic dust remained.
The economic collapse of fishing industries in the Aral region had profound social impacts on families dependent on these activities. Furthermore, the draining of the Aral Sea altered the local climate. Previously, water moderated the hot temperatures, but its absence has accelerated evaporation rates, leading to significant temperature fluctuations and increased aridity.

In conclusion, the textile and clothing industry's environmental impact on water resources is profound and multifaceted, involving enormous water consumption, significant pollution, and severe local and global consequences. Addressing these issues requires concerted efforts in sustainable practices, stringent regulations, and global cooperation.

3.2 Greenhous gas emissions

A second catastrophic contribution of the sector to the global environmental footprint regards greenhouse gas emissions, with fashion production alone accounting for 10% of total worldwide carbon emissions[22]. This percentage, equivalent to 4-5 billion tons of CO2 released into the

[20] Alperia (2023) *Acqua. L'insostenibile impronta idrica del fast-fashion*
[21] Dress The Change (2021) *Il consumo dell'acqua nell'industri della moda*
[22] Maiti R. (2024) *Fast Fashion and Its Environmental Impact*

atmosphere each year, is greater than the combined total of all international flights and maritime shipping, and on par with the entire European Union's GHG emissions[23].

According to the UN Framework Convention on Climate Change, this concerning statistic is projected to skyrocket by 60% within 2030. A trajectory that would place the fashion industry far from achieving the necessary reductions to keep global warming within 1.5°C above pre-industrial levels, as stipulated by the Intergovernmental Panel on Climate Change (IPCC) in their "Special Report on Global Warming of 1.5°C" (SR15).

3.3 Dressing for dumping: the waste crisis

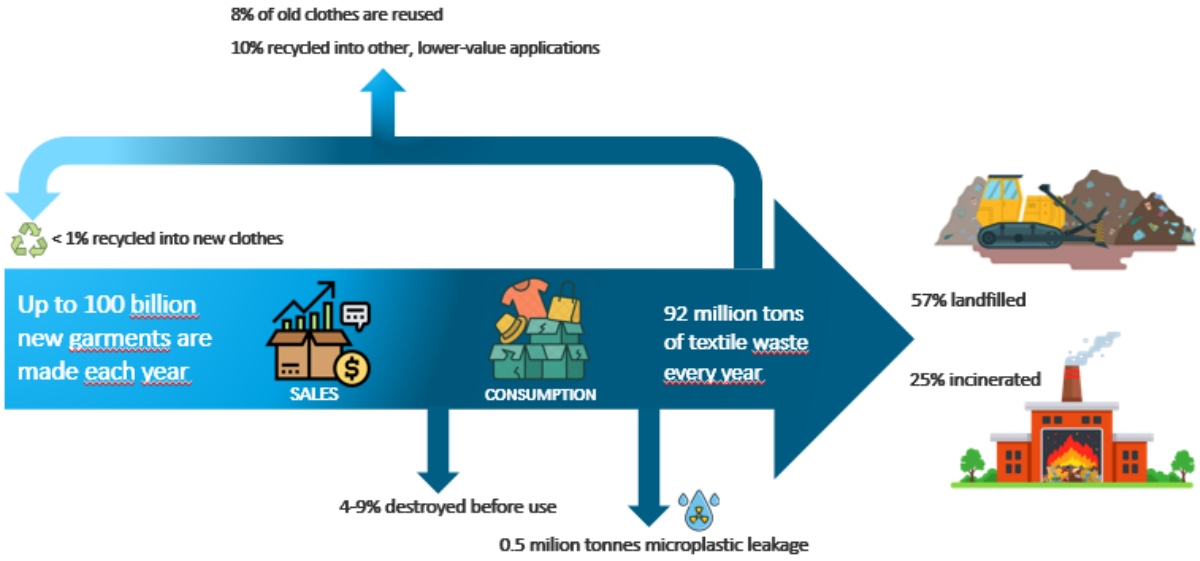
Each year, out of the 100 billion garments produced worldwide, a staggering 92 million tonnes end up as textile waste. Without significant changes in the way clothing is produced, used, and disposed of, global textile waste is projected to reach 134 million tonnes by 2030[24]. The relentless cycle of fashion trends drives excessive production and consumption, with growing demand for quickly made, low-cost garments fostering a 'disposable and throwaway' mass culture. These inexpensive items entice consumers to buy, wear a few times, and then discard them without hesitation.

Indeed, while the production has doubled between 2000 and 2015, the average lifespan of garments has decreased by 36%. This trend drastically shortens the life cycle of textile products, which are often made with questionable quality and limited durability. It is generally cheaper and easier to replace these items than to repair them, with many of today's clothes lasting fewer than 160 uses[25]. This model of production, designed to meet the demand for weekly wardrobe updates, results in 82% of unsold or out-of-fashion clothing being incinerated, further contributing to the fashion industry's share of 10% of global greenhouse gas emissions, or

[23] De Ceglia V. (2023) *L'industria della moda e la sfida globale contro il climate change*
[24] Chen X., Memon H.A., Wang Y., Marriam I., Tebyetekerwa M. (2021) *Circular Economy and Sustainability of the Clothing and Textile Industry*
[25] Chiavacci I. (2022) *La sovrapproduzione è il problema più grande della moda*

dumped in landfills. And by landfills, we shouldn't imagine regulated waste disposal sites. Each year, approximately 59,000 tonnes of clothing[26]—manufactured in countries such as China and Bangladesh and distributed in Europe and the United States—are disposed of in an illegal open-air landfill so vast it is visible from space. This landfill is located on the outskirts of Alto Hospicio, a city of 130,000 people on the western edge of the Atacama Desert in northern Chile. Similarly, in Ghana, the Kantamanto market in Accra, one of the world's largest second-hand clothing markets, receives 15 million discarded garments from the Global North every week. Of these, only 60% are deemed reusable. The remaining 40%, due to their poor quality, are either dumped into the Gulf of Guinea, incinerated in slums—releasing harmful toxins into the atmosphere—or piled up in open-air landfills, causing extensive damage to local marine and terrestrial ecosystems, and posing serious health risks to the surrounding communities[27].

Figure 4 - From Garment Production to Waste: The Lifecycle of Fast Fashion



Sources: Fashion Waste Facts and Statistics, businesswaste.co.uk
Ellen MacArthur Foundation, A New Textiles economy: Redesigning Fashion's Future, p. 20

[26] Il Post (2023) *La "fast fashion" di mezzo mondo finisce in questa discarica in Cile*
[27] Ambiente Mare Italia (2023) *Montagne di vestiti usati sommergono il Ghana*

Less than 1% of all textile waste from both pre- and post-consumer stages is currently recycled, in a closed loop[28], into new fabrics.

In response to this tragic situation, the European Union has made textile waste management a key focus of its circular economy strategy, recognizing the critical role the textile sector represents in the ecological transition. As part of the European Commission's New Deal, member states are required to implement separate collection of textile waste by January 1, 2025, under the circular economy directives.

What complicates these efforts and the path to compliance is the fact that 70% of the fibres in these garments are synthetic, particularly polyester, which is not biodegradable, unlike natural fibres, making recycling practices more challenging. Technological investments and partnerships are essential to address this growing waste crisis. Public awareness and consumer behaviour also play a crucial role. Educating consumers on the environmental impact of their clothing choices and encouraging sustainable consumption can help shift demand towards more eco-friendly options. Initiatives like clothing donation, resale, and upcycling can extend the life of garments and significantly reduce the volume of waste.

3.4 Biodiversity loss and land abuse

The fashion industry's impact on biodiversity has become another critical area of concern, highlighted by recent analyses and collaborative efforts aimed at addressing these challenges. Textile Exchange, in partnership with the Fashion Pact[29], Conservation International, and with support from Biodiversify, published the "Biodiversity Landscape Analysis." This report provides a centralised reference on the current state of biodiversity, offering detailed insights into existing tools, methods, frameworks, and standards.

[28] Closed-loop recycling refers to a process where the material obtained from recycling is more or less identical to the original and can be reintegrated into the same family of products.
[29] The Fashion Pact is a voluntary agreement signed by leading global fashion companies, including the Prada Group, Gucci, Chanel, Adidas, and many others. This initiative demonstrates a collective commitment to mitigating the environmental impacts of the fashion industry, particularly regarding biodiversity.

The report identifies several specific stages of raw material production that significantly impact biodiversity.

First, extensive grazing, intended as the exploitation of natural and seminatural grasslands for livestock farming and consequent production of animal fibres, can severely affect ecosystems especially when land management is inadequate. Main impacts include soil conversion, habitat fragmentation, soil degradation, erosion, introduction of invasive species, competition between livestock and wildlife, and disruption of natural community dynamics.
According to some estimates, extensive grazing is practiced on 25% of the Earth's land surface[30], for multiple production schemes and businesses. Although there is greater attention to animal health in extensive farming when compared to intensive, for instance in terms of nutrition, shelter, grazing, and exploitation, several unethical practices are still in use. One example is the practice of mulesing in sheep farms producing Merino wool. This involves removing part of the sheep's posterior tissues, often including the tail, to ensure that the new tissues that form are smoother and free of folds and crevices where infections can settle.
While it is true that infections such as myiasis, which is common in sheep, can lead to the animal's death, it is also true that mulesing causes deep wounds, and the resulting blood loss can sometimes be fatal. Further, these wounds often become infected, leading back to the original problem. The practice of mulesing has been made illegal in many countries, but it is still allowed in Australia, where, according to the organization PETA (People for the Ethical Treatment of Animals), 25% of the world's Merino wool production is concentrated[31].

In parallel, agricultural exploitation for the cultivation of plant fibres presents similar concerns, especially for crops like cotton and hemp. Beyond the conversion of natural ecosystems into cultivated lands, which leads to habitat loss and fragmentation, the impacts of intensive ploughing and the use of chemical fertilizers in soil management are even more alarming. These practices reduce the soil's capacity to retain water, leading to erosion. It is estimated that

[30] WWF alle Nazioni Unite (2021) *L 'allevamento estensivo come strategia di conservazione della biodiversità*
[31] Poratelli F. (2022) *Tessuti naturali, artificiali e sintetici: in cosa differiscono?*

conventional cotton cultivation alone uses about 16% of the world's insecticides and 7% of its pesticides[31]. Crop production affects the biological complexity of the soil, influencing nutrient cycling and pest regulation. Pollution from fertilizers and pesticides threatens water quality and aquatic ecosystems, with significant effects on the health of local populations.

Finally, artificial cellulosic fibres, obtained from wood pulp, such as viscose and lyocell, pose biodiversity risks related to forest management practices. These activities result in deforestation, conversion into plantations, and degradation of the flora and fauna that inhabit these areas.

While most of the textile industry's biodiversity impacts occur during raw material production and the early stages of the upstream value chain, it is crucial to consider the impacts along the whole life cycle of textile products.
Key examples include, as previously observed, pollution from dyeing and textile treatment processes, leather tanning, and energy use during production. The consumer use phase involves microfibre release, waterway pollution, and water and energy use during washing.

4. Behind the seams: the price of social injustice

While the environmental consequences of the fashion industry have become a focal point of public discourse, the social impacts remain tragically overlooked. Behind the scenes, the industry is often responsible for significant human rights violations, particularly in the form of labour exploitation in developing countries where regulations are lax or poorly enforced.
Workers, who are primarily located in these regions, endure extremely low wages and are subjected to hazardous working conditions. Fast fashion, driven by the relentless pursuit of low prices and rapid production cycles, is notoriously associated with labour abuses, including child labour, forced labour, and even human trafficking.

The ruthless drive for cheaper production has precipitated a "race to the bottom," where workers' rights are often disregarded, and their well-being sacrificed for the sake of profit. This

issue is not only a labour concern but also intersects with broader social justice issues such as gender inequality and poverty. Women, who make up the majority of the low-wage garment workforce, are particularly vulnerable to the exploitative practices prevalent in the fashion industry.

4.1 Fair wages vs living wages

Less than 2% of the workers in the fashion industry earn a living wage[32], leaving an estimated 98% trapped in systemic poverty, unable to meet their most basic needs. This issue primarily affects women, who make up 75% of the workforce in this sector, most of them aged between 18 and 24. The scale of this problem is enormous, with the fashion industry employing 75 million factory workers globally—more than the population of over 220 countries[33].
This is not a new issue; the problem of insufficient wages and the resulting generational poverty has been known for decades, yet little has been done to address it. According to the Clean Clothes Campaign[34], 85% of large fast fashion brands acknowledged in a 2014 study that wages should be sufficient to meet workers' basic needs. However, by 2019, none of these brands could prove that workers outside their corporate headquarters were receiving a living wage. Moreover, there were no clear, time-bound plans to ensure that a living wage would be paid within their supplier networks.

Fashion brands often deflect responsibility by claiming they pay "the legal minimum wage," ignoring the fact that in most of the nations where their production facilities are located, these minimums fall far short of a living wage. In Asian countries, responsible for more than 70% of textile and clothing imports in the EU[35], these legal minimums amount to only between one-half

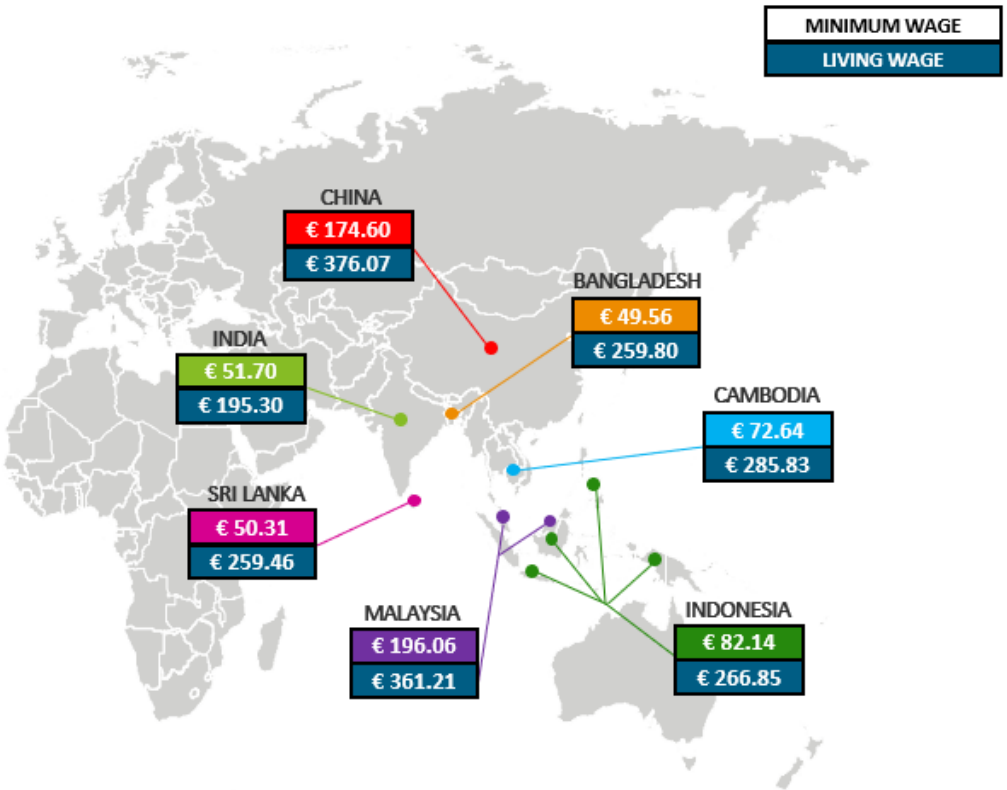
[32] A living wage represents the bare minimum that a family requires to fulfil its basic needs (food, rent, healthcare, education, etc).
[33] The lowest wage challenge (2019) *State of the Industry: Lowest Wages to Living Wages*
[34] Clean Clothes Campaign is an alliance of organisations in 16 European countries. Established in 1989, its members include trade unions and NGOs. Its mission is improving working conditions and supporting the empowerment of workers in the global garment and sportswear industries. (HQ in Amsterdam)
[35] European Parliament (2014) *Workers' conditions in the textile and clothing sector: just an Asian affair?*

and one-fifth of what is needed for a worker and their family to actually sustain a decent standard of living.

