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Sustainability in the Fashion Industry: The Key Role of Traceability for Responsible Companies

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Alla mia famiglia,

che mi accompagna lungo la mia strada.

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Introduction

In January 2020 Davos (Switzerland) hosted, as every year, the World Economic Forum Annual Meeting, an event that brings together companies, leaders, actors and numerous other influential personalities on a global level to talk about topics particularly relevant for the World economy. This year, the title chosen for the meeting was "Stakeholders for a Cohesive and Sustainable World". For the first time in this event, the term *stakeholders* was used instead of *shareholders*, marking an epochal change in the paradigm of capitalism. The choice of the term indicates that the creation of value for shareholders must no longer be the sole purpose of companies. Firms and organizations must also invest in their employees, protect the environment, behave correctly and ethically with suppliers, and create long-term value. The central theme of the discussions was therefore the climate change, understood as a global problem linked to the economic activities of governments and companies and which can be solved thanks to a global commitment to circular economy and reduction of emissions. The choice to focus an economic meeting on the topic of sustainability indicates that it is now a necessary condition towards which not only governments and citizens, but above all companies must strive. For too long the planet has been polluted in the name of a short-term gain, believing that resources were unlimited and that we would never pay the consequences, but climate change, environmental disasters and social scandals have affected people's perception and changed their way of life. It was first this change of mentality by consumers, with their purchasing power, which forced companies to consider not only profit, but also their impact on people and environment. The *Paris Agreement*, the first-ever universal and legally binding global climate deal, played a key role in increasing the importance of sustainable development issues. The aim of the agreement is to limit global warming by reducing emissions. It was signed in 2016 within the United Nations Framework Convention on Climate Change (UNFCCC), which was attended by 196 countries and over 19,000 representatives, indicating the importance of the theme. In the same year, the 2030 Agenda for Sustainable Development was launched by the United Nations and includes 17 *Sustainable Development Goals* (SDGs) that aim to reach 169 specific targets to solve a wide range of issues concerning

economic, environmental and social development worldwide. The greatest result achieved with these agreements was to connect clearly and universally climate change with human activities. In this perspective, World leaders have recognized that climate change is a real fact and represents an environmental, economic and social threat. All the events mentioned have contributed and are contributing to change the way many companies operate, leading them towards a more responsible behaviour driven by the Elkington theory of the *Triple Bottom Line.* According to this approach, in order to reach a sustainable development companies must act by combining economic, social and environmental objectives together in a long-term perspective. Profit becomes a means to an objective, not anymore the objective itself. We talk about sustainable development when it meets the needs of present generation without compromising the ability of future generations to meet their needs. This development must be achieved through a collective commitment, which concerns every country, market, company and person in the World.

Recognizing the central role that the sustainability issue has now and will have in the future, I decided to contextualize it in the fashion industry, as it is part of the lives of the majority of people worldwide and because it is the second most polluting sector in the World. Sustainability can be considered both a challenge and an opportunity, because it requires an intensive amount of resources and implies high costs to be realized, but offers internal and external advantages, both in economic and non-economic terms. On one side, integrating sustainability into the corporate strategy reduces the damage to the environment and people, while on the other side it improves company's reputation by attracting customers and stakeholders and encourages innovation. In particular, for the fashion industry the circular economy defined by the Ellen Macarthur Foundation is a sustainable solution regarding every aspect of the supply chain and regenerative by intention, from the design to the reuse of components, which allows to extend the life cycle of the product and take full advantage of the innovation of materials. Sustainability problems related to the fashion industry regards the ethical scandals linked to working conditions and the environmental damage caused by an irresponsible supply chain. These conditions arise from the globalization of production, which is the cause of the current complexity and opacity of fashion supply chains. Having processes and products

distributed worldwide means that there is no accountability for social and environmental damages and that monitoring the supply chain becomes more difficult.

Starting from this problem, the aim of this elaborate is to demonstrate the importance of traceability as a pre-condition to sustainability in the fashion industry. The UN Global Compact defines traceability as the "ability to identify and trace the history, distribution, location and application of products, components and materials, to ensure the reliability of declarations of sustainability in the areas of human rights, work (including health and safety), environment and anti-corruption". It is both the starting point for internal efficiency and for external communication. On one side, it allows for an evaluation of the supply chain, in order to understand critical steps in terms of sustainability and improve them using circular economy and innovations regarding products and processes. The advantages are an efficient supply chain, an improved resource management and an effective reputational risk management. On the other side, traceability allows companies to be transparent with stakeholders, building trust in the brand. Transparency is both an objective to achieve in order to cope with consumers' needs and a tool for change towards a more responsible and sustainable supply chain. As said during the World Economic Forum 2020 meeting, companies must consider not only profit for shareholders, but also their bond with the stakeholders. This thesis aims to demonstrate that, according to what said before, traceability is a tool that fashion companies should use in order to achieve a sustainable production, which, according to the Triple Bottom Line approach, regards the economic, social and environmental aspect. Traceability allows companies to solve the problem of the loss of control on their supply chain, limiting ethical scandals and environmental damages, but also to be more efficient in processes and transparent towards stakeholders, which can bring an economic gain. It allows to combine the environmental and social gain needed by people and planet with the economic gain needed by the company. Like the food and beverage sector, also the fashion industry can benefit from supply chain traceability, but there is a need for a radical change that involves all stakeholders. The environmental and ethical damage that the fashion industry has caused in these years must be reduced, and traceability is a necessary condition for this objective.

The first chapter deals with sustainability in general and then contextualized in the fashion sector, with the aim of highlighting what governments and companies are already doing and can do in favour of it. The second chapter focuses on traceability and transparency, starting from the problem of the complexity of fashion supply chains. Traceability is considered in relation to sustainability, and aimed at it, also considering the efficiency gain for companies. The chapter presents the advantages deriving from traceability and gives some guidelines to follow in order to implement it, illustrating the main technological innovations in the field. Finally, two case studies successfully applying it in their value chain are presented: Patagonia, Inc. and Monnalisa S.p.A., both belonging to the fashion industry. The third chapter is an analysis of four Italian small and medium-sized companies working in the footwear sector made in collaboration with the research laboratory and project with firms "Tracciabilità per la sostenibilità: valore economico e design" by Ca' Foscari University of Venice and IUAV University of Venice. These companies are committed to implement traceability systems in order to improve their sustainability. The case studies are presented through qualitative interviews and then analysed in terms of sustainability performance using economic, social and environmental indicators in order to provide some examples of application of traceability in relation to sustainability.