Some brands argue that paying a living wage is too costly, but studies show it would only require an additional 1-4% per garment to ensure fair wages across the supply chain[33]. Moreover, fashion houses often shift the blame onto the factories that produce their textiles, even though they use their purchasing power to demand extremely low prices. Factories, aware of the constant threat of losing business, are pressured to keep wages down, knowing that when labour costs rise in one country, these companies simply relocate to another, perpetuating a cycle of exploitation.

This relentless focus on minimizing labour costs has devastating consequences for the workers who create clothes, trapping them in a cycle of poverty with little hope for a better future.

Figure 5 – Minimum Wage vs Living Wage



Source: Clean Clothes Campaign

4.2 Inhumane working conditions: the wake-up call from Rana Plaza

On April 24th, 2013, the fashion industry witnessed its deadliest tragedy: the collapse of the Rana Plaza building in Dhaka, Bangladesh, which claimed the lives of 1,138 garment workers[36]. According to the Clean Clothes Campaign, the high death toll was not only due to a lack of safety measures but also to low wages and the absence of union representation. These factors exerted indirect coercion on workers, forcing them to enter the factories despite the high risk of collapse.

While the shops on the ground floor remained empty that day, the factories refused to halt operations and compelled workers to enter under the threat of withholding their wages. Struggling to survive on starvation pay and without a union to collectively defend their rights, most of them felt they had no choice but to comply.

This tragic event exposed the unacceptable working conditions prevalent across the fashion industry. Employees often work in unsafe buildings with no ventilation, where they are forced to breathe in toxic substances, inhale fibre dust, or handle hazardous materials like blasted sand. Accidents, fires, injuries, and diseases are all too common in textile production sites.

Additionally, garment workers regularly endure verbal and physical abuse. In many cases, when they fail to meet their nearly impossible daily targets, they are insulted, denied breaks, or not allowed to drink water. This relentless pressure to meet production goals, coupled with inhumane working conditions, underscores the severe exploitation that continues to plague the fashion industry.

The tragedy of Rana Plaza highlighted the urgent need for more stringent oversight and accountability in the fashion industry. This is why the passing of the Corporate Sustainability Due Diligence Directive (CSDDD) has been so significant. The CSDDD represents a crucial

[36] Siccardo A. (2024) *RanaPlaza, 11 anni dopo. In Bangladesh persistono le cause della tragedia*

advancement in regulating corporate practices, as it mandates that companies conduct comprehensive due diligence throughout their entire supply chains, including indirect suppliers. This means that they could be held accountable for labour rights violations occurring anywhere within their production networks. Although the legislation will initially target only the largest firms operating within the EU, it marks a substantial move towards making brands responsible for their global value chains. The CSDDD aims to prevent future tragedies by enforcing stricter standards and ensuring that companies actively work to ensure the respect of workers' rights, regardless their geographical location.

4.3 The invisible chains binding women and children

Child labour remains a deeply troubling issue within the fashion industry, particularly in cotton cultivation, where it is both widespread and severe. Globally, an estimated 152 million children aged 5-17 are engaged in child labour, with 71% of these children working in agriculture[37]. Cotton, a key commodity for the fashion industry, is among the most commonly produced goods using child labour and forced labour in at least 18 countries.

Historically, children have been involved at various stages of the cotton supply chain, including cross-pollination, harvesting, and working in spinning, weaving, and dyeing mills. The conditions for young workers in this sector are among the most hazardous. They are often exposed to toxic pesticides and chemicals, endure extreme temperatures, suffer from isolation, and face ongoing threats from insects and other hazards, all of which contribute to serious and lasting health issues.

One of the most alarming examples of child exploitation in the cotton industry occurred in Uzbekistan. Over nearly three decades, from the 1990s until 2020, approximately two million children were subjected to forced labour in the country's cotton fields[38]. This practice was a

[37] International Labour Organization (2017) *40 million in modern slavery and 152 million in child labour around the world*
[38] Gazieva M. (2023) *'It was very secret': Uncovering wounds of forced labour in Uzbek cotton*

continuation of Soviet-era policies, where the Uzbek state, driven by the need to meet state-set cotton production quotas, systematically coerced people in rural areas, including vast numbers of children, into picking cotton. Reports indicate that government workers compelled children to harvest cotton during the summer months, often threatening them with school expulsion if they failed to comply.

The United Nations Convention on the Rights of the Child (CRC) has prohibited child labour, and two key ILO Conventions directly address the issue: ILO Convention 138 on the minimum age for work and ILO Convention 182 on eliminating the worst forms of child labour. Additionally, the international community has established SDG target 8.7, which aims to end child labour in all its forms by 2025.

Thanks to sustained international pressure and advocacy, Uzbekistan was able to eradicate forced and child labour in its cotton industry by 2022, as officially declared by the International Labour Organization (ILO). However, this dark chapter underscores the immense challenges that remain in the fight to eliminate such exploitation from global supply chains. The progress made in Uzbekistan is significant, yet it serves as a reminder of the ongoing efforts needed to ensure that all industries, especially those as complex and far-reaching as fashion, are free from the scourge of child and forced labour.

Nevertheless, the exploitation of vulnerable groups within the fashion industry extends beyond child labour, to include the systematic abuse of women, who are often used as a low-cost labour force. In Southern India, this issue is particularly alarming. Here, young girls from impoverished backgrounds are frequently coerced into working under conditions that closely resemble bonded labour. In some extreme cases, there have been reports of girls being administered hormones to prevent menstruation, as their menstrual cycles were seen as a hindrance to productivity.

Women, who constitute a significant majority of the workforce in the garment industry, are often confined to the lowest tiers of textile production. This not only exposes them to greater occupational hazards but also to the harmful chemicals used in textile processing. According to

the United Nations Environment Programme (UNEP), women working in this sector face elevated risks of serious health problems, including breast cancer and reproductive issues, due to their exposure to endocrine-disrupting chemicals during wet processing.

The relentless pursuit of lower production costs, fuelled by the fast fashion industry, has only worsened these conditions. As UNICEF points out, fast fashion has initiated a "race to the bottom," pressuring companies to seek ever-cheaper labour sources, which in turn increases the prevalence of exploitation. Many of the countries that dominate textile and garment production offer inexpensive labour, making women and children particularly vulnerable to exploitation.

Moreover, the extent of this exploitation is often concealed from the public eye. The 2021 Fashion Transparency Index revealed that a mere 11% of brands disclose their raw material suppliers, raising concerns that consumers may unknowingly support exploitative practices within the supply chain. This data further highlights the role of the CSDDD, in order to address these information asymmetries between brands and consumers, bringing to light instances of child and women forced labour, and uphold workers' rights across global value chains.

5. Governance challenges in shaping the future

This chapter delves into the sourcing practices of key fibres in the fashion industry, highlighting the growing reliance on synthetic materials. As the demand for these fibres accelerates, so do the environmental challenges associated with their production, assembly, and end-of-life disposal. Understanding the impact of these materials is crucial for identifying more responsible sourcing practices that can mitigate their environmental footprint.
Central to this transformation is innovation—both in product and process. By exploring sustainable alternatives in fibre extraction or cultivation, and designing garments with waste reduction in mind, the industry has the power to reverse its current course. This represents the "sword in the stone" for brands seeking to truly embrace sustainable fashion. However, it requires significant effort to ensure these shifts do not bring further energy or environmental

burdens. Yet, this pursuit holds tremendous potential, offering not only reputational benefits but also long-term business success. Finally, this chapter will address the growing issue of deceptive marketing practices, stressing the need for transparency. Empowering consumers to make informed, sustainable choices is key to dismantling misleading strategies aimed purely at profit.

5.1 The rising demand for synthetic fibres

To begin with, textile fibres can be typically categorized into two main groups: natural and synthetic. Natural fibres originate from plants and animals, while synthetic fibres are manufactured from either petroleum resources, which is the case of polyester and nylon, or natural sources, such as viscose and lyocell.

Natural fibres such as cotton, wool, and silk offer distinct benefits over synthetic alternatives, including renewability, biodegradability, and a lower likelihood of causing skin abrasions due to their softer texture. They are readily available and often possess superior specific properties, making them a popular choice in the fashion industry. For instance, natural fibres require significantly less energy for production: the polymerization, spinning, and finishing of synthetic fibres like polyester consume between 369 to 432 MJ per kilogram of fibre, whereas cotton production requires only 38 to 46 MJ per kilogram.
However, natural fibres have their own environmental drawbacks, particularly concerning water usage and the application of harmful chemicals. For example, cotton requires substantial amounts of fresh water, approximately 10,000 to 20,000 litres per kilogram, as well as significant use of fertilizers (457 g) and pesticides (16 g) during cultivation. In contrast, synthetic fibres demand far less water; acrylic fibres require only 0.3 to 15 litres per kilogram, while polyester fibres need about 17.2 litres per kilogram.

Figure 6 - Environmental aspects associated with the production of cotton and polyester fibres

Parameters	Cotton	Polyester
Energy consumption	38–46 MJ/kg	369–432 MJ/kg
Water	20,000 L	17.2 L
CO2 emission	3.0 kg	2.3 kg
Oil or gas	–	1.5 kg
Fertilisers	457 g	–
Pesticides	16 g	–

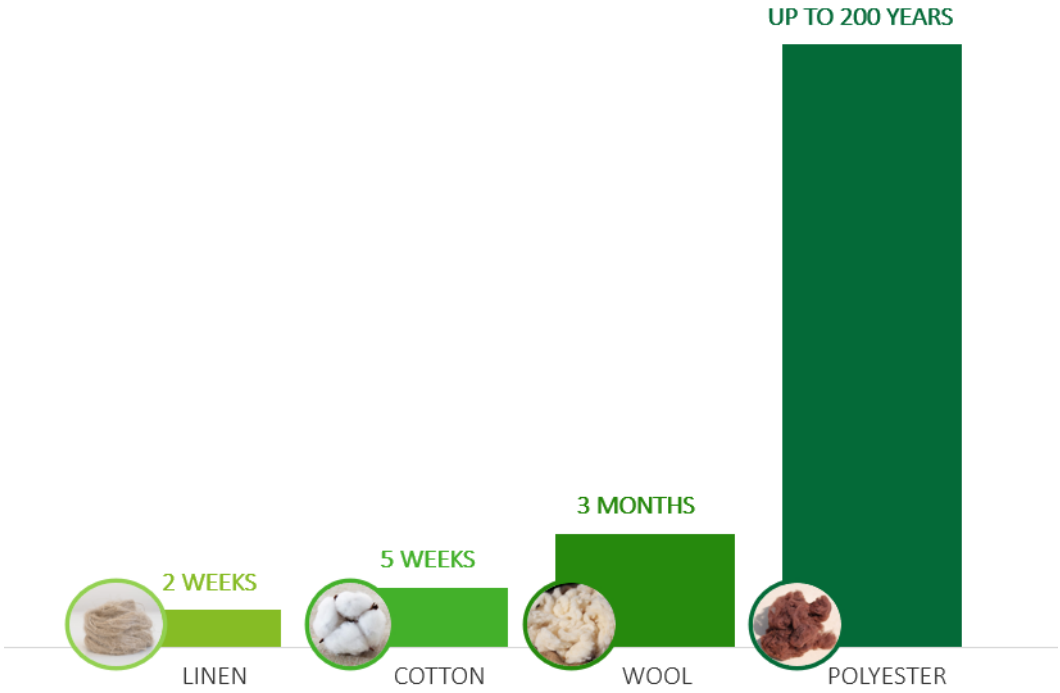
Source: Nayak R., Jajpura L., Khandual A, Traditional fibres for fashion and textiles: Associated problems and future sustainable fibres, p. 6

The main issue that could significantly differentiate synthetic fibres from natural ones, to their detriment, concerns their end-of-life disposal. Synthetic fibres, unlike their counterparties, are non-biodegradable, which complicates waste management and contributes to long-term environmental pollution. These fibres can take centuries to decompose, during which they emit toxic substances and release considerable amounts of microplastics into the ecosystem.

In contrast, natural fibres break down within a few years without causing harm to the environment. Plant-based fibres, which are primarily composed of cellulose, dissolve readily in water, resulting in quicker decomposition times. For example, cotton typically decomposes in about five weeks, while linen and hemp can break down in as little as two weeks—an important advantage for sustainability.

On the other hand, animal-based fibres are shorter and consist of proteins, which generally take longer to decompose due to their increased resistance to water compared to cellulose. Wool usually takes three to four months to break down, while silk can require anywhere from one to four years.