1. Sustainability in the fashion industry

1.1 Introduction to sustainability

The first discussions about the concept of sustainability took place in 1972 during the United Nations Conference on the Human Environment in Stockholm. During the conference, 113 national representatives came from developed and developing countries to meet 400 government organizations, with the aim to face global environmental problems together. The meeting agreed upon a Declaration containing 26 principles concerning the environment and development, an Action Plan with 109 recommendations and a Resolution. The UNEP – United Nations Environment Programme – was established. In 1980 the UNEP, together with the WWF and the International Union for Conservation of Nature (IUCN), elaborated the World Conservation Strategy, an international document for the global resource management. The purpose of the document was to coordinate and spur the countries to obtain a sustainable development, and in particular to "maintain essential ecological processes and life-support systems, preserve genetic diversity, ensure the sustainable utilization of species and ecosystems".[1]

The concept of sustainable development has been defined for the first time with the Brundtland Report, also known as "Our common future", in 1987, released by the World Commission on Environment and Development (WCED)[2] and published by the United Nations. The objective was to work in conditions of interdependence and place environmental issues on the political agenda. Sustainable development is defined as "the development that meets the needs of present generation without compromising the ability of future generations to meet their needs".[3] The definition emphasises the

[1] IUCN, UNEP, WWF, *World Conservation Strategy: Living Resource Conservation for Sustainable Development*, 1980, p.7.
[2] The WCED is also known as the Brundtland Commission and was founded for the cooperation of countries towards sustainable goals.
[3] World Commission of Environment and Development, *Report of the World Commission on Environment and Development: Our Common Future,* United Nations, 1987, p.37.

long-term aspect of sustainability and introduces the ethical principle of achieving equity between present and future generations. The notion of sustainable development was also accepted in the environmental treaties of Rio (Brazil): the Convention on Climate Change, which came into force in 1994, the Convention on Biological Diversity, which came into force in 1993, and the Johannesburg Conference in 2002. These treaties report a configuration of the principle of sustainable development based on three interdependent factors: environmental protection, economic growth and social development. Environmental sustainability was intended as the maintaining of quality and reproducibility of natural resources; economic sustainability as the ability to create income and jobs for the sustenance of population; and social sustainability as the ability to grant human wellbeing, equally distributed among people. These three components define the concept of sustainability, and are informally referred to planet, profit and people. The principle of the Triple Bottom Line (detailed in section 1.1.1) says that to completely solve the problem of an unsustainable development all these three pillars must be sustainable. Moreover, sustainability implies responsible and proactive decision-making and products and processes innovation that minimizes negative impact on the environment and maintains balance between it, economic returns and social welfare. The Brundtland Report is pessimistic, World economy is destroying our Planet and a change is necessary: "our failure to do so will not be forgiven by future generations".[4]

Sustainability regards not only nations, governments and public firms, but also private companies and people. The commitment of a single person must be sustained by firms and governments, which can really make the difference for our Planet. We live and behave as if we had infinite resources available, but this is not. Firms and governments must understand that a change is needed, that profit can't be the only objective. This awareness about the matter of sustainability has changed the rules of the markets, because consumers are moving toward a more conscious consumption and, consequently, firms are moving toward a more conscious production. During his speech at the 2014 Climate Summit to the United Nations, Leonardo Di Caprio, American actor

[4] World Commission of Environment and Development, *Report of the World Commission on Environment and Development: Our Common Future,* United Nations, 1987, p.115.

and UN Ambassador of Peace, said: "now think about the shame that each of us will carry when our children and grandchildren will look back and realize that we had the means of stopping this devastation, but simply lacked the political will to do so".[5] This sentence focuses on the same aspects of the definition of sustainable development: long-term vision and respect for the future of other generations and of our Planet. Modern society now is aware of the environmental and social cost that its actions have caused and is causing, aware of the global ecosystem decline ad aware of the responsibility that men have on the environment. Faced with this awareness, governments and companies must plan and predict actions that could fight the negative impacts on planet and people.

1.1.1 The Triple Bottom Line theory

The concept of sustainability incorporates many meanings and principles, when talking about business. John Elkington, founder of the international organization SustainAbility[6], in 1994 stated that companies should measure value not only through a financial bottom line, including profit or loss, but also through a social and environmental bottom line.[7] The concept has evolved in the definition of sustainability as the place where economics, social realities and environmental health overlap. The importance of the three elements is equal, indicating that economy has the same relative value of the other two elements, society and environment. Economic decisions are part of the strategy to make more money, while getting closer to social and environmental sustainability. Profit is a means to an objective, not the objective itself. The Triple Bottom Line (TBL) represents the idea of a system composed of:

[5] Quote taken from "Before the flood", a 2016 documentary film about the climate change produced by Fisher Stevens and Leonardo Di Caprio which shows the effects of global warming over the Earth and explains the role that politicians and multinational companies have had and currently have in this matter.

[6] SustainAbility is a think tank company founded in 1994 by John Elkington to inspire and enable businesses to become sustainable. Source: https://sustainability.com/who-we-are/

[7] Elkington J., *Cannibals with Forks. Triple Bottom Line of 21st Century Business,* Capstone Ltd., 1997.

- People, including workers and human rights, local communities and society, relationships with suppliers, anticorruption and fair practices;
- Planet, including natural resources as finite goods that must not be wasted or abused, but used with care and respect, and impacts on the environment;
- Profit, the economic gain of a company.

Figure 1: Triple bottom line. Source: personal elaboration.

A company, in order to generate results and gain competitive advantage in the medium term, must set its own business strategy by "mixing" these three variables (the 3 Ps). It can achieve the long-term balance only if integrates the short-term economic objectives, essential for capital and work, with non-economic objectives regarding environment and society. The Elkington theory of Triple Bottom Line aims to create an assessment model of a company's strategy, including in its logic the theory of sustainability. As stated in the report "The Future we want" from the United Nations Conference on Sustainable Development in Rio De Janeiro (2012) only a balanced integration, consistent and coordinated, avoiding duplication of effort and monitoring progresses, can lead to the achievement of a sustainable development.[8]

[8] United Nations, *The Future We Want. Outcome Document on The United Nations Conference on Sustainable Development,* Rio De Janeiro (Brazil), 2012, p.19.

A further attempt to categorization of the sustainability dimensions was made by the Sustainability Society Foundation (SSF)[9], which defines the social aspect referring to human wellbeing and social performance, that include basic needs, personal development and a well-balanced society; the environmental aspect related to a healthy environment, climate and energy, and natural resources; and the economic aspect referred to future and economy. This approach presents a new consideration of the three dimensions: the economic well-being is not considered as an objective, like social and environmental wellbeing, but as a condition for the development of the other two dimensions. Profit serves as a safeguard for social and environmental welfare. The Sustainable Society Foundation has developed also a Sustainable Society Index (SSI), joining the three wellbeing dimensions, and used for monitoring the progresses of a country in its achievement of sustainability and for setting priorities regarding society, environment and economy. It includes 8 categories and 24 indicators, used to obtain an average score which determines the level of sustainability.[10]

Other studies have been done in order to measure the three dimensions of sustainability. Only profit can be easily measured in dollars, while quantifying social capital and environmental health of a company can be very difficult. Some suggests for monetizing all dimensions, but there are objections to putting a dollar value on things that can't be evaluated in monetary terms (for example endangered species or social welfare). Another solution would be to calculate the Triple Bottom Line in terms of an index. According to the Indiana Business Review, this eliminates the issue of incompatible elements and allows for a better comparison between them.[11] As suggested by the University of Scranton, by identifying alternative measurements of impacts, organizations can measure sustainability performance as well as methodology. Social variables can embody measurements of education, access to resources, health, equity, social capital, and quality of life (for example median household income, unemployment rate and female labour participation percentage). Environmental factors

[9] The Sustainable Society Foundation is a non-profit organization established in 2006 with the objective of stimulating and assisting societies in their development towards sustainability. Source: http://www.ssfindex.com/about-ssf/

[10] Sustainable Society Foundation Index, http://www.ssfindex.com/ssi/framework/

[11] Slaper T.F., Hall T.J., *The Triple Bottom Line: What Is It and How Does It Work?,* in "Indiana Business Review", 2011.

reflect natural resources and viability: air quality, water quality, available natural resources, energy consumption, waste, land cover and land use can all be measured and tracked. [12] Businesses and organizations should select a sustainability index that is meaningful, measurable, relevant, and comprehensive. To determine and document success, a company must set objectives and goals, because while it is relatively easy to define Triple Bottom Line, tracking its success can be difficult. Anyway, there is no universal standard method for calculating the Triple Bottom Line, because it can be used by different businesses of different sizes, types, industries. Moreover, measurements are influenced by stakeholders, experts and data availability.

Fortunately, the scenario is moving toward a more conscious and sustainable development, with a full awareness about the importance of people and planet, together with profit. On August 2019, the Business Roundtable, an association made up of 257 managing directors of the main American companies, presented a new Statement on the Purpose of a Corporation signed by 181 CEOs who are committed to guide their companies for the benefit of all their stakeholders: customers, employees, suppliers, communities and shareholders. The CEOs who signed the statement believe that free market is the best way to generate jobs, sustainable development, innovation and wellbeing of workers. The new statement is an important break with the traditional economic doctrine of capitalism, according to which the sole purpose of the business is to generate and maximize profits for shareholders, and shifts the attention toward people and planet, with benefits for employees and environment. The good intentions contained in the Business Roundtable declaration are certainly an important step forward, but there is no certainty about how the CEOs will implement these objectives and integrate them in their strategy.

[12] University of Scranton, *Ideas for Creating an Index to Measure Triple Bottom Line*. For further information: https://elearning.scranton.edu/resource/business-leadership/ideas-for-creating-an-index-to-measure-triple-bottom-line

1.1.2 Commitment of countries for a sustainable development: main measures and the 2030 Agenda for Sustainable Development

In the last twenty years most countries, especially the developed ones, have achieved an awareness about the effects of their politics over the planet, and have decided to commit themselves in the reduction of pollution and damages to the environment. Among the most important agreements there are the Kyoto Protocol and the Paris Agreement, which have marked a turning point in achieving sustainable development.

The Kyoto Protocol is an international treaty that extends the 1992 United Nations Framework Convention on Climate Change (UNFCCC), which commits States members to reduce greenhouse gas emissions based on the scientific consensus that global warming is occurring and it is extremely likely that human-made CO2 emissions have predominantly caused it. The protocol was adopted in 1997 and has entered into force in 2005. Currently, 175 States have ratified it. The Protocol is based on the principle of common but differentiated responsibilities: individual countries have different capabilities in fighting climate change, owing to economic development. The obligation to reduce emissions regards developed countries, on the basis that they are historically responsible for the current levels of greenhouse gases in the atmosphere. Developing countries are not subjected to protocol obligations. For two reasons: on one hand because they polluted less than the industrialized countries, and on the other hand because the economic and social development and the fight against poverty were considered priorities over greenhouse gas emissions. The Protocol's first commitment period started in 2008 and ended in 2012, and a second commitment period is in progress from 2013 to 2020. In the first period of the Protocol (2008-2012), participating countries committed to reduce their emissions by an average of 5% below 1990 levels. From an environmental point of view, the Kyoto Protocol was certainly an important first step, but the results were not entirely satisfactory. During the first phase, between 2008 and 2012, it is not clear whether the signatory countries, while managing to reduce their emissions, have actually achieved their objectives. The main problem is certainly

that some of the most responsible States for greenhouse gas emissions, China, India and the United States, have not been required to comply with the protocol. China and India, which were among the signatory States, had the status of developing countries, while the United States have never ratified the protocol. The protocol only covers about 18% of global emissions.[13]

The Paris Agreement sets out to improve upon and replace the Kyoto Protocol. It is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC) dealing with greenhouse-gas-emissions mitigation, adaptation, and finance, signed in 2016. It is the first-ever universal and legally binding global climate deal. Its long-term goal is to limit global warming well below 2 °C above pre-industrial levels and to limit the increase to 1.5 °C, since this would substantially reduce the risks and effects of climate change. Under the Paris Agreement, each country must determine, plan, and regularly report on the contribution that it undertakes to mitigate global warming. Governments commit to "come together every 5 years to set more ambitious targets as required by science", "report to each other and the public on how well they are doing to implement their targets" and "track progress towards the long-term goal through a robust transparency and accountability system".[14] The Countries will submit updated climate plans – called Nationally Determined Contributions (NDCs) – every five years, steadily increasing their ambition in the long-term. The agreement also recognizes the role of stakeholders in addressing climate change, including cities, regions, private sectors and others, which are invited to reduce emissions. The Paris Agreement underwrites adequate support to developing nations and establishes a global goal to significantly strengthen adaptation to climate change through support and international cooperation. In June 2017, U.S. President Donald Trump announced his intention to withdraw the United States from the agreement, and the effective date of withdrawal is November 2020. In spite of the pending exit by the U.S., 185 countries had both signed and ratified the agreement by September 2018.

In addition to these measures aimed at protecting environmental sustainability, there are also bodies that safeguard social sustainability, because in presence of inequalities

[13] European Commission, https://ec.europa.eu/clima/policies/strategies/progress/kyoto_1_en
[14] European Commission, https://ec.europa.eu/clima/policies/international/negotiations/paris_en

and in absence of social cohesion, economic and environmental sustainability cannot be realized. It involves work and human rights, anti-corruption and fair practices among companies and markets, development of local communities, responsibility for products and consumers and relationships with suppliers along the value chain. In particular, the International Labour Organization (ILO) is a specialized agency of the United Nations that deals with promoting social justice and internationally recognized human rights, with particular reference to those concerning work in all its aspects. It was the first specialized agency to be part of the United Nations system in 1946, but its foundation dates to 1919 within the League of Nations. It brings together governments, employers and workers representatives of 187 member States. The main role of the ILO is to formulate the international minimum standards of working conditions and fundamental rights of the worker, including: freedom of association, right to organize, collective bargaining, abolition of forced labour, equal opportunities and treatment and other regulations. The ILO also provides technical assistance mainly in the following areas: vocational training and rehabilitation, employment policies, labour administration, labour law and industrial relations, employment conditions, development management, cooperative development, social security, statistics of work, safety and health at work. Finally, it promotes the development of organizations of workers and independent employers and provides training and consultancy services to these bodies.[15]

To support the ILO, in June 2011, the United Nations Human Rights Council (UNHRC)[16] has adopted the "Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework", which suggests an innovative approach to face the impact of multinationals' activities on human rights. "Protect" means that the State must safeguard against human rights violations by third parties, "Respect" means to act diligently and is referred most of all to companies, "Remedy" involves the responsibility that firms and States have to improve the possibility of victims to appeal, both judicially and non-judicially. The framework represents part of government's attempts to protect against human rights abuses by

[15] ILO, https://www.ilo.org/global/about-the-ilo/lang--en/index.htm

[16] The UN Human Rights Council is an inter-governmental body within the United Nations system made up of 47 States responsible for the promotion and protection of all human rights worldwide. Source: https://www.ohchr.org/en/hrbodies/hrc/pages/home.aspx

business enterprises, by asking for corporate policies, actions and strategies involving human rights to be devised and published.