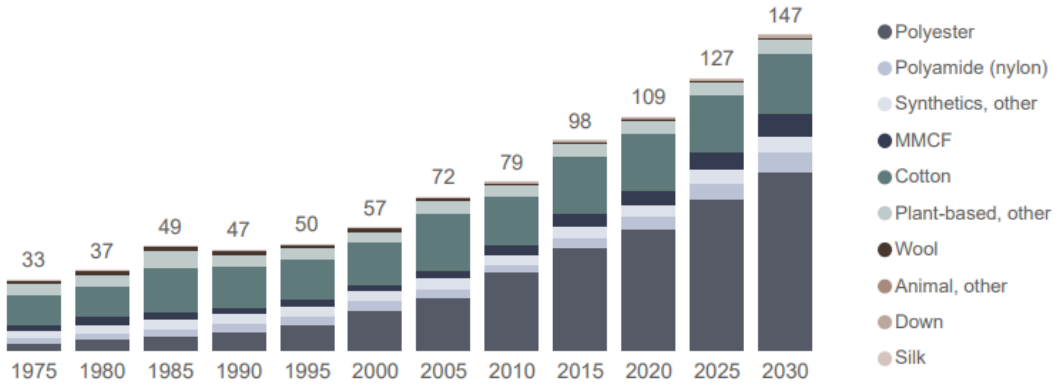
Figure 7 - How Long Fibres Take to Decompose



Source: Artknit Studios

As global fibre production continues to increase, surpassing 109 million tons in 2020 and projected to reach 147 million tons by 2030, the dominance of synthetic fibres is expected to grow. Currently, synthetic fibres make up 70% of the market, with natural and blended fibres comprising the remaining 30%. This trend is anticipated to intensify, potentially leading synthetic textiles to account for over 95% of total fibre production in the coming years, leaving only a marginal share for natural fibres.

Figure 8 – Global fibres production (million ton/nes)



Source: Textile Exchange, Materials Market Report, p. 9

A small reaction to this shift has been observed with the introduction of several alternative synthetic fibres designed to be more environmentally friendly. Regenerated fibres such as Lyocell and Tencel, for example, are considered more sustainable than traditional fibres like polyester, nylon, and acrylic, due to their biodegradability and renewable source of raw materials. Additionally, advances in polymer science have led to the commercial production of fibres made from renewable resources, including soybean protein, bamboo, Lenpur, SeaCell, and polylactic acid (PLA). These fibres are both derived from renewable sources and biodegrade after disposal, offering a potential solution to the recycling challenges posed by conventional synthetic fibres.

Despite these promising developments, the fashion industry's approach to adopting more sustainable fibres has often been more about marketing than actual progress. Many brands have launched "conscious" collections or used certified recycled materials; however, these initiatives frequently lack the scientific backing needed to prove their sustainability. Moreover, there is often no real commitment to transitioning towards more eco-friendly materials, leaving consumers susceptible to deceptive marketing practices. The legislation meant to regulate these claims is often ineffective, as verifying the true sustainability of these "eco-friendly" fibres requires tracing raw materials back through the supply chain—a complex and often unattainable goal in the fashion industry.

5.2 Fashion revolution through sustainable innovation

The answer to combating the effects of overproduction and consumer-driven excess lies in the circular economy, and for an industry like fashion—still at the early stages of this transition, as evidenced by the low percentages of recovered and recycled waste—innovation is the key. It is imperative to decouple economic growth from the consumption of natural resources and waste generation. Achieving this requires three primary strategies.

1. Reducing Waste and Extending Product Lifespan

   The first approach focuses on minimizing the waste of both material and energy resources while extending the lifespan of garments. By designing products with longevity in mind, brands can significantly reduce the frequency with which consumers need to purchase new items, thereby lowering overall production demands.

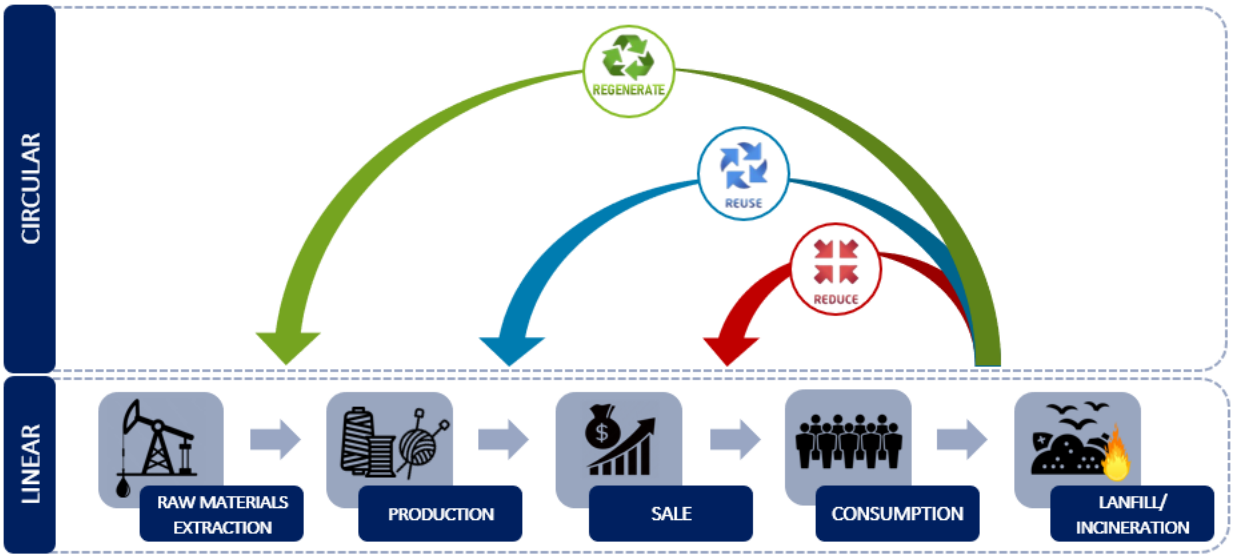
2. Reusing Garments

   The second strategy involves encouraging the reuse of clothing to prevent disposal at the end of its life. This can be done through initiatives such as second-hand markets, clothing rental services, or even repair and refurbishment programs that give old garments a new lease on life.

3. Regenerating End-of-Life Garments

   The third approach emphasizes the regeneration of clothing that has reached the end of its useful life. The goal is to recover fibres and reuse them as secondary raw materials for the production of new garments, thereby closing the loop in textile production.

Figure 9 - Preventing Textile Waste: Key Business Strategies for a Circular Economy



Source: Bressanelli et al., L'Economia Circolare per l'industria tessile

To embark on these paths, brands must employ various strategies. One crucial step is reconceptualizing the design of textiles and garments. This involves considering the entire lifecycle of materials from the planning phase, favouring the use of second-hand raw materials or biodegradable options. A notable example of leveraging this strategy is Orange Fiber, a company that transforms citrus production waste (like orange peels) into sustainable textiles using innovative patented technology.

Similarly, the use of ecological fibres, both natural (such as hemp, flax, and jute) and artificial (such as bamboo, lyocell, and modal), presents a promising alternative to virgin and fossil-based fibres. These eco-friendly options help mitigate the disastrous environmental impacts seen in production, washing, and disposal activities associated with traditional materials. However, the low-cost, high-volume production necessary to sustain and fuel consumer excess makes the transition to sustainable sourcing a long and uphill battle. While this shift is an essential evolutionary step, the current pace of change is slow, and scientific innovation is urgently needed to address the end-of-life of garments, unsold stock, and production waste.

The second essential strategy is rethinking business models by shifting the focus from selling garments to offering comprehensive services throughout the lifecycle of textiles. An example of this is Mud Jeans, a Dutch retailer that has revolutionized its business model by leasing jeans to its customers. This approach extends the lifespan of the jeans and drastically reduces waste generation, as Mud Jeans adopts take-back schemes to recover the garments at the end of their life, regenerates them, and leases them again to its customer base.

To conclude, the sheer volume of textiles ending up in landfills or incinerated, as previously observed, is alarmingly high. Recycling clothing requires mechanical separation and a chemical depolymerization process to return the predominant synthetic fibres to their original state—a process that is rarely observed today but could be feasible with existing technology. Unlocking this potential could revolutionize the industry's approach to sustainability. Equally crucial are comprehensive Life Cycle Assessment (LCA) studies to ensure that the energy consumption involved in these recycling processes does not outweigh the environmental benefits, potentially making the effort costly, inefficient, and ultimately unsustainable.

A notable example of successful innovation in this area is Aquafil, a producer of nylon yarn. The company has transformed its production process by investing in nylon depolymerization technologies, allowing it to convert end-of-life nylon products, such as old fishing nets, into secondary raw materials. This regenerated nylon, branded as Econyl, reduces CO2 emissions by 90%[39] compared to standard virgin nylon production and is consequently utilized by various fashion brands to create garments. Unfortunately, equally effective solutions have not yet emerged for polyester, which, as we've seen, remains the elephant in the room within the textile market, and its use continues to grow rapidly.

Overall, while waiting for the clothing loop to close, a highly relevant approach is to reconfigure the supply chain to implement reverse logistics mechanisms capable of recovering textiles that have reached the end of their life. H&M, in partnership with I:CO, has launched a garment

[39] Bressanelli G., Ioli M., Saccani N. (2021) *Avvicinarsi all'Economia Circolare nell'Industria Tessile: il Caso Punto Art*

collection service, sorting all used textiles and shoes into three categories according to the EU waste hierarchy: re-wear, by remarketing garments as second-hand clothing; reuse, by repurposing dead stock and old textiles to create new products; and recycle, by shredding them into other materials—all in exchange for a discount code. Notably, this initiative collected over 29,000 tons of textiles in 2019, equivalent to about 145 million T-shirts[40], demonstrating the potential impact of such programs in preventing waste from ending up in incinerators or open-air landfills.

5.3 The illusion of transparency: misleading claims and greenwashing

In recent years, the fashion industry's push toward sustainability has been met with both applause and scepticism. While many brands publicly declare their commitment to environmental stewardship and ethical practices, not all of these claims hold up under scrutiny. As the pressure to "go green" intensifies, so too does the temptation for companies to overstate—or outright fabricate—their sustainability efforts. This practice, commonly known as greenwashing, presents a significant challenge for consumers who want to make environmentally responsible choices.

But how can a consumer discern which brands are genuinely sustainable and which are simply riding the wave of eco-conscious marketing? The unfortunate truth is that, in many cases, they can't. The complexity of supply chains, the technicality of sustainability claims, and the opacity of certain business practices make it nearly impossible for the average shopper to separate fact from fiction. This is why the European legislator is stepping in, working to strengthen and expand regulations that hold companies accountable for their environmental and social claims.

Greenwashing often involves a variety of misleading advertising and branding strategies that are specifically designed to give the impression that a company or its products are far more eco-conscious or ethically virtuous than they truly are. These deceptive practices can create a false

[40] H&M Group (2019) *Garment collecting: from throwaway to here to stay*

sense of responsibility, making it difficult for consumers to accurately assess the real impact of their purchases. Common tactics employed by companies engaging in greenwashing include, but are not limited to:

- False Certification Claims: Brands may tout labels that appear to be certified by independent bodies but are actually created through the company's own sustainability programs, lacking any third-party verification or adherence to the highest environmental and social standards.
- Omission of Value Chain Information: Many brands fail to disclose crucial information about their supply chains, partly due to the lack of effective traceability mechanisms. This omission can obscure unethical practices or environmental harms occurring further down the value chain.
- Misleading Narratives on Circularity: Some companies claim to engage in circular production by using recycled polyester, for example. However, this polyester often comes from other industrial sectors rather than from post-consumer clothing, leading to a practice known as downcycling[41], which doesn't contribute to true circularity.
- Deceptive Use of Eco-friendly Terms: Words like "sustainable" or "responsible" are frequently applied to materials that, in reality, perform only marginally better than their conventional or virgin counterparts in terms of environmental impact.
- Reliance on Mixed Fibres: Fabrics like "Polycotton," which combine synthetic and natural fibres, are often marketed as more eco-friendly. However, these blends can be more difficult to recycle and may have environmental performances that do not significantly surpass those of traditional materials.
- Use of the Higg Index: The Higg Index, a widely-used tool developed by the Sustainable Apparel Coalition, is intended to assess the sustainability of materials. However, its reliability has been questioned, particularly after a critical analysis by *The New York Times*. The Higg Index is accused of favouring petroleum-based synthetics over natural fibres by focusing primarily on metrics like CO2 emissions and water consumption. While these are indeed critical factors, they offer a narrow perspective that tends to

[41] Downcycling refers to a process that results in a material of lower value compared to the original.

disadvantage natural fibres like cotton, which require more water and have higher carbon footprints. The Index largely overlooks other crucial factors, such as the social impacts of textile production, including labour conditions and the broader environmental impact of manufacturing processes. For instance, even though 93% of global polyester production occurs in Asia, using fossil fuels and occurring under less stringent environmental and social standards, the Index ranks polyester among the most sustainable fabrics globally, relying on data provided by Plastics Europe.

- Selective Reporting of Improvements: Some companies may highlight improvements in one area of production—such as reduced water consumption or the recycling of pre-consumer waste—while conveniently ignoring or downplaying negative impacts in other areas. This selective reporting gives a skewed impression of a brand's overall sustainability performance.

6. Understanding consumer awareness and readiness for change

After examining the existing shortcomings and the efforts made by policymakers to accelerate change, as well as the impacts caused by the business and its players, the final step to completing the puzzle is to evaluate the responsibility attributable to stakeholders, particularly consumers, and to determine which habits must be redirected.
What better way to achieve this than by directly involving them?

A questionnaire was developed and distributed as a central tool to explore attitudes, behaviours, and perceptions related to sustainable fashion. The primary objective was to gain an understanding of how individuals manage their wardrobes, what factors influence their purchasing decisions, and the extent of their awareness regarding sustainability issues within the fashion industry.

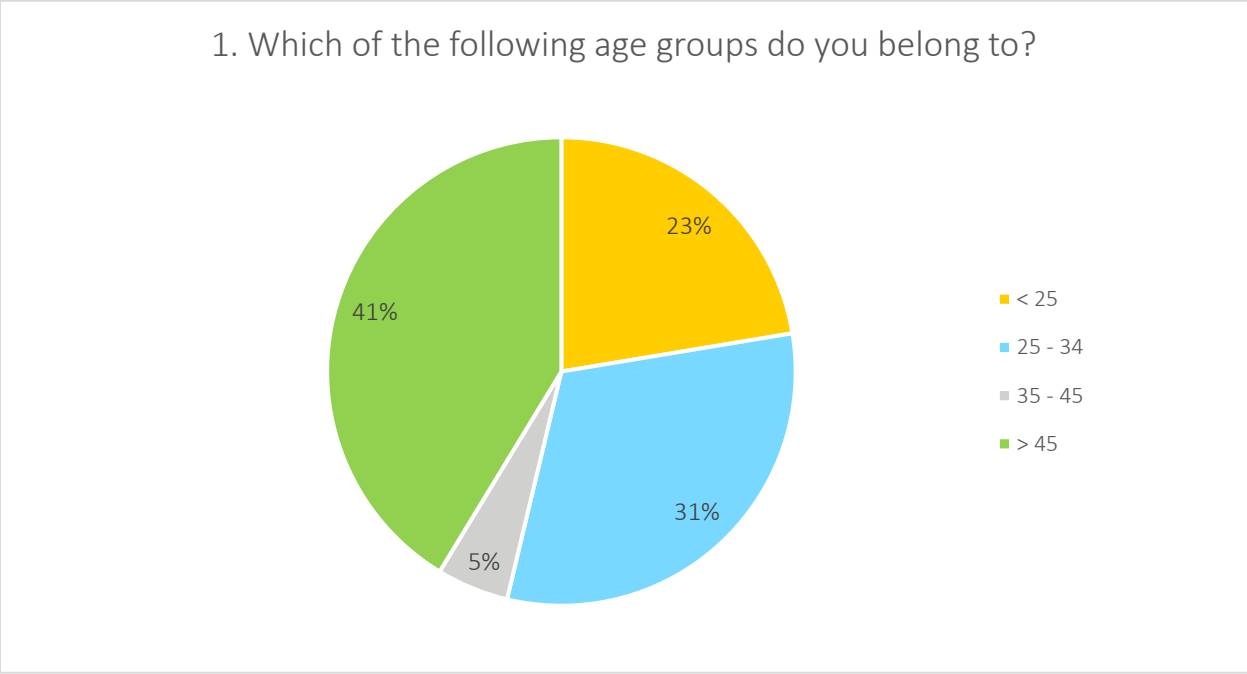
The second part of the survey investigates consumers' knowledge and sensitivity regarding brands, specifically examining their level of scepticism or trust towards sustainability claims

made on products. Understanding this is crucial in determining whether consumers are willing to support brands that claim to be sustainable or if they remain doubtful, relying on other factors in their decision-making processes.