The importance of decent work is highlighted also in the 2030 Agenda for Sustainable Development, an action program for people, planet and prosperity signed in September 2015 by the governments of the 193 United Nations (UN) member countries. It is important because involves all the aspects of sustainability and every country in the Wold, with a single common goal: reach a sustainable development. It includes 17 Sustainable Development Goals (SDGs, figure 2) which aim to reach 169 specific targets to solve a wide range of issues concerning economic, environmental and social development, such as poverty, hunger, health, education, climate change, gender equality, water, sanitation, energy, urbanization, environment and social equality.[17] The official launch of the SDGs coincided with the beginning of 2016, guiding the World on the road ahead over the next 15 years: countries, in fact, have committed themselves to reach them by 2030. The 2030 Agenda is universal in its application, because it doesn't make a distinction between developed and developing countries, which are equally involved in achieving the goals. The objectives are interconnected and regards all the dimensions of sustainable development: economic, social and environmental. To support the activity and guarantee the comparability of the evaluations, the Statistical Commission of the United Nations has established the Inter Agency Expert Group on SDGs (IAEG-SDGs)[18], with the task of defining a set of indicators for monitoring the implementation of the Agenda 2030 on a global level. Every year, States can present the status of implementation of the 17 SDGs in their country, through the preparation of Voluntary National Reviews.

[17] Sustainable Development Goals. Knowledge Platform, https://sustainabledevelopment.un.org/sdgs
[18] The Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs) is composed of Member States and including regional and international agencies as observers. Source: https://unstats.un.org/sdgs/iaeg-sdgs/

Figure 2: Sustainable Development Goals. Source: United Nations.

2016 marks the first year of the implementation of the SDGs. The objectives of the 2030 Agenda are:

- Promote a sustainable and long-term economic growth;
- Protect the planet through a conscious production and consumption, a right management of resources and measures to fight climate change;
- Give value to people, granting them equal rights and education and fighting poverty;
- Spread peace and end war;
- Promote solidarity and cooperation around the World.[19]

In 2019 at the top of the rankings we find Denmark, Sweden and Finland; in the last Congo, Chad and Central African Republic.[20] In 2018 Oxfam has published the "Walking the Talk 2018" report, which analyses what 76 of the World's largest private companies are doing to embrace the SDGs. The sample examined includes international companies from eight industrial sectors: energy, banking, technology, agri-food, clothing, mining, food and beverage and the pharmaceutical sector. The situation, according to Oxfam's

[19] United Nations, https://www.un.org/sustainabledevelopment/development-agenda/
[20] Sachs J., Schmidt-Traub G., Kroll C., Lafortune G., Fuller G., *Sustainable Development Report 2019. Transformations to Achieve the Sustainable Development Goals*, Bertelsmann Stiftung and Sustainable Development Solutions Network, 2019, p. 20.

assessments, seems to be negative for the moment: the introduction of the SDGs has not changed the companies' approach to corporate sustainability. Only in a couple of cases firms included the 17 Objectives within the guidelines for defining their own sustainability strategy. Anyway, about half of them have information on future actions or objectives related to the 17 Objectives. The SDGs most supported by the companies analysed on the report are the number 8 - decent work and economic growth -, the number 13 - climate action -, and the number 3 - good health and well-being (figure 3).[21]

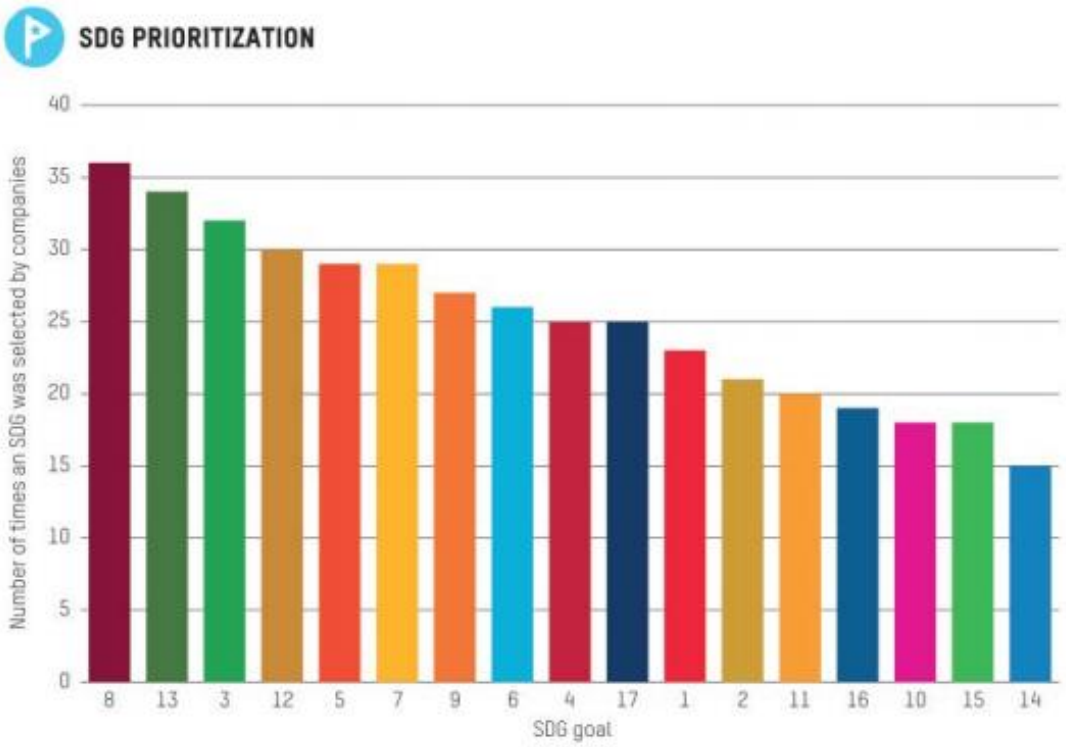

Figure 3: SDGs prioritized by companies. Source: "Walking the Talk 2018" report.

Achieving the SDGs requires the partnership of governments, private sector, civil society and citizens alike to make sure we leave a better planet for future generations.

[21] Mhlanga R., Gneiting U., Agarwal N., *Walking the Talk: Assessing Companies' Progress from SDG Rhetoric to Action,* Oxfam, 2018.

1.1.3 Commitment of companies for a sustainable development: Corporate Social Responsibility

Sustainability is increasingly becoming a determining part of the strategies of many companies and finds its implementation in Corporate Social Responsibility (CSR). The main cause of the birth of this concept is the need for a company to be competitive in a market that requires to be responsible. The European Commission defines Corporate Social Responsibility as "the responsibility of enterprises for their impact on society", "by integrating voluntarily social, environmental, ethical, consumer, and human rights concerns into their business strategy and operations, and by following the law".[22] CSR aims to ensure that companies conduct their business in a way that is ethical. This means taking account of their social, economic and environmental impact towards the stakeholders. The definition of the European Commission specifies another principle of CSR, the character of voluntariness: the actions carried out in the logic of social responsibility will therefore be characterized by actions carried out beyond the law, but in a spirit of real interest in taking charge of the environmental and social consequences produced. The main fields of application of CSR in a company are:

- Markets, where a company needs to be sustainable in the relationship with its suppliers, working together for a responsible supply chain, and with its customers, which are willing to pay more for a sustainable product;
- Working environment, with a sustainable human resource management with the objective to hire and train socially and environmentally responsible people, creating a sustainable business culture and building a healthy working environment;
- Local communities, in which the CSR has the role to create durable relationships and strengthen interactions with them, promoting a sustainable development in the territory;
- Environment, with the awareness that companies should take actions for the conservation of natural resources, reducing energy consumption and emissions

[22] European Commission, *Green paper. Promoting a European framework for Corporate Social Responsibility*, 2001, p.7.

level, thus limiting the production of waste and pollution, and that they should plan and implement the control and the improvement of environmental performance throughout the value chain;

- Communication, which allows the company to communicate the application of CSR objectives to internal and external stakeholders with fairness, reliability, veracity, comparability, clearness, accuracy and relevancy.

Nowadays, a company is asked to adopt a socially responsible behaviour, monitoring and responding to the economic, environmental and social expectations of all the stakeholders, with the aim of also gaining a competitive advantage and maximizing long-term profits. A product is not only appreciated for its functional characteristics, but also for its non-material characteristics, such as supply conditions, post-sale services, history and background. The growing attention toward CSR is due to different factors, coming both from demand and offer: awareness of the shortage of resources in our planet, a more conscious consumer, globalization and delocalization of production, scandals about child labour arising the theme of the right working conditions, and wide availability of information. The result is a growing interest toward transparency and traceability, requested by the stakeholders, including customers. An example of this need comes from the financial world, with the creation of the Dow Jones Sustainability Indexes, which include only companies proving to meet certain socio-environmental requirements. These indexes have helped to promote the development of environmental sustainability especially among big enterprises listed on the stock exchange. Transparency has become one of the keywords towards which the fashion system should turn. After years of collecting personal data on consumers' buying habits, the time has come for companies to be equally clear and to openly communicate the greatest amount of information concerning them and the production chain. Consumers want to support brands that "act well" and if you don't get his trust, you don't keep the customer relationship long. The majority of consumers, especially millennials, collect information about the brand, its products and its background before purchasing, and this has a great influence on their choice of buying or not. According to McKinsey, there are three guiding principles that companies can follow to implement CSR in their strategy and fully exploit the value return in the business:

- Concentrate the CSR efforts, identifying areas with the greatest opportunities to interact with the society and then concentrating here time and resources to create the potential for mutual benefits;
- Build a deep understanding of the benefits, being able to find a balance between the two parties and understanding the importance of both the economic and the social perspectives;
- Find the right partners and build long-term relationships with them.[23]

After understanding how to integrate CSR in the business strategy, a company needs dedicated human resources for its implementation. In order to support and put in practice the objectives of CSR, a new type of management has born: the sustainable management. It is the practice of managing a firm's impact on the Three Bottom Lines—people, planet, and profit—so that all three can prosper in the future. It is the intersection of business and sustainability, and it is preventative rather than reactive. Sustainable managers make efforts to change their company mindset, driving it toward a more conscious and sustainable behaviour. Depending on the size of the organization and their position, they may be responsible for ensuring compliance with environmental regulations, researching sustainable policies and initiatives, setting sustainability performance goals that are strategic and ambitious, proposing initiatives as well as the business case for sustainability to leadership, building awareness of sustainability programs within the company, managing initiatives and leading a team that implements them, measuring and reporting the effectiveness of sustainable initiatives. For example, they can promote the reduction of plastic materials or the production of packaging, or they can monitor to ensure the right working conditions in suppliers' factories, or they can propose investments in sustainable products or involve other employees in environmentally friendly projects. To be successful, a manager needs to be able to control issues and plan solutions that will be sustainable, having a long-term mindset. This type of management has developed in the last century, with the increasing interest toward environmental problems. It has become the link between sustainability as a

[23] Keys T., Malnight T.W., van der Graaf K., *Making the Most of Corporate Social Responsibility*, in "McKinsey & Company", 2009.

vision and sustainability in practise and helps to boost the reputation of the company in front of consumers and stakeholders.

In conclusion, a company needs to balance sustainability and profit, and consider its social role in the strategy used to gain competitive advantage. CSR must move firms toward innovation and encourage to improve performances, while reducing social and environmental damage.

1.2 Sustainability and the fashion industry

The fashion industry includes mainly clothing, but also footwear and fancy goods. The sector is distributed in a global structure in which production and consumption often occur in different countries or continents. The supply chains develop in all the World's territory and are composed of many sub-sectors which, in different countries, produce and process raw materials, semi-finished products and finished products. According to "The State of Fashion 2019" report by McKinsey&Company, in 2019 fashion players "need to take an active stance on social issues, satisfy consumer demands for ultra-transparency and sustainability, and, most importantly, have the courage to "self-disrupt" their own identity and the sources of their old success in order to realise these changes and win new generations of customers". [24] After a strong performance in 2018 (industry growth of 4 to 5 percent), in 2019 the fashion sector is predicted to slow slightly, with a growth of 3.5 to 4.5 percent, with Europe and US facing a slowdown and China expecting to become the largest fashion market in the World. This is due to the speed of changing of the industry, and in particular to new technologies and new markets that are emerging. According to executives interviewed for the State of Fashion 2019 report, the perceived reasons of this slowdown depend also on the impact of 2018 trends on the consumer, with the most impactful related to technology, followed by sustainability credibility (figure 4). For the first time, sustainability is one of the most

[24] Amed I., Berg A., Balchandani A., Andersson J., Hedrich S., Young R., *The State of Fashion 2019*, McKinsey&Company, 2018, p. 11.

important challenges and an essential feature requested in a fashion company's strategy.