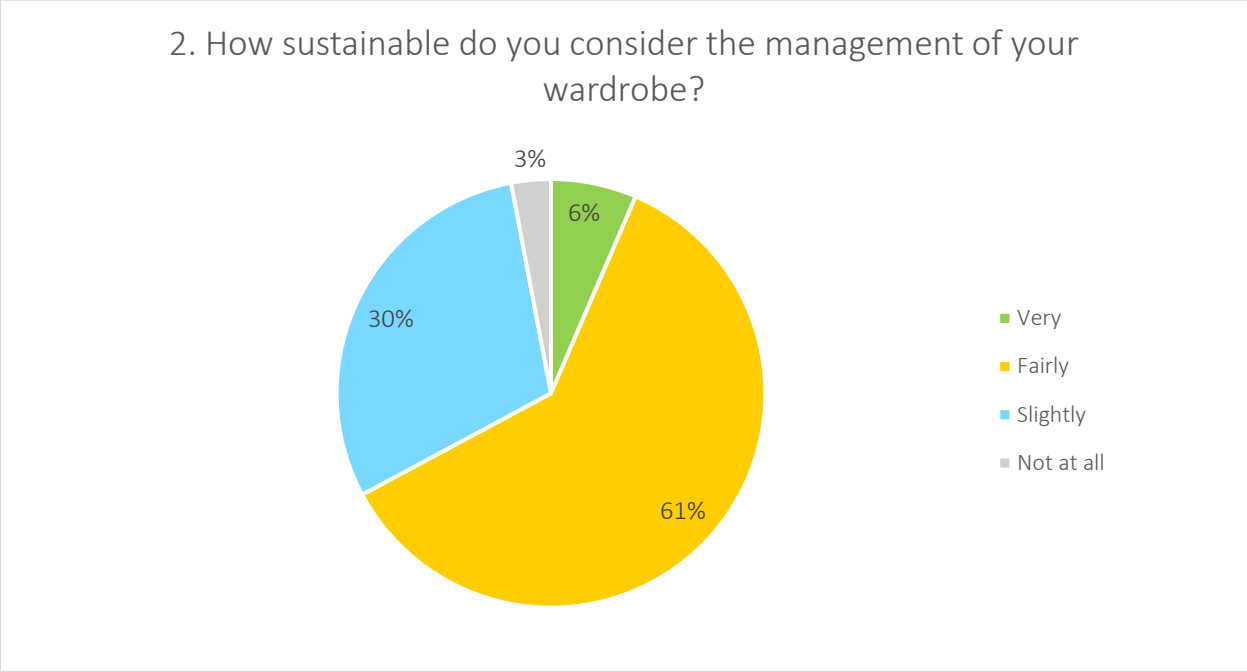
Finally, the last phase of the survey concentrates on the consumption of sustainable products and the barriers that hinder consumers from increasing their purchases. This section aims to identify areas where further education or targeted initiatives are necessary, as well as to inform strategies that the fashion industry can adopt to more effectively address the growing demand for sustainability.

6.1 Survey analysis

The questionnaire was completed by 201 participants, representing a diverse range of age groups. The largest proportion of respondents, 41%, were over the age of 45, indicating strong engagement from an older demographic. The 25-34 age group followed, accounting for 31% of participants, while 23% were under 25. Notably, only 5% of respondents fell within the 35-45 age range.



Among the whole voting population, 61% consider their wardrobe management to be fairly sustainable, with an additional 6% rating it as highly sustainable, placing themselves in the top tier of sustainability practices. This question was followed by a series of seven statements from which participants could select up to three to justify the level of sustainability they perceive in relation to their fashion habits.



An impressive 78% of respondents (156 votes in total) attribute the sustainability of their wardrobe management to their practice of donating or reselling unused clothing rather than disposing of it. This strong response likely reflects the growing popularity of online second-hand platforms, which provide a convenient way to earn money from old or unworn garments—an option viewed as far more advantageous than discarding them. For many, donating clothing is considered a thoughtful and easy alternative, allowing them to pass on items, such as outgrown adolescent apparel, to those in need. The underlying rationale for associating these practices with a "fairly sustainable" wardrobe is the extension of the product lifecycle. By choosing to

donate or resell, individuals aim to give their clothing a second life rather than letting it end up in landfills or incinerators, thus avoiding the environmental damage associated with disposal.

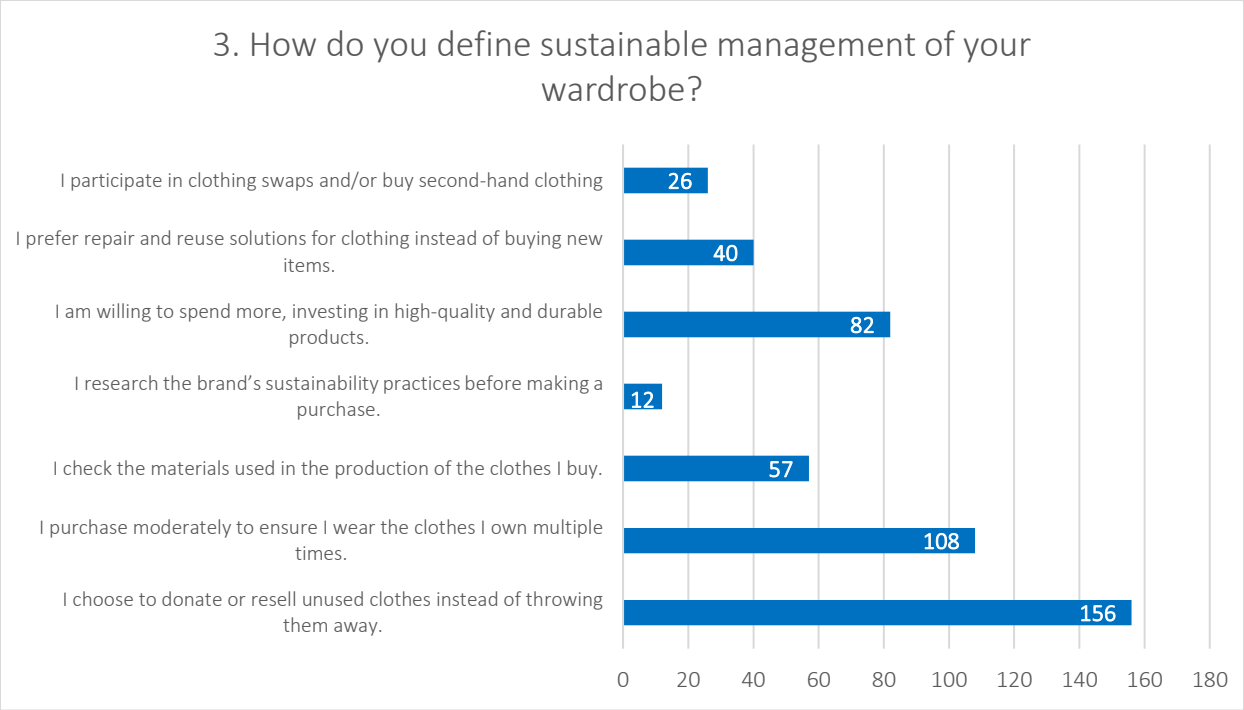
However, an important question arises: how can we ensure that the clothes we resell or donate actually have a sufficiently extended second life to make this choice environmentally sustainable? The reality is that once these items change hands, their fate is beyond the original owner's control. There is no way of knowing whether the new owners will treat second-hand clothing the same way they treat fast fashion—buying it at a lower price, only to wear it a limited number of times before replacing it. Indeed, the culture of disposability does not necessarily exclude second-hand clothing. Although sellers may be trying to extend the life of a product, often motivated by profit, there is little oversight regarding how the buyer will dispose of the item, and, truth be told, little interest in finding out.

Over half of the respondents also justify the relatively positive assessment of their wardrobe management by stating that they purchase moderately, ensuring that they wear their clothes multiple times. Again, sustainability is closely linked to the extension of the product lifecycle and its durability. The interpretation of why these two practices—donating/reselling and moderate purchasing—are the most frequently mentioned justifications may lie in the fact that they are unique actions entirely within the owner's control. Unlike considerations regarding product or brand characteristics, these decisions are perceived as straightforward and impactful, allowing individuals to effectively distance themselves from the overconsumption that drives fast fashion and its associated environmental and social impacts.

Interestingly, only 20% (40 respondents) indicated that they prefer repair and reuse solutions for clothing instead of buying new items, even though, like the previous options, it is a personal choice made on items in their possession, without external influences or the need for specific expertise. Perhaps the idea that paying for a garment that is unlikely to look as it did before, even when repaired, makes it seem not worth it, even though repairing is typically less expensive than buying a new product (except for fast fashion). Further, it ensures that the product's life

cycle is genuinely extended, as the item remains in the owner's possession and is reused rather than passed on to someone else, which may not guarantee its continued use.
The 41% of respondents state that they are willing to spend more on high-quality and durable products. Often, quality and a higher price are associated with greater sustainability, which, in terms of the garment's longevity, may be true. However, in many cases, the cost is linked to the brand, which may neglect quality while relying on its image and popularity to sell products at a premium, thus enhancing the markup on the product. It is no coincidence that luxury brands, such as the recent Dior scandal, continue to exploit low-cost labour in developing countries to produce bags that sell for thousands of euros, squeezing workers at the lowest possible cost. This raises the question of whether price and the perceived quality associated with a brand are true indicators of sustainability. While the exclusivity of these products might help avoid the mountains of pre- and post-consumer waste typical of fast-fashion giants, the social and environmental damage, especially in the supply chain, is often similar, even as luxury brands manage to conceal it behind their reputation.

The analysis concludes with the materials used in production, which are checked by 28% of respondents, likely more often as an indicator of sensation and comfort than environmental impact. This assumption is reinforced by the fact that only 6% of respondents indicated that they research the brand’s sustainability practices before making a purchase.



The fourth and fifth questions explore consumer preferences to understand what factors they prioritize when making a purchase, what they overlook, and under what conditions they are prompted to buy new products—whether they are habitual shoppers or influenced by specific circumstances or people. The fourth question asks respondents to rank eight factors in ascending order of importance from 1 to 5. The results indicate that design and aesthetics are the most important factors for consumers, which is quite predictable in the fashion industry, where e-commerce accounts for over 20% of retail sales[42]. Following closely are sensation (in terms of softness, lightness, and comfort) and functionality (how practical and versatile the product is), both of which received more than 120 total votes across the fourth and fifth importance levels.

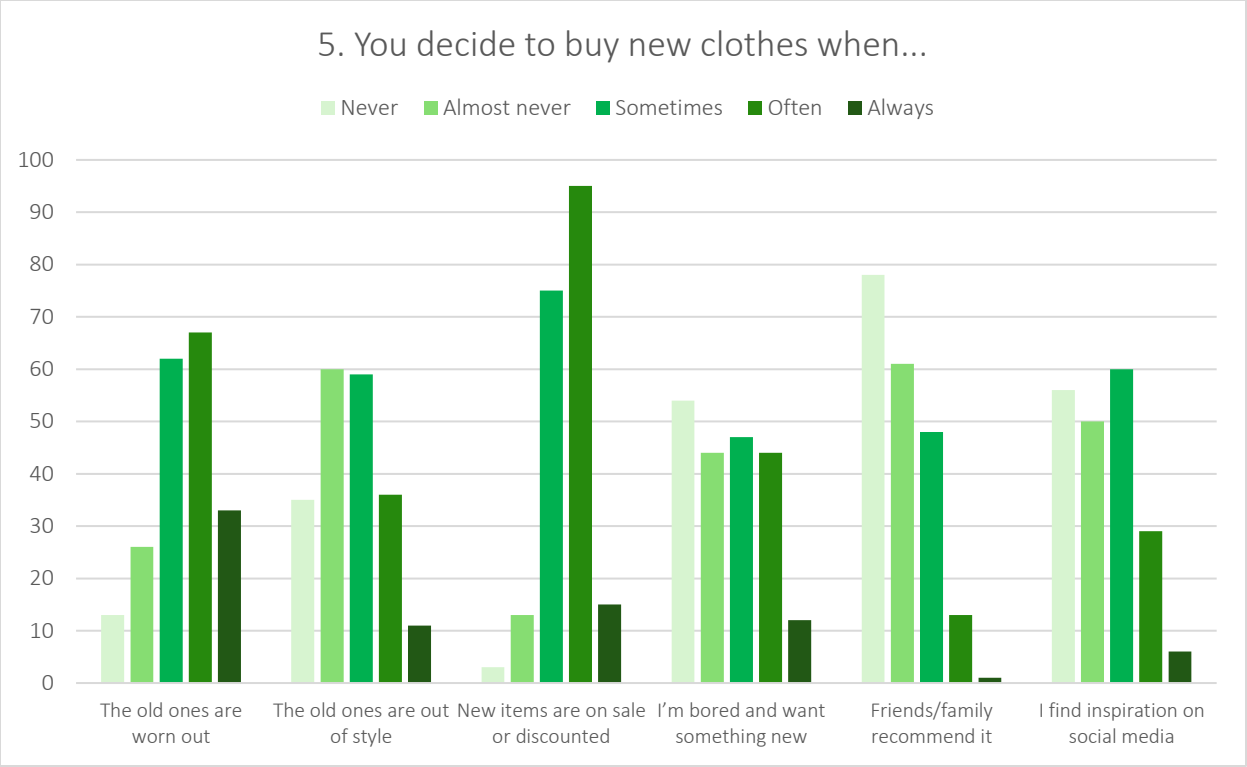
Surprisingly, price ranks fourth, with a total of 100 votes in the same levels, nearly equal to textile composition. This could be due to the fact that fashion buyers often know where to shop and what to expect, making it rare for them to evaluate an unfamiliar piece of clothing solely

[42] Coppola D. (2024) *E-commerce as share of total retail sales worldwide 2021-2027*

based on its price. Some consumers focus on quantity, gravitating toward fast fashion giants or medium-to-low-priced chains, where they consider the overall cost but do not prioritize the price of each individual item. Others may choose to invest more in brand or perceived quality, opting for higher-end boutiques and luxury fashion. On average, however, fashion consumers are aware of how much a garment costs and what they are willing to pay to expand their wardrobe, indicating that price is not one of the top aspects to be closely monitored. Surprisingly, brand received 110 votes in the first and second importance levels, making it one of the least significant aspects, closely followed by claimed sustainability values, which garnered 94 votes. The influence of the participants' age is likely a factor here, with over 40% being over 45 years old and thus less aware of current brand trends. Meanwhile, more than 50 votes were distributed between the fourth and fifth levels for claimed sustainability values, indicating that, on average, consumers are more likely to recognize and purchase an item because it is labelled as sustainable (through labels or online product descriptions, for example) rather than based on the brand's reputation or practices.