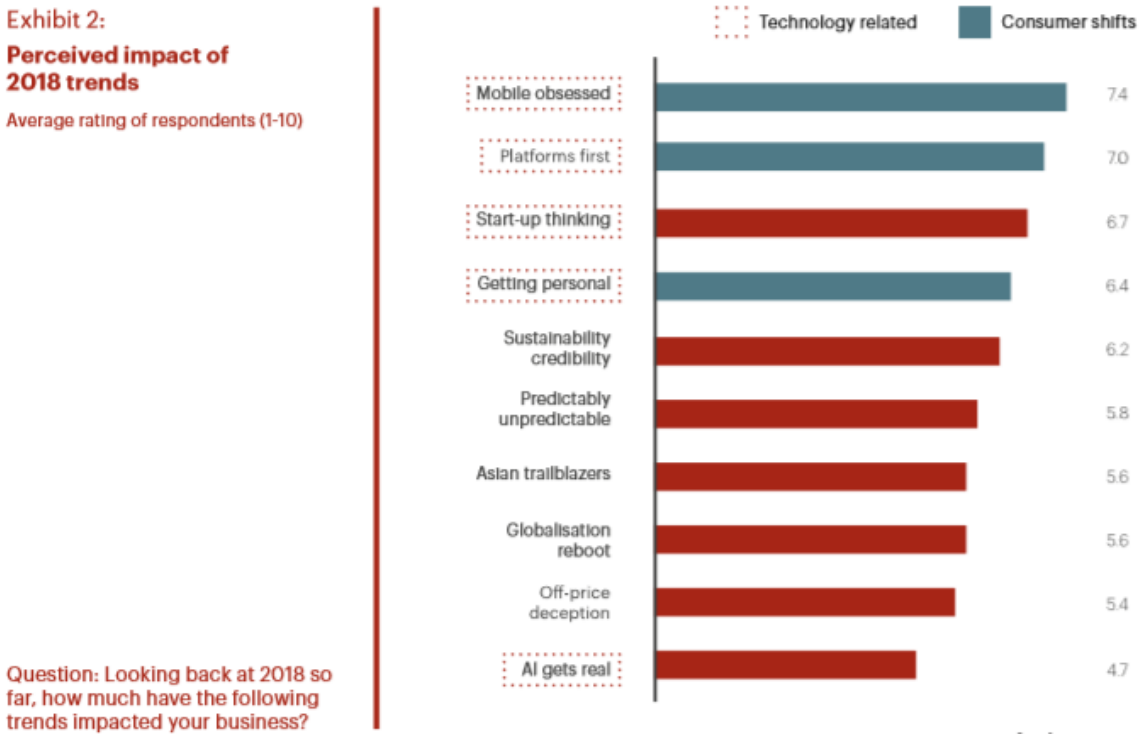

Figure 4: Perceived impact of 2018 trends on executives' businesses. Source: BoF -McKinsey, State of Fashion Survey.

In particular, clothing is one of the biggest sectors in the global economy. It represents almost the 60% of the total textiles used and is expected to grow further. Globally, the clothing industry employs more than 300 million people along the value chain and the production of cotton alone accounts for almost 7% of all employment in some low-income countries.[25] In the last 15 years, clothing production has approximately doubled (figure 5), and this is due most of all to the fast fashion phenomenon. What characterizes fast fashion are the fast-changing trends, which lead to a high number of collections, a big frequency of transports and a growing consumerism, thus shortening the product life cycle and affecting the environment. The secret of the success of companies like Zara is given by an offer of garments that follows high fashion trends but at much more

[25] Ellen MacArthur Foundation, *A new textiles economy: Redesigning Fashion's Future*, 2017, p. 18.

affordable prices. Consequently, these players in the sector produce different types of clothes and accessorises and quickly renew their catalogues.

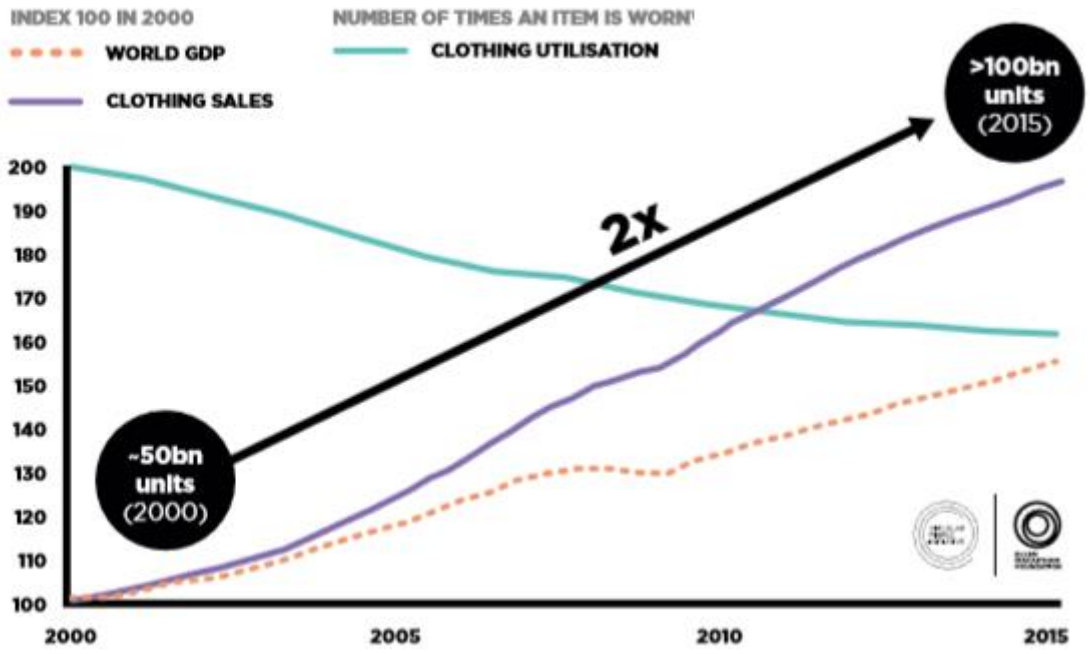

Figure 5: Growth of clothing sales and decrease of clothing utilization. Source: Euromonitor International Apparel & Footwear 2016 Edition in Ellen Macarthur Foundation, "A New Textiles Economy", 2017.