The fifth question seeks to investigate how frequently voters purchase clothing in relation to various justifications, in order to understand whether they are habitual in their purchases and whether they follow recommendations from people they know or from social media influencers. This information could be valuable in understanding how sustainable fashion products could follow the logical flow behind these purchasing trends to ride the wave and become more integrated among the options. The leading motivation for buying new clothes, according to 95 respondents, is often when items are on sale or discounted. In this case, the purchase is driven by the opportunity to buy an item that might have cost twice as much during the peak season, making it more appealing. Secondly, the fact that clothes are worn out is the second most common reason, which doesn't provide a specific window of opportunity but certainly indicates that these consumers are interested in using products until the end of their lifecycle, which could be extended through sustainable products, saving potential replacement purchases. Boredom as a factor is evenly distributed across the first four levels, from "never" to "often," so it doesn't offer significant insights, and neither does changing fashion trends, as it doesn’t

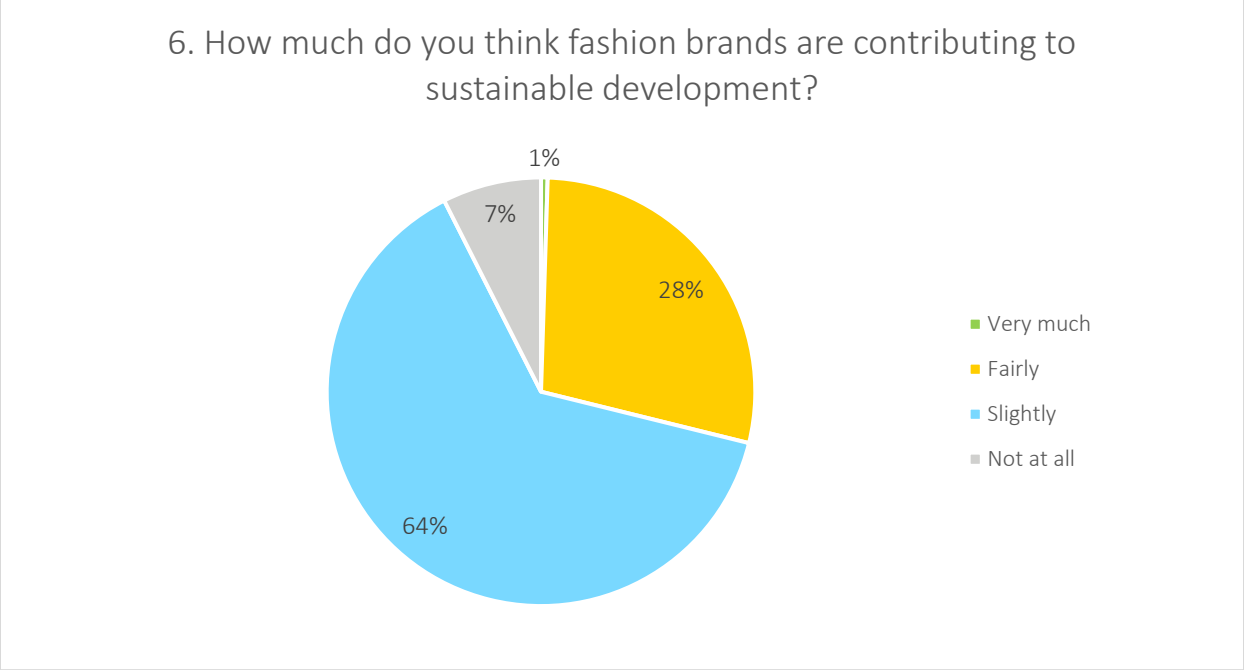
necessarily push consumers to immediately buy new items. There is a notable trend toward prioritizing social media recommendations over word-of-mouth from friends and family. However, just over 30 respondents indicated they "often" or "always" rely on social media for clothing purchases. This phenomenon may be partially attributed to the average age of the participants, as e-commerce on social platforms is significantly on the rise, alongside the influence of fashion influencers who sponsor products or showcase their outfits. This trend is likely to be more pronounced among younger demographics, who typically spend several hours a day engaging with social media.



The section just concluded aimed to identify consumer preferences, motivations, and purchasing habits in relation to their interpretation of sustainable fashion. The next section shifts focus to how the voting population perceives products and brands within this context. It examines whether consumers are really purchasing sustainable fashion items, identifies the main obstacles they face, and explores opportunities to raise awareness and encourage the adoption of such garments. Additionally, it investigates whether consumers perceive vulnerabilities related to price when opting for these products.

This part also seeks to understand how the survey participants view and trust brands, when assessing the credibility of their claims. It aims to determine whether they are informed about what it means for a fashion company to be responsible and which practices are considered ethical. Insights gained here could inform the reshaping of business and marketing strategies to better engage and educate consumers, enabling them to make informed choices.

The first two questions aim to assess whether, on average, voters believe that brands are doing enough to address the ESG impacts of the fashion sector and to evaluate their knowledge of individual brands, which helps gauge the awareness behind their responses. The results reveal that 64% of respondents feel that fashion companies contribute very little to the sector's sustainable development. In contrast, 28% consider the efforts sufficient, while minorities of 1% and 7% respectively view the brands' actions as contributing "very much" and "not at all."



The second question requires respondents to rank the sustainability level of 12 brands on a scale from 1 to 5, based on subjective considerations, brand perceptions, and knowledge of the products. Starting with the brands perceived by the population as the least sustainable, Shein ranks first, with 157 votes assigned to the "not at all sustainable" category.

This trend is unsurprising, as the Chinese textile operator epitomizes the fast fashion model, producing low-quality clothing at an average cost of €7, with a rapid turnover of new collections continually restocked and sold exclusively online through e-commerce. In 2020, according to Le Monde, it was the most visited website in the world.

Consistently, Zara ranks second as the founding mother of rapid and low-cost clothing production, capable of mimicking the latest high fashion trends with its ready-to-wear collections that fuel consumerism in the fashion world. However, Zara is far behind Shein and not far from the brands that follow, which can be justified. The Inditex Group has established a group-level sustainability plan aimed at replacing all fabrics currently used to create garments by 2025. The company is committed to ensuring that, by 2025, all cotton, linen, and polyester used will be organic, sustainable, or recycled. Furthermore, the group is investing in the development of new recycling technologies, collaborating with MIT to recover fibres from old garments using exclusively clean energy.

In addition to focusing on materials and recycling used garments, Inditex claims to be working to reduce global pollution caused by their production: it plans to eliminate single-use plastic by 2023 and use 80% renewable energy for stores, warehouses, and offices. Zara has participated in Greenpeace's Detox My Fashion campaign, and according to the organization's sustainability reports, it has kept its promises by reducing the use of harmful chemicals during production.

Despite these commendable efforts, Zara's primary goal remains to continue growing and producing an increasing number of garments, at a pace of 10% annually. This may be good news for shareholders, but it poses a challenge for the planet: no matter how green the supply chain is if they continue to produce more clothes than are really needed. According to a recent interview conducted by Fast Company, Zara executives assert that "making clothes quickly doesn't mean encouraging consumers to treat them as disposable. After all, many people have Zara garments bought years ago in their wardrobes." While this statement holds some truth, much depends on consumer behaviour.

Zara is efficient, fast, and functional, but its entire supply chain is designed to churn out the latest looks quickly and at low cost, often sacrificing product quality and durability. After all, we know how quickly fashion goes "out of fashion." In short, despite its efforts, fast fashion cannot be equated with sustainable fashion.

Following closely in the rankings are Nike and Adidas, which received the same number of votes in the lowest categories, distributed similarly, and Veja immediately after. Although providing a definitive classification is challenging due to the varying factors assessed by sustainability indices, it raises questions about the fairness of positioning these two sportswear companies in this regard. Both the BoF Sustainability Index 2022 and Fashion Revolution's "What Fuels Fashion" report published in 2024 rank Nike, Adidas, and even Zara between 37 and 41 points out of 100. It makes sense for them to be grouped together, but it remains uncertain whether they truly deserve to be at the bottom of the rankings compared to other brands. Indeed, Nike and Adidas are fast fashion giants in the sportswear niche.

Veja, instead, finds itself in a position it doesn't deserve. Often misunderstood due to its popularity and relatively low price range compared to other sneakers—more or less aligned with Nike and Adidas—the French brand offers a wide range of high-quality products, including eco-friendly shoes, sneakers, and accessories made from sustainable and recycled materials. Veja is known for its ethical production approach, emphasizing transparency, fair trade, and environmental responsibility. The iconic shoes featuring the 'V' logo, which we see almost daily, are made from organic Brazilian cotton grown without pesticides or chemicals, rubber sourced from Amazonian rubber trees harvested directly by growers, and a fabric made entirely from recycled plastic bottles.

The next brand highlighted by consumer votes is Uniqlo, which is part of the Fast Retailing Group and is currently working to distance itself from the fast fashion label. Often perceived as a company that promotes rapid turnover and consumerism—likely due to its price positioning or its supply chain established in Japan—Uniqlo actually focuses on quality, value, and the longevity of its garments, which border on timelessness. Observing the brand across different seasons and time frames reveals that Uniqlo does not chase fleeting fashion trends; instead, it emphasizes innovation, quality, and attention to detail, with its mantra being "life wear."

The BoF Sustainability Index, along with the ranking provided by Fashion Revolution, places Fast Retailing Group further down the list, with a score of 30, ranking 17th among the brands considered. However, the Index also highlights the most rapid and significant improvement within the entire benchmark. This upward trend confirms the company's repositioning efforts, which, although already distanced from fast fashion production and consumption models in terms of value proposition, are now actively defining its identity in the realm of sustainable development—and it appears to be succeeding.

Ranked just after are Gucci and Levi Strauss, both positioned in the upper half of the benchmark, with only a few votes separating them. Gucci, in particular, was ranked as the second most sustainable brand out of 250 analysed by Fashion Revolution in 2024 and was placed sixth in the 2022 Fashion Transparency Index. This strong performance can be attributed to several key factors. Notably, Gucci has recently become the first major luxury brand to form a strategic partnership with the Ellen MacArthur Foundation, pioneering efforts in promoting circular fashion. This partnership focuses on two primary areas: circular design and regenerative agriculture, aimed at minimizing environmental impact while regenerating soil fertility.

Gucci's commitment to sustainability was evident as early as 2020 with the launch of the "Off The Grid" capsule collection, featuring garments and accessories made entirely from recycled, organic, and sustainable materials. These include Econyl, a nylon derived from fishing nets and other waste materials, and Demetra, a new animal-free leather made primarily from sustainably sourced wood pulp and bio-based polyurethane. As part of its climate-friendly strategy, Gucci is also funding wool regeneration programs in Patagonia and cotton regeneration in Uruguay, ensuring these fibres are obtained through environmentally responsible processes rather than exploiting natural resources.

All these efforts, along with social and governance initiatives, align with the broader sustainability strategy outlined by the Kering Group in its 2025 action plan. Typically, one might expect consumers to view luxury fashion houses more favourably regarding sustainability, as

concerns about low quality and consumerism-induced waste are less applicable given that these products cater to a niche clientele. However, the relatively lower consumer perception of Gucci's sustainability stems from a growing distrust toward luxury fashion brands. Consumers are increasingly cynical and sceptical, often viewing these companies as cold and relentless in their pursuit of profit, exploiting workers and communities within their supply chains.

This perception is reinforced by high-profile cases, such as investigations into brands like Dior and Armani by antitrust authorities, accused of subcontracting to companies that employ underpaid labour in poor working conditions. Such media coverage fuels distrust and perpetuates the notion that luxury fashion lacks social ethics. This underscores the need for stringent due diligence directives and regulations to verify the accuracy of sustainability claims. Ensuring transparency and preventing human rights violations requires allowing regulators to conduct rigorous audits and holding companies accountable for the actions of their suppliers and contractors. This is a critical step toward rebuilding consumer trust, making them more confident that they are not being deceived, and guiding them toward more sustainable purchasing decisions.

Levi Strauss's positioning aligns well with its reputation as a brand dedicated to second-hand sales, but the company is doing much more, securing the top spot in the 2023 Circular Fashion Index for mass-market brands. This improvement is largely due to increased investment in communication and consumer education activities. Notably, the brand has created a dedicated shopping page specifically for recycled denim products and, starting in 2023, began publishing its supplier map to transparently showcase its carbon footprint.

The brands perceived as most sustainable by the voting public, in descending order, are Patagonia, Timberland, Stella McCartney, and Moncler. Notably, Patagonia stands out as the only brand receiving a predominantly positive rating, with 91 votes in the top two tiers, while the others are viewed as somewhat distant from true sustainable development. Patagonia has built its reputation in sportswear on its strong connection to nature, symbolized by its logo depicting

the silhouette of Mount Fitz Roy, located at the border between Chile and Argentina in Patagonia.

Patagonia's commitment to environmental causes and conservation reinforces its image as one of the most sustainable brands. Both sustainability indices and the company's initiatives support this perception. In the book “Fashion Industry 2030. Reshaping the Future Through Sustainability and Responsible Innovation” (Francesca Romana Rinaldi, 2019), Patagonia is frequently cited as a case study across various parameters.

The company's mission is to create the best products based on three pillars: functionality, repairability, and, most importantly, durability. All products are made from materials that can be reused and recycled, and they are easily repairable through the WORN WEAR service. Patagonia designs and manufactures garments and accessories with minimal impact on the supply chain regarding resource extraction, manufacturing, transportation, and, consequently, water usage, energy consumption, greenhouse gas emissions, chemicals, and waste. This systemic approach extends to their suppliers, who are equally committed to sustainable production.

Patagonia's circular approach began with the use of recycled fibres, producing recycled polyester since 1993, thus reducing dependency on non-renewable resources like petroleum. By the Fall 2020 season, 84% of the polyester fabrics used by Patagonia were made from recycled polyester. To extend the life of its garments, Patagonia refurbishes and resells them, effectively managing a second-hand market through the WORN WEAR service. This service allows customers to return unused Patagonia items so the company can clean, treat, and resell them on a dedicated website. Additionally, the WORN WEAR Tour, provided through a custom-built van with a distinctive design, offers free repairs for all types of clothing, both Patagonia and beyond.

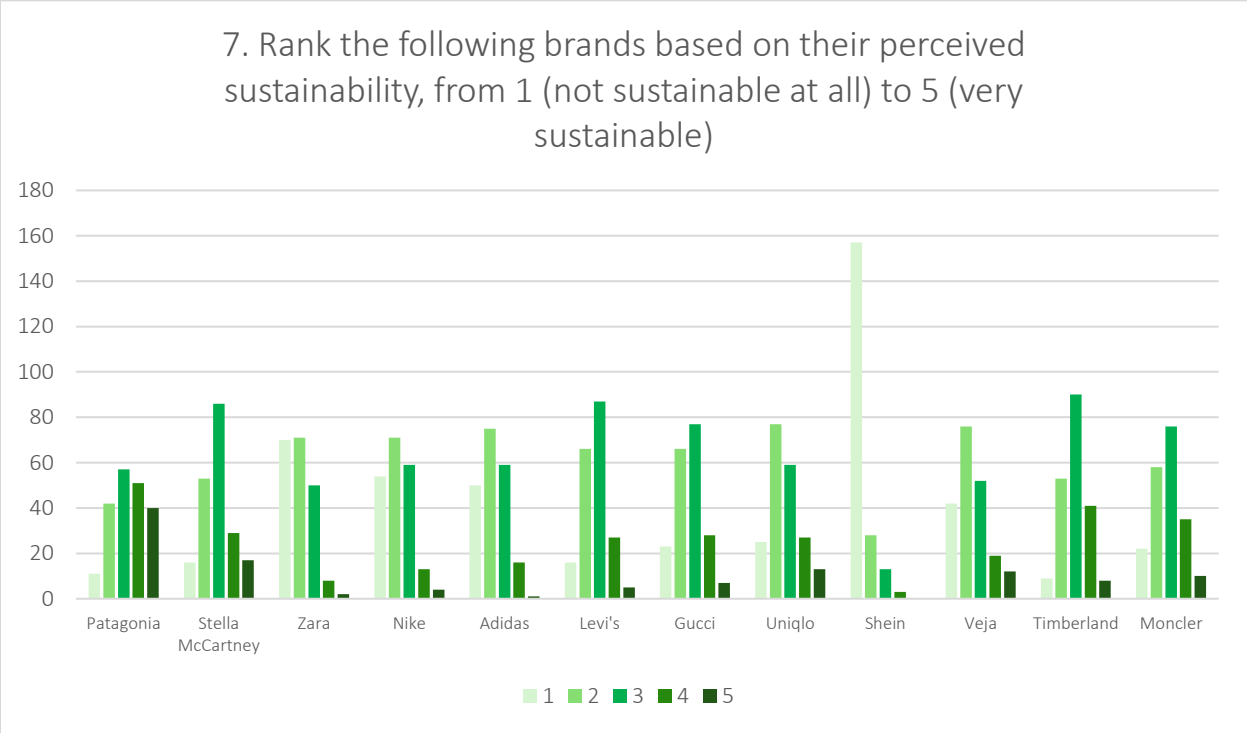
In the case of Moncler, its position is likely influenced by its association with a higher sustainability ranking compared to Gucci, attributed to its lesser exclusivity and its shift towards streetwear, partly due to its recent acquisition of Stone Island. Founded less than 45 years ago in

Modena as a producer of military uniforms, Stone Island has rapidly evolved, becoming synonymous with continuous research and innovative materials and production techniques. The brand enjoys strong customer trust and loyalty, although its garment prices have soared. Consumers perceive it as sustainable due to the use of technical fabrics and production processes maintained in Italy. While raw material suppliers come from Japan, Korea, and China, Stone Island's highly skilled suppliers handle production processes in Italy. Although this information may not be accessible to every voter, the brand's local presence fosters the perception of "kilometre zero" production.

Timberland and Stella McCartney, ranked second and third respectively, have not received votes that accurately reflect their commitment to sustainable development. Timberland's sustainability is deeply ingrained in its business strategy, with nearly all models incorporating recycled, organic, or renewable components. Seventy-five percent of the cotton used in their clothing is organic, recycled, or fair trade. Timberland's Second Chance program allows customers to return unused shoes in exchange for a 10% discount on their next purchase.

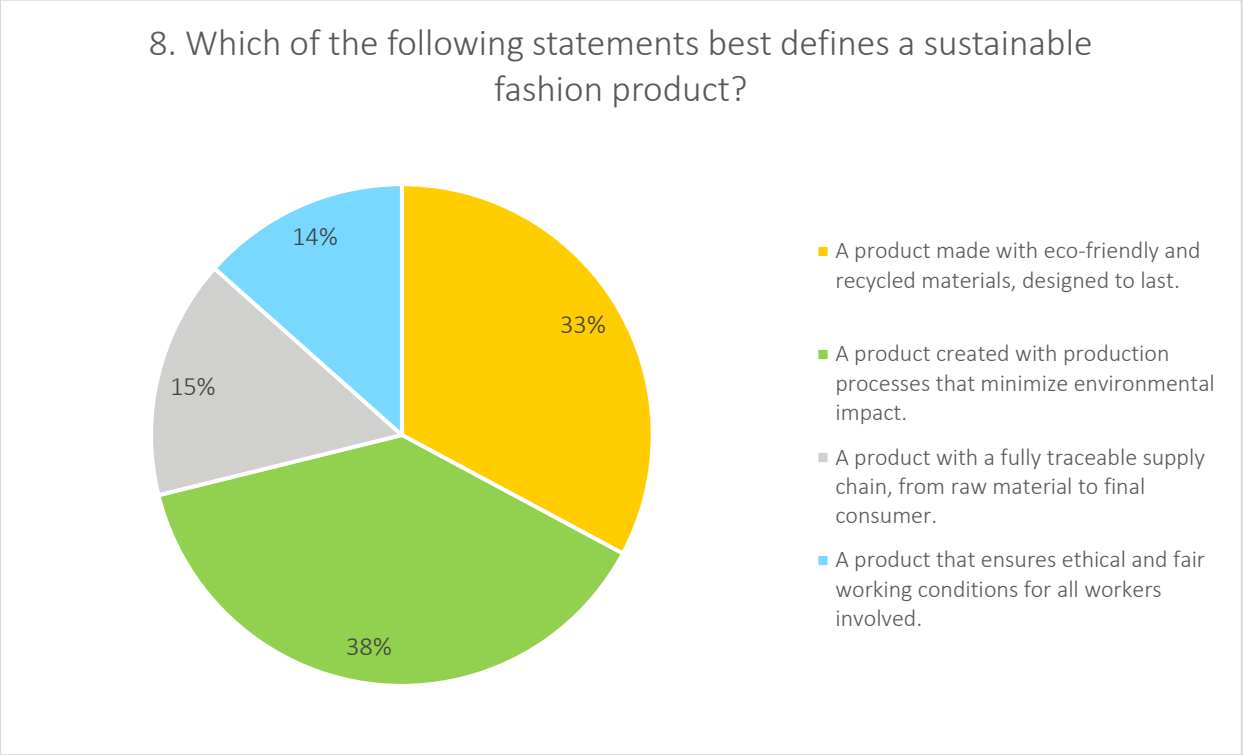
Stella McCartney has been using innovative materials and promoting an alternative and ethical marketing ideology since 2001, when sustainability was not yet a mainstream topic. Her collections incorporate materials like faux suede, recycled polyester, and eco-friendly natural or synthetic fibres, including organic cotton and regenerated cashmere, which offers the same quality as original cashmere but reduces environmental impact by approximately 92%, as measured by the 'Environmental Profit & Loss' (EP&L) tool. Her iconic Falabella Bag, launched in 2010, was made entirely from eco-sustainable materials: the exterior was crafted from plant oils, and the linings were made from recycled plastic bottles. Thus, Stella McCartney is recognized as a pioneer in sustainable luxury fashion, establishing one of the first major global high-fashion brands rooted in sustainability (Amed, 2015). However, the target audience—primarily women aged 25 to 45 who are environmentally conscious—still presents opportunities for improvement, as survey data suggests that the perception of the brand's sustainability does not align with its actual offerings. While the brand and its bags are widely recognized among consumers, there is

concern that many are more attracted to the product's design than its sustainability features. After all, question four highlighted that aesthetics remain the primary factor influencing voters' purchasing decisions.



The purpose of the eighth question is to understand which factor consumers associate most with the sustainability of a product. Specifically, whether they associate it with the choice of eco-friendly and recycled materials that can extend the life cycle of the garment, the reduction of environmental impact in production processes, the traceability of the supply chain—including whether raw materials are renewable or not, how they are extracted or cultivated, where they come from, and the dynamics surrounding the procurement of components necessary for the final product—or whether they focus on workers' conditions, a factor more closely related to the social sphere. There were clearly no right or wrong answers, as all these topics are covered in the various chapters on ESG impacts in the industry. The aim is to pinpoint which factor most immediately defines a fashion product as sustainable in the consumers' minds.

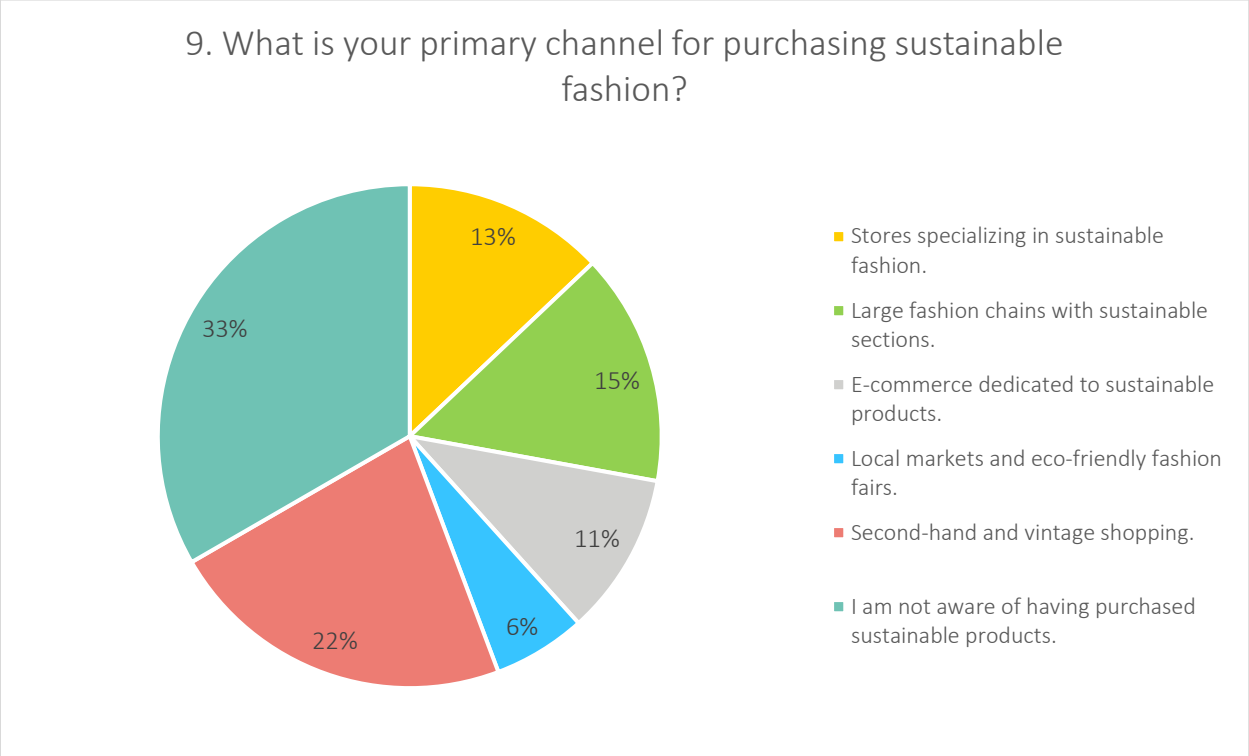
The 38% of respondents associate the sustainability of a product with its environmental impact. Another 33% link it to the choice of eco-friendly materials for design and durability, while the remaining 29% is split between supply chain transparency and working conditions. The social factor, at 14%, doesn't necessarily mean it is overlooked compared to environmental concerns, since the respondents could only choose one answer. Instead, it reflects a greater focus on environmental characteristics. These are indeed aspects they can assess when choosing a garment, contributing to the texture, feel, practicality, and durability of a purchase—things they are accustomed to considering without apparently needing in-depth knowledge. Additionally, they are able to weigh environmental consequences and compare the impact of one product or brand against another based on composition and materials, whereas the social aspect feels more distant to them. They tend to distrust what is said about social conditions and lack the information needed to form an informed judgment.



The final phase of the survey focuses on the consumption of sustainable products and the obstacles that prevent consumers from increasing their sustainable purchases.
The first pie chart reveals that the 22% of respondents purchase sustainable clothing through second-hand and vintage shopping. While this is indeed a sustainable choice, as it gives garments a second life and prevents them from potentially ending up in landfills or being incinerated, it doesn't necessarily mean that the products themselves are sustainable. Many of these items still originate from fast fashion companies and are purchased through these channels because they belong to previous collections or can be bought at a lower price.

Most respondents stated that they are unsure if they have ever purchased such products, whether made from recycled or eco-friendly materials, regenerated fibres, or ecological fabrics. This means that less than half of the respondents consciously purchase sustainable clothing from the options provided in the survey. Among those who do, the most common approach is purchasing from large chains with sustainable sections—typically eco-friendly lines and collections launched by well-known mass-market brands that they are already familiar with and perhaps accustomed to buying from.