The fashion clothes industry, in addition to being one of the biggest in the World, is also one of the most polluting: it is, precisely, according to the Ellen MacArthur Foundation, the second most polluting sector in the World, after the oil and gas one. The current system of production, distribution and use of clothes, operates mostly linearly. A high amount of non-renewable resources is used to produce clothes that are often little used, whose materials at the end of use are not recycled but burned, causing significant carbon dioxide emissions. Synthetic fibres have the worst effects on the environment: plastic materials derived from oil are not renewable resources, like artificial fibres and viscose. Fabrics of this type, like nylon, elastane and polyester are not biodegradable and, with the washing, they release tiny fragments - the microplastics - that from the washing machine's discharge end up in rivers, lakes and seas, accumulating in the water causing significant environmental damage. According to the IUCN, the International

Union for Conservation of Nature, between 15% and 31% of the microplastics present in the oceans, in fact, derive mainly from washing in the washing machine. Even the apparently preferable natural fibres should not be underestimated. For example, wool production causes important methane fumes. Indeed, greenhouse gases come from livestock, which accounts for about 10% of global emissions. The most used natural fibre is cotton, but it is treated with fertilizers and pesticides too. The substantial problems, environmentally speaking, of this linear model are the underuse of the products, the failure to recycle materials and the enormous waste of resources. It is estimated that more than half of fast fashion products is disposed of in under a year. The "Pulse of the Fashion Industry" report estimated that the overall benefit to the World economy could be about EUR 160 billion in 2030 if the fashion industry would try to address the current environmental problems.[26] The clothing utilization – the average number of times a garment is worn before stopping using it – has decreased globally by 36% compared to 15 years ago. The percentage is calculated to a global level, which means that many low-income countries have a relatively high rate of utilization, while high-income countries, like U.S. and China, have a lower rate of utilization. Less than 1% of materials used to produce clothing is recycled into new garments and, moreover, the clothing industry uses, for the production of garments, around 93 billion cubic meters of water each year, contributing to the problem of water shortages in the poorest regions of the World.[27] The industry has a direct impact on the areas of production, contributing to the pollution of air and water, to the problem of plastic in the oceans and in the rivers, to the diffusion of substances that are toxic for humans and animals and to the violation of safe working conditions. Another phase that contributes to environmental pollution is transport. Today, fashion companies have an increasingly fragmented and distributed supply chain in more than one market worldwide, and this increases the movement of raw materials and semi-finished goods from one country to another, increasing the greenhouse effect. The negative impacts on environment and people are generated at all stages of the supply chain, from the production of the fibres to the disposal of the finished product, but firms can't be considered the only responsible for this problem. The low sustainability of fashion is partly attributable also to consumers. In the past years, only

[26] Global Fashion Agenda and The Boston Consulting Group, Inc., *Pulse of the Fashion Industry*, 2017.
[27] Ellen MacArthur Foundation, *A new textiles economy: Redesigning Fashion's Future*, 2017, p. 20.

the spring/summer and autumn/winter collections existed in one year, while today times have been reduced and, in some cases, new lines are presented even on a weekly basis. Today's consumers no longer buy as needed and renew their wardrobe much more often, following trends and tastes that change quickly.

On current trend, the negative impacts of the fashion industry will be potentially catastrophic. If the sector continues on its current path, by 2050, it could use more than 26% of the carbon budget associated with a 2°C pathway. Moreover, the use of non-renewable resources would reach 300 million tons per year and it is estimated that between 2015 and 2050 the plastic microfibers present in the oceans will reach 22 tons.[28] The same profitability of the sector would be at risk because, according to "The Pulse of the Fashion Industry" report, starting from 2030 the clothing brands could see a decline of their EBIT of over three percentage points, or a profit reduction of about EUR 45 billion.

Thanks to a great sensitization and to an increasing awareness on the topic of sustainability, the situation is changing, even if slowly. Fashion companies are understanding that competing only on pricing and branding is no longer enough, and that to be successful they need to integrate sustainability in their strategy. The entire industry is moving toward a more conscious way of doing business because markets and consumers are asking for it. Even the most famous mass brands have started to commit in producing more responsibly, with a particular attention on environmental issues. For example, Zara, the propeller of the fast fashion, in 2015 has launched "Join life", a collection that includes clothes made with natural fibres and reduced use of water. "Join life" is also a campaign to express Zara's commitment toward environment and society, with the recycle of clothes, destination of profits for humanitarian aids, choice of suppliers following precise standards and a reduced impact on the environment. Before Zara, also H&M had launched a sustainable collection called "Conscious", with the 57% of the materials used coming from recycled fabrics or sustainable sources in 2018.[29]

Three quarters of fashion managers believe that more regulations are needed for sustainability in their sector, with 70 percent saying that a more sustainable approach is

[28] Ellen MacArthur Foundation, *A new textiles economy: Redesigning Fashion's Future*, 2017, p.21.
[29] H&M Group Sustainability Report, 2018.

either “mission-critical” or a key objective for their companies.[30] According to a poll conducted by executive search firm Odgers Berndtson, just 32 percent of senior executives working in the fashion and retail sectors said the main driver for increased sustainability was company ethic, while the 39 percent cited changing consumer demands. Even though the commitment is growing, putting these theories in practise is difficult, most of all due to commercial pression. In fact, managers are convinced about the importance to embrace sustainability, also because it improves company’s reputation in front of its consumer, but growing sales and maintaining competitive prices remains the main objective. In the fashion industry, the challenge for the future is understanding how to integrate sustainability in company’s strategy without putting profitability at risk.

1.2.1 Circular Economy

Circularity has a key role in the application of sustainability, because a careful product design, which considers the resources used throughout the entire life cycle, can lead to greater profits while reducing negative impacts on environment. Circular economy defines an economic system designed to be able to regenerate by itself, thus also guaranteeing its eco-sustainability. In a circular economy the flows of materials are of two types: biological ones, able to be reintegrated into the biosphere (for example food), and technical ones, destined to be revalued without entering the biosphere (for example clothes). In this elaborate only the circular economy involving technical materials will be taken into consideration.

There are several approaches to circular economy, given by literature:

- Kenneth E. Boulding in “The Economics of the Coming Spaceship Earth” (1966) describes two types of economy, the “cowboy economy”, which considers resources as unlimited, and the “spaceship economy”, which considers our

[30] Huw Hughes, *Three quarters of fashion and retail bosses say more sustainability regulations needed*, in “Fashion United”, 2019

planet as a closed system with limited resources and where people must learn to reuse materials;

- Walter R. Stahel and Genevieve Reday in "The potential of substituting manpower for energy" (1976) talk about circular economy for the first time, about the extension of product life, the creation of durable products and the prevention of consumption;
- Michael Braungart and Bill McDonough in "Cradle to cradle: Remaking the way we make things" (2002) coin the term "cradle to cradle", which is an approach to design that plans to adapt industrial processes to nature. All the resources used then, fall into a rework process and become available for other uses, thus creating circularity.

Ellen MacArthur, founder of the Ellen MacArthur Foundation in 2010, has been the first to define circular economy: "a circular economy is an industrial system that is restorative or regenerative by intention and design. It replaces the 'end-of-life' concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models.".[31] Circular economy leads companies and consumers to think and act in a new way, shifting from a linear model, with production and consumption, to a circular model, with production, consumption and recycling.