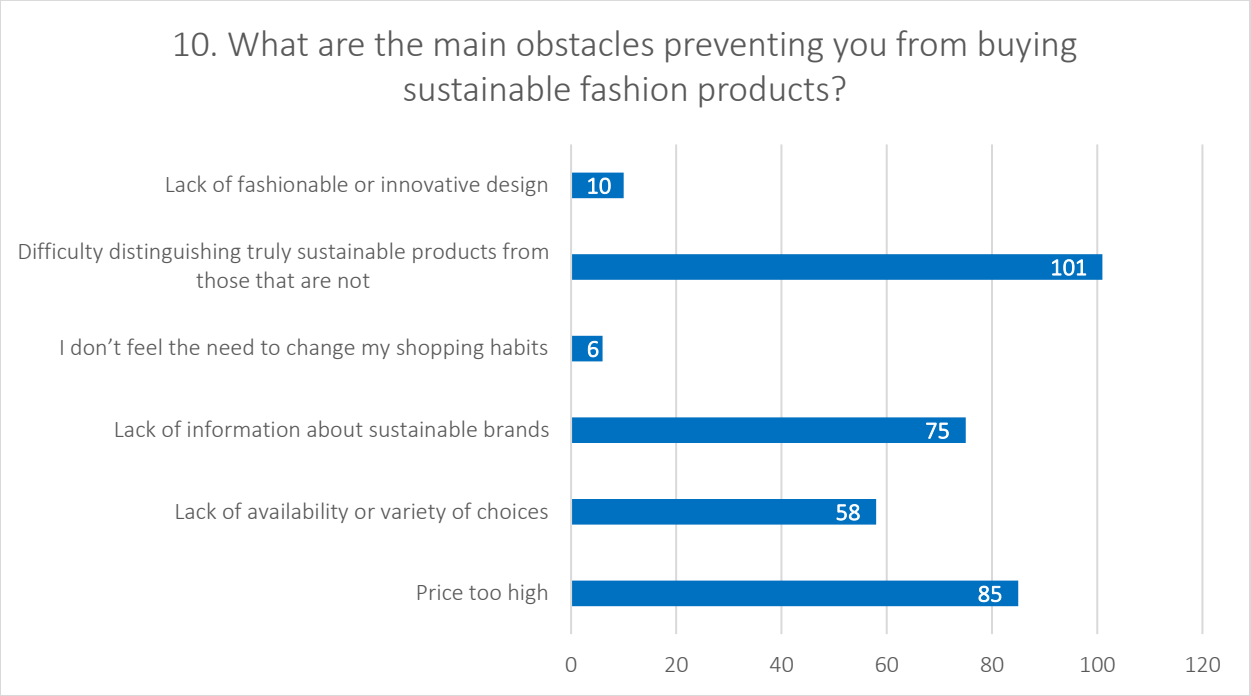
A minority of 6% engages with local markets and fairs, while 13% visit specialized stores. What stands out the most is the 15% related to e-commerce. This might be once again the influence of the dominant age >45 age group, for whom online clothes shopping is one of the less attractive options. However, today, browsing online is the best option not only for purchasing but also for raising awareness, gaining education, and expanding knowledge about this niche of products. Many emerging brands dedicated to sustainability do not have physical retail stores, but they are present on social networks, where consumers can access their websites for purchases and gain visibility through popular bloggers and influencers. Additionally, well-known brands, including several luxury houses, offer comprehensive online services that promote sustainability awareness and marketing for their products, educating consumers on how these products are made and how they are more sustainable from both environmental and social perspectives.



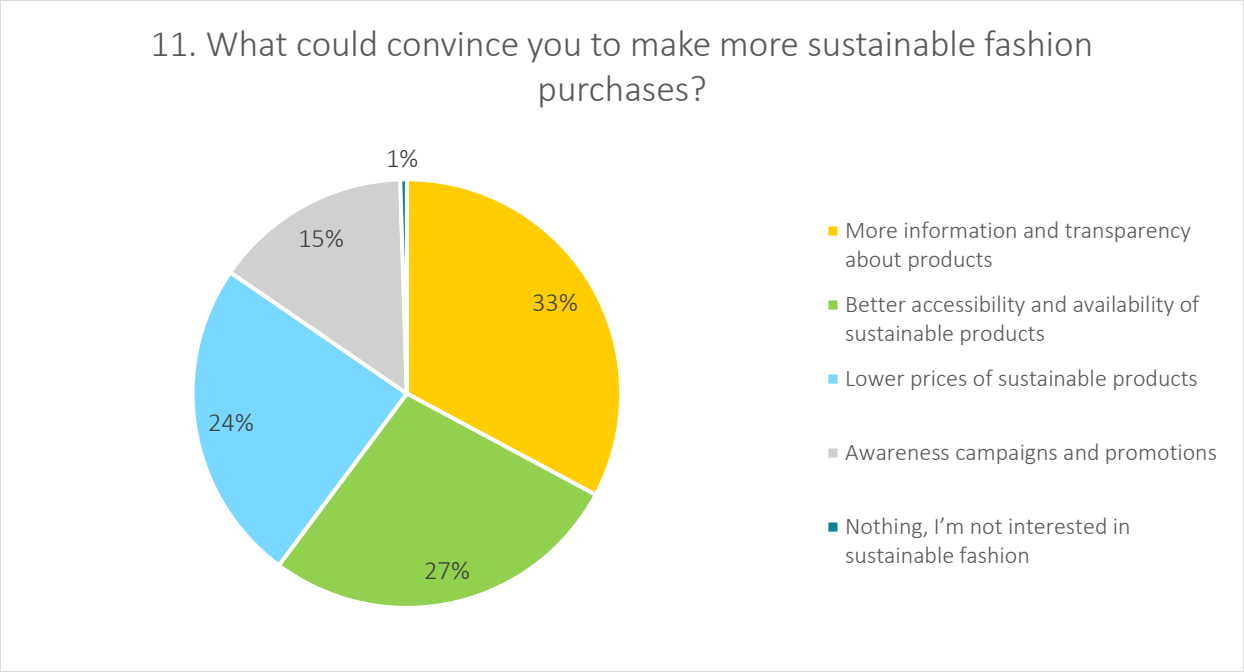
Regarding the obstacles that hinder large-scale purchasing, the three main ones identified, in order of importance, are the difficulty in distinguishing truly sustainable products from those with false claims, the high price, and the lack of information about brands. Indeed, these are some of the most debated issues in the world of sustainable fashion. The first is being addressed by the new directive on green claims, the digital product passport, and the new labelling requirements in the amendment to the EU Textile Labelling Regulation. It will be essential to educate consumers on the benefits of these regulations, making them feel protected and empowered to make informed choices without fearing misleading marketing strategies.

Regarding the lack of information, there is a pressing need to significantly amplify promotional campaigns and advertising for sustainable products. The present moment offers an excellent opportunity to start this effort. Now that it is clear there is interest among the majority of consumers, and with increased regulation allowing them to trust what is being offered, it is time to engage mass media with compelling and scientifically grounded proposals to capture this

entire segment of the market. According to the survey, 67 out of 201 consumers are unsure whether they have ever purchased products related to sustainable fashion. A portion that when extrapolated to a larger community, represents a significant segment of the market.
The price issue will be tackled in the respective question.



To support the aforementioned aspects, the following question asked participants to vote on which of five options would most encourage them to increase their purchases of sustainable fashion and reduce obstacles. Consistently, 33% of respondents indicated that more information and transparency would help, while 27% cited greater accessibility and availability, reflecting both a lack of reliability and awareness about the sustainable products currently available. Meanwhile, 24% expressed that a reduction in price would be the key motivator.



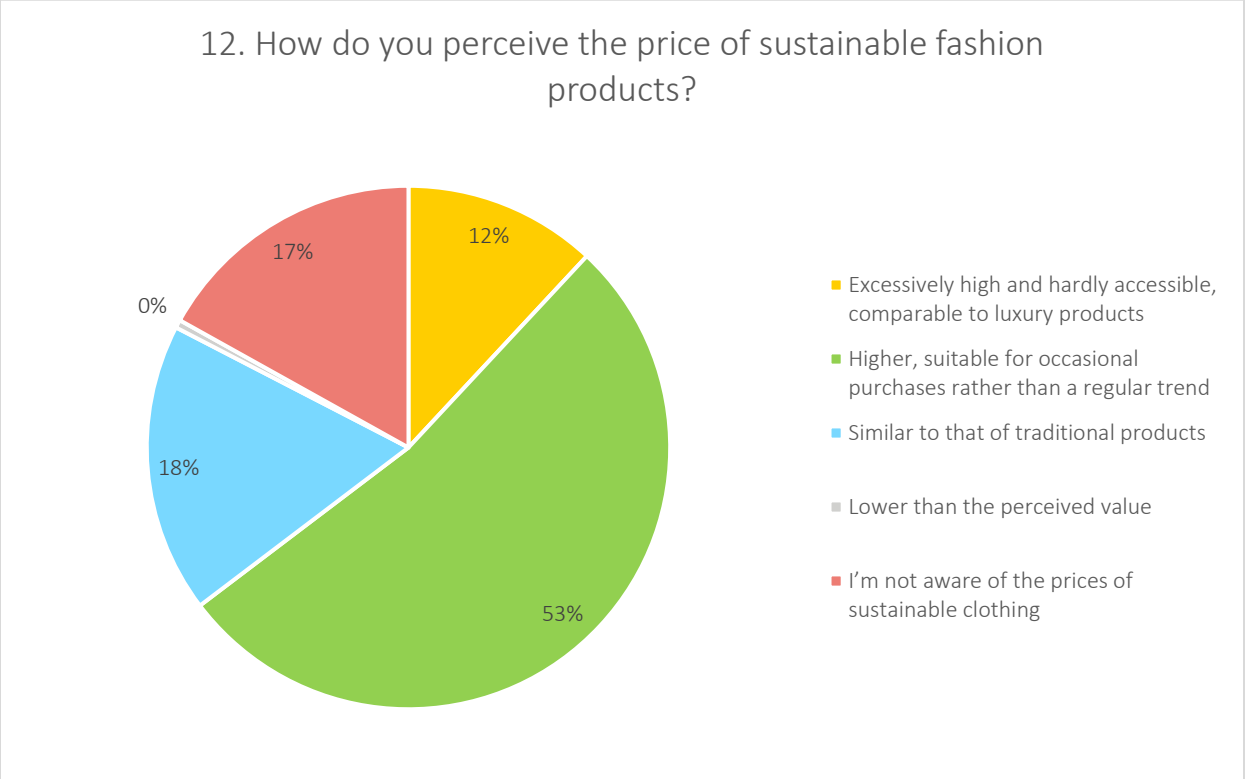
Regarding this last point, the final question explores how the perception of high prices affects consumers' willingness to purchase sustainable products. More than half of the respondents perceive sustainable fashion as expensive compared to traditional alternatives, viewing it as suitable for occasional purchases rather than a regular habit.

Brands need to educate consumers that comparing an eco-friendly product to one made from virgin fibres, especially within the fast fashion model, is not a fair comparison. The price disparity is inevitable; sustainable fashion cannot be low-cost, but it is crucial to emphasize the added value it provides.

Recycled or regenerated materials come with inherent costs, including collection, sorting, and reprocessing stages. The production cycle, starting from these materials and ending with the final product, requires innovative technologies, often realized through strategic partnerships or substantial investments. Furthermore, production processes must be carefully managed—avoiding overproduction, yet not restricting stock to the point where prices rise, turning sustainable fashion into an exclusive luxury. Fair wages, workers' rights, and safe working conditions must be ensured throughout the supply chain, ideally in countries with strict labour and production regulations to prevent exploitation. Even the packaging should be

environmentally compatible, made from recycled materials, aiming to eliminate plastic in favour of zero-waste solutions.

All these factors contribute to the higher final cost of sustainable fashion compared to fast fashion or similar products made from virgin materials. However, from a broader perspective, these aren't costs but rather prices that reflect the preservation of nature and ecosystems in which we live and for reducing social inequalities.



7. Reversing the unsustainable path of fashion

Throughout this thesis, we have examined the wide-ranging ESG (Environmental, Social, and Governance) impacts of the fashion industry, a sector whose reach extends far beyond aesthetics and personal expression. From environmental degradation and the depletion of natural resources to social injustice and systemic exploitation of labour, fashion's consequences ripple across ecosystems, economies, and human lives. Reversing this harmful trajectory requires a coordinated effort, involving both industry leaders and consumers. The future of sustainable fashion rests on the adoption of ethical, eco-conscious practices, a paradigm shift in production models, and a reimagining of consumer behaviour.

7.1 The role of brands

From a brand perspective, it is evident that the current fashion industry model is deeply flawed. We have seen the environmental toll from every stage of production: the extraction of raw materials, cultivation, manufacturing, dyeing, finishing, washing, and disposal of garments. Vast quantities of water are consumed and polluted in the process, while billions of garments are produced annually, with only a negligible fraction recycled in a true closed-loop system. Most textiles end up either in landfills or incinerated, contributing to ecosystem destruction, pollution, and an ever-growing waste crisis. Brands bear a significant responsibility for these outcomes, as they have built their business models on fast cycles of production and consumption, incentivizing both overproduction and overconsumption. This has led to the rapid depletion of resources, the destruction of habitats, and a threat to biodiversity.

Beyond environmental impacts, the fashion industry's social burden is equally alarming. Millions of workers in the global supply chain, particularly in developing countries, are subjected to exploitative conditions, insufficient wages, unsafe work environments, and human rights violations. The majority of these workers, often women, are paid far below living wages, trapped in a cycle of poverty and disempowerment.

It is clear that addressing these issues individually will not be enough. We must confront the root of the problem: the unhealthy business model that drives brands to prioritize revenues and growth at the expense of the planet and its people. Currently, the fashion industry is structured to produce as much as possible, at the lowest possible cost, to maximize profit margins—especially for publicly traded companies pressured by shareholders. The relentless pursuit of profit has led to a scenario where fashion brands are producing far more garments than consumers need, flooding the market with cheap, low-quality items designed for short-term use.

Marketing, social media, and e-commerce have fuelled this vicious cycle by perpetuating the notion that staying fashionable requires constant wardrobe updates. Brands have transitioned from launching two seasonal collections a year to releasing up to 52 "micro-collections" annually, keeping customers hooked on the next trend[43]. However, no consumer wakes up with the desire to replace their wardrobe every week; this demand has been artificially created. Overproduction and overconsumption go hand in hand, both driven by the unsustainable pace of fast fashion.

The affordability of these garments, made possible by economies of scale and externalizing the true costs of production, means that consumers feel no financial burden when making a purchase, nor any guilt when disposing of it after only a few wears. Prices are kept low by outsourcing production to countries where labour and raw materials are cheap, often due to weak worker protection laws and environmental regulations. The result? Cheap, disposable clothing that is worn briefly and discarded, with no thought given to its end-of-life impact. More than 100 billion garments are produced every year, yet less than 1% are recycled back into new textiles.

Despite the undeniable contribution of brands in this crisis, there are still avenues for change. We have seen the rise of regulatory frameworks like the Corporate Sustainability Reporting Directive (CSRD) and the Corporate Sustainability Due Diligence Directive (CSDDD), which hold companies accountable for their entire value chain, from raw material sourcing to end-of-life

[43] Ward M. (2024) *Fuori Moda!*

disposal. Brands must shift their focus from financial gains to the long-term well-being of the environment and society. The fashion industry needs to transition from a fashion-centric model to an eco-centric model, prioritizing sustainability in every aspect of production.

One of the most urgent needs is investment in waste management technologies. Brands should partner with innovators in mechanical and chemical recycling to break down textiles into reusable components. This will allow for the creation of new garments from old ones, helping to eliminate landfills and incineration as waste disposal options. Further, brands are required to play a crucial role in reshaping consumer preferences—that same preferences they have shaped and exploited to reach economic success. By using the power of marketing not to sell more, but to foster a collaborative relationship with consumers, brands can encourage the return, repair, or repurposing of old garments. Initiatives such as clothing rentals, swapping platforms, and repair services offer tangible ways to extend the life of garments while simultaneously building brand loyalty.

7.2 The role of policymakers

One of the most pressing issues in the fashion industry is the widespread use of misleading communication about sustainable materials and production processes. This raises significant responsibilities for legislators. As seen through the survey and industry research, consumers are increasingly interested in making choices that reflect eco-friendly production techniques and stricter ethical standards. Yet, the primary dilemma faced by many shoppers keen for change remains unanswered: "How can I tell if a garment is truly sustainable?" Unfortunately, providing a simple answer to this question is impossible.

New regulations concerning labelling, green claims, and digital passports are an important step in curbing deceptive marketing practices. These measures are intended to restore some level of trust in the information consumers encounter on products and through promotional campaigns. However, there is a deeper, systemic issue that transcends regulatory frameworks or the intentions of individual brands: the sheer complexity of understanding what is written.

Consumers have every right to feel insecure and to point fingers at companies, especially if we look at a recent study conducted by the Joint Research Centre of the European Commission, highlighting that around 39% of sustainability claims in the textile sector are either false or ambiguous.
For years, brands have exploited regulatory gaps, subtly embedding the idea of sustainability in the minds of consumers, just enough to create non-existent associations between products and environmental responsibility, without crossing legal boundaries or providing scientific evidence. Often, they disclose half-truths, showcasing the "green" aspects while burying other significant environmental or social weaknesses, enabling partial and ambiguous interpretations. Indeed, it is often the brands that shout the loudest about sustainability that have the most to hide.

The current regulatory landscape is inadequate in addressing these strategic ambiguities and omissions, and certifications do not provide substantial assistance.
Certifications are meant to guide consumers by providing a universal language for understanding whether companies and their suppliers adhere to certain criteria. However, when the market began paying closer attention to production cycles, certifications multiplied and proliferated. In Europe alone, there are now over 200 different certifications, each with its own set of standards and evaluation criteria, making comparability nearly impossible. This does not mean that all certifications are unreliable, but without a solid and shared foundation at least at the European level, understanding how to interpret and prioritize them is a daunting task. As a result, when the definition of what it takes to be certified is subjective, and based on the personal truth of each market operator, then the actions of brands relying on these certifications are equally relative.

The European Commission’s ambitious plans to standardize certifications, regulate green claims, and require scientific evidence in the coming years offer hope. If successful, these efforts could push brands to ensure transparency and authenticity in their practices.

But, even in such a scenario, would consumers truly be able to navigate these products effectively?

Today, clothing labels offer minimal information: raw material composition and country of origin. However, "Made in" labels can be highly misleading, as they do not necessarily indicate that all stages of production took place in that country. Often, only the final transformation of the fabric into a finished product occurs there (as we have seen with Stone Island in the survey analysis), while critical stages like dyeing and finishing—potentially the most polluting—remain unspecified. Even if future regulations mandate the inclusion of all such details, how will consumers be expected to understand them? It would take a global training course and several doctorates to grasp the implications of the more than 3,000 chemicals involved in the production of a single garment.

A legislative intervention is needed to address how such information shall be communicated. Clear messaging and intuitive symbols are essential to indicate which elements of a garment are harmful to the environment or human health. However, this requires further multidisciplinary studies to determine which substances are dangerous and from which perspective. Legislators must also work to establish communication guidelines that help consumers make sense of the information they are given.

Asking brands to provide more detailed information, covering a broader scope of activities and backed by empirical evidence, is a wasted effort if consumers are not taught how to interpret it. Without a common framework for understanding sustainability claims, consumers will shift from being cynical and distrustful to feeling confused and overwhelmed. Legislators must work toward creating a universal language that allows consumers to comprehend what they read, compare products, and ask the right questions before making their next purchase.

7.3 The role of consumers

At the end of the day, we can invest in circularity, explore cutting-edge recycling and recovery technologies, use eco-friendly and regenerated fibres, implement innovative production techniques, and communicate with complete transparency. But the truth is that changing the status quo without questioning our lifestyle is pure illusion.

As Matteo Ward aptly stated, consumers must be willing to "make quantitative sacrifices in favour of a qualitative well-being that is not immediately perceptible."
Brands know that the consumer's brain is wired for more frequent shopping, and many believe that they can continue doing so sustainably, thanks to advances in these areas. People convince themselves it's fine to keep buying because eco-progress marches on. They reason that the clothes they purchase are being made with less energy or water, and that with each passing day, shopping is becoming more 'eco-friendly.' Yet this mindset is the true barrier to progress, and it is the only factor that can truly make a difference.
Brands, driven by financial gain, will continue to do the bare minimum to comply with new regulations, while attempting to minimize any disruption to their current business model, as it remains highly profitable. The real effort falls on the consumer. They must learn to feel fashionable without adding new outfits to their wardrobe every week, without chasing the latest trends. Slowing down the fashion cycle has more power than any innovation or regulation to steer the industry toward a truly sustainable future.

The most revolutionary act for the future of fashion isn't buying better—it's buying less.

Bibliography

Smith P. (2024) *Global revenue of the apparel market 2018-2028*, Statista
Solidarity Center (2023) *Global Garment and Textile Industries. Workers, Rights and Working Conditions*
Gennari C. (2023) *Shein, Temu, and the others: the fast fashion race to the bottom*, Il Sole 24 Ore
Antriksh P. (2023) *Fast Fashion Market 2023-2030*
ESG Research Team, ECS Research Pro (2024) *ESG in the Fashion Industry: Navigating Sustainability, Ethics, and Profit*
ONU (2015) *Agenda 2030 per lo Sviluppo Sostenibile*
FdER (2022) *Come gli SDGs delle Nazioni Unite si relazionano all'Industria della Moda*
Costa C. (2024) *Moda sostenibile: che cos'è e perché scegliere la sustainable fashion*, ESG 360
Rauturier S. (2024) *Fashion's Water Impact: The Largest Brands Are Doing The Least*, Good on you
Fashion Journal FFRI (2021) *Pillole di sostenibilità: l'impronta idrica*
Mckinsey e Company (2024), *The State of Fashion 2024*
Deloitte (2024), *Fashion & Finance*
European Commission (2024) *Corporate sustainability reporting*
European Commission (2023) *EU strategy for sustainable and circular textiles*
European Commission (2020) *Economic and Social Committee and the Committee of the Regions*
European Commission (2024) *Ecodesign for Sustainable Products Regulation*
European Parliament (2012) Directive 2009/125/EC of the European Parliament and of the Council
European Commission (2023) *Green claims*
European Commission (2024) *Waste shipments*
European Union (2024) *Regulation 2024/1157 of the European Parliament and of the Council*
European Environment Agency (2024) *The destruction of returned and unsold textiles in Europe's circular economy*
Santi A. (2023) *Can clothes ever be fully recycled?,* Future Earth Newsletter
European Union (2023) *Directive 2008/98/EC of the European Parliament and of the Council*
European Commission (2023) *Waste Framework Directive*
Legislative Train Schedule (2024) *Revision of the Textile Labelling Regulation - Q4 2023*
European Parliament (2023) *Protecting environment and health: Commission adopts measures to restrict intentionally added microplastics*
European Commission (2023) *Commission Regulation (EU) 2023/2055 - Restriction of microplastics intentionally added to products*
European Environment Agency (2022) *Textiles and the environment: the role of design in EUROPE's circular economy*
Good on you (2024) *Fashion's Water Impact: The Largest Brands Are Doing the Least*
European Environment Agency (2023) *Textiles in Europe's circular economy*
ESG360 (2023) *L'impatto invisibile dell'industria tessile, l'UE si mobilita per la moda circolare*
European Environment Agency (2024) *Textiles and the environment: the role of design in Europe's circular economy*

Parlamento Europeo (2024) *L'impatto della produzione e dei rifiuti tessili sull'ambiente*
Comistra (2024) *Water pollution in the fashion industry*
Energy Tips Alperia (2023) *Acqua. L'insostenibile impronta idrica del fast-fashion*
Dress The Change (2021) *Il consumo dell'acqua nell'industria della moda*
Sodai (2024) *L'impatto della Fashion Industry sull'impronta idrica mondiale*
Maiti R. (2024) *Fast Fashion and Its Environmental Impact,* earth.org
Allianz Trade (2021) *Settore moda e recupero di rifiuti tessili*
European Parliament (2024) *The impact of textile production and waste on the environment*
Grammen C. (2024). *73% of the textile waste is burned or dumped. Circolar Economy in the Textile Sector*, Wanderful.Stream
De Ceglia V. (2023) *L'industria della moda e la sfida globale contro il climate change*, La Repubblica
Chen X., Memon H.A., Wang Y., Marriam I., Tebyetekerwa M. (2021) *Circular Economy and Sustainability of the Clothing and Textile Industry*, Mater Circ Econ.
Chiavacci I. (2022) *La sovrapproduzione è il problema più grande della moda,* Lifegate
Businesswaste.co.uk (2024) *Fashion Waste Facts and Statistics*
Ellen MacArthur Foundation (2017) *A New Textiles Economy: Redesigning Fashion's Future*
Lombardi V. (2023) *L'impatto del settore moda sulla biodiversità secondo Textile Exchange*, Cikis Studio
Comunale D., Neri V. (2023) *Moda e biodiversità sono più legate di quanto sembri*, Lifegate daily
Poratelli F. (2022) *Tessuti naturali, artificiali e sintetici: in cosa differiscono?* Cikis Studio
A good company (2023) *Fast Fashion: The Environmental and Social Impact*
Real Thread (2024) *The Impact of Sustainable Fashion on Local Communities and Artisans*
The Lowest Wage Challenge (2019) *State of the Industry: Lowest Wages to Living Wages*
Sustain Your Style (2024) *Inhumane working conditions*
Siccardo A. (2024) *RanaPlaza, 11 anni dopo. In Bangladesh persistono le cause della tragedia,* Altreconomia
European Parliament (2014) *Worker's conditions in the textile and clothing sector: just an Asian affair? Issues at stake after the Rana Plaza tragedy*
Gazieva M. (2023) *'It was very secret': Uncovering wounds of forced labour in Uzbek cotton*, openDemocracy
Perinelli C. (2024) *Green Washing nella Moda: Un Nuovo Rapporto Smaschera i Grandi Marchi*, Vesti la natura
Licata P. (2024) *Moda sostenibile, la tecnologia porta i brand del fashion nella transizione verde*, Network Digital 360
Bressanelli G., Ioli M., Saccani N. (2021) *Avvicinarsi all'Economia Circolare nell'Industria Tessile: il Caso Punto Art*, Network Digital 360
Nayak R., Jajpura L., Khandual A. (2023) *Traditional fibres for fashion and textiles: Associated problems and future sustainable fibres*, Since Direct, p. 3-25
Texitle Exchange (2023) *Materials Market Report*
EconomiaCircolare.com (2023) *Moda e greenwashing, Greenpeace: "Così i brand mascherano il fast fashion con le etichette verdi"*
Gambi S. (2021) *Cos'è l'Higg Index, come funziona e perché sta diventando così importante*, SoloModaSostenibile

Fant S. (2022*) Greenwashing, l'indice di sostenibilità che promuove le fibre sintetiche per i big del fashion*, EconomiaCircolare.com
Testoni L. (2021) *La sfida sostenibile delle grandi catene. Uniqlo 'cancella' il fast fashion*, Pambianco news
Tangredi V. (2020) *come verificare la reale sostenibilità di un brand,* dressthechange.org
Caminati S. (2023) *Patagonia: marchio sostenibile, o no?,* water(on)line
Godfrey M. (2024) *What Fuels Fashion*?, Fashion Revolution
Gadeschi E.F. (2022) *La classifica delle aziende di moda più sostenibili*, Elle
Perinelli C. (2023) *Zara, l'impero da 20 miliardi basato sulla Fast Fashion*, Vesti la natura
Ferrera M. (2023) *Circular Fashion Index, Gucci è il brand di lusso più sostenibile*, e-campus Università Blog
Coppola D. (2024) *E-commerce as share of total retail sales worldwide 2021-2027*, Statista
Green Marketing Italia (2023) *Gucci e la sostenibilità: quando la moda è green*
Chan E. (2022) *Per Gucci il futuro della moda è circolare. Anzi, rigenerativo*, Vogue Italia
Il Fatto Quotidiano (2024) Armani *e Dior nel mirino dell'Antitrust: "Enfatizzano l'eccellenza dei prodotti ma i loro fornitori sfruttano i lavoratori*"
Naef I. (2023) *Sostenibilità: Patagonia, Levi's e The North Face sul podio*, Fashion United
Circular Fashion Index (2024), *2023 Gucci si conferma il luxury brand più green* Pambianconews
Tuzio A. (2020) *Il nuovo programma di Levi's dedicato alla sostenibilità*, Collater.al
Santoruvo C. (2023) *Stella Mc Cartney: come comunica la sua sostenibilità?,* Tamtaming Linkedin
Bonameta G. (2024) *Perché la moda sostenibile costa di più della fast fashion?,* quifinanza.it
Andreetta E., Cadamuro O. (2023) *Re-fiber: il futuro delle fibre tessili è sostenibile*, pwc.com/it
Cabascia E. (2024) *Non è tutto green quel che luccica. La sostenibilità nell'alta moda,* EconomiaCircolare.com
Ilpost.it (2023) *La "fast fashion" di mezzo mondo finisce in questa discarica in Cile*
Ambiente Mare Italia (2023) *Montagne di vestiti usati sommergono il Ghana*
H&M Group (2019) *Garmet collecting: from throwaway to here to stay*
Ward M. (2024) *FUORIMODA! Storie e proposte per restituire valore a ciò che indossiamo* DeAgostini