For the fashion industry, circular economy represents a great opportunity not only to reduce the impact on environment, but also to make the supply chain more efficient and reduce the costs deriving from waste. Today, the production of clothes follows a linear model: produce – use – throw, with a consequent increase of the environmental cost. It is necessary to move from a linear model to a circular one, to reduce waste and reinsert them into the production cycle, giving them new value. Regarding sustainability, the main problems of the sector are the underutilization of clothes and footwear, the immense footprint it is leaving on the planet using non-renewable resources and the catastrophic effects on the global warming. Creating a restorative and regenerative

[31] Ellen MacArthur Foundation, *Towards the circular economy. Economic and business rationale for an accelerated transition*, vol.1, 2013, p.7.

system would provide benefits for businesses, societies and environment, being able to exploit the highest value of products. In fact, circularity would have positive effects on the industry, such as a production of higher-quality and more durable clothes, the possibility to fully capture the value generated by products during but also after their use, the use of renewable energy and resources, the regeneration of natural systems that does not pollute, and the creation of new growth opportunities deriving from efficiency of processes. According to "A new textiles economy: Redesigning Fashion's Future" report by McKinsey & Company and Ellen MacArthur Foundation (2017), a circular approach "could boost Europe's resource productivity by 3 percent by 2030, generating cost savings of €600 billion a year and €1.8 trillion more in other economic benefits". Among the several initiatives to promote circularity, the Ellen MacArthur Foundation has created a movement called "Make Fashion Circular". It was launched in 2018 during the Copenhagen Fashion Summit and brings together leaders from the fashion industry, including Burberry, H&M Group, Stella McCartney, to stimulate collaboration and innovation among companies to follow the principles of the circular economy. The members elaborated a report showing the negative effects of the fashion industry, in particular the textile sector, and proposing a new model of textile economy. According to this initiative, the ambitions for a new textile industry involve (figure 6):

- Phase out substances of concern and microfibre release, aligning industry efforts and coordinating innovation;
- Increase clothing utilization exploiting the power of brands and promoting durability and quality;
- Radically improve recycling, from design to consumption;
- Make effective use of resources and move to renewable inputs, generating less waste and making the process more efficient.

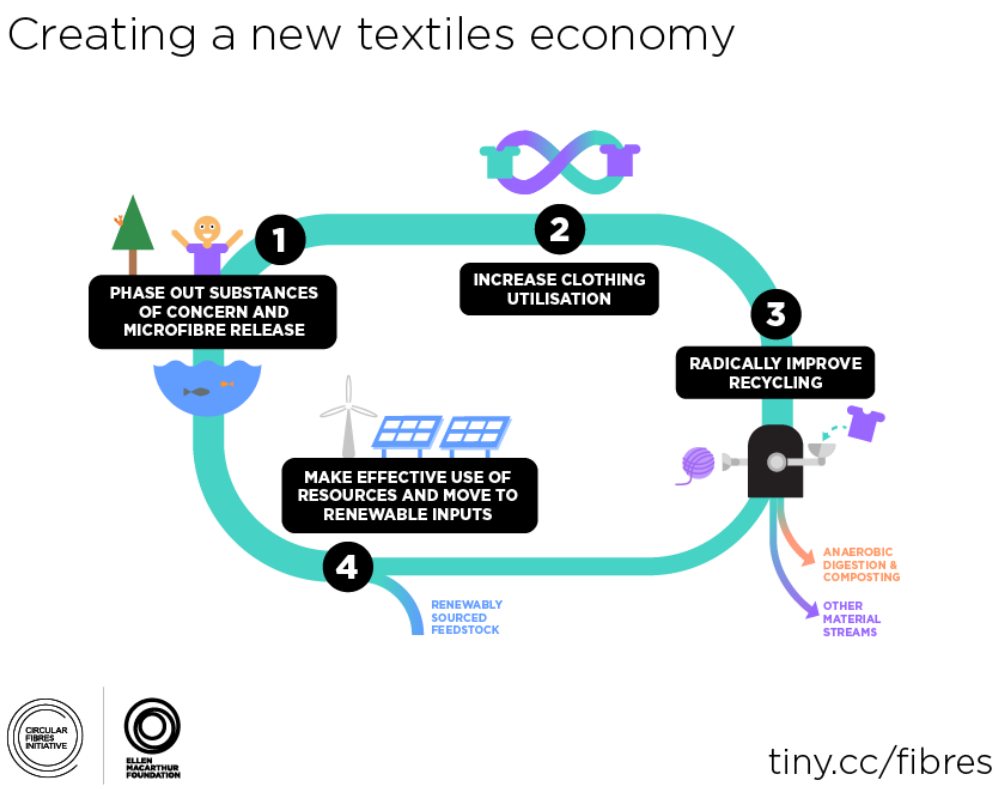

Figure 6: Phases for a new textile economy. Source: Ellen MacArthur Foundation, "A new Textiles Economy".

Another important initiative to promote circular economy is the Circular Economy Action Plan, implemented by the European Union in 2015.[32] The main objective is to help accelerate Europe's transition to a circular economy, boosting global competitiveness, promoting sustainable economic growth and creating new jobs. The Action Plan defines 54 measures to "close the circle" of the life cycle of products: from production and consumption to waste management and the secondary raw materials market. Furthermore, it identifies five priority sectors to accelerate the transition along their value chain (plastics, food waste, essential raw materials, construction and demolition, biomass and biological materials). The plan places a strong emphasis on creating a solid foundation on which investment and innovation can flourish. Of the 54 actions, some are completed and other are being implemented. According to the report

[32] European Commission, https://ec.europa.eu/commission/priorities/jobs-growth-and-investment/towards-circular-economy_en

from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions updated to March 2019, "the EU Monitoring Framework for the Circular Economy shows that the transition has helped put the EU back on a path of job creation. In 2016, sectors relevant to the circular economy employed more than four million workers, a 6% increase compared to 2012", and also "circularity has opened up new business opportunities, given rise to new business models and developed new markets, domestically and outside the EU. In 2016, circular activities such as repair, reuse or recycling generated almost €147 billion in value added while standing for around €17.5 billion worth of investments." [33] With the Action Plan, circularity has been systemically introduced in all the aspects of the value chain, from the production of plastic to its consumption, from a better use of water and food systems to a good management of waste. The Action Plan gave a great contribution also in the achievement of the 2030 Agenda Sustainable Development Goals. All these results were made possible by the cooperation between Member States, citizens, business communities and the European Parliament. Although this initiative has led to a great improvement in the promotion of circular economy, only 9% of World economy can be considered fully coherent with this model, leaving plenty of scope for improvement in this field.[34]

In conclusion, every choice can't be the right one if we consider only a part of the life cycle of a product: to really be sustainable an analysis is needed to determine the impact of every production, distribution, use and disposal phase on the environment, and to coordinate them to eliminate waste and reduce pollution.

1.2.2 The role of consumers: growing attention towards sustainability

Historically, fashion was conceived as a simple satisfaction of needs. Nowadays it reflects the desire of the consumer of expressing himself and being accepted in the

[33] European Commission, https://ec.europa.eu/commission/presscorner/detail/en/IP_19_1480
[34] Circle Economy, *The Circularity Gap Report*, 2019.

society, with a fast-changing demand. In the 1990s, the fashion industry was characterized by outsourcing phenomena in developing countries, high exploitation of resources and workers, and profit as the only objective. During these years, fast fashion established and developed as the prevalent business model thanks to a tendency to consumerism. Nevertheless, the consumer of today is increasingly thinking about the negative social and environmental effects of fast fashion, wondering if the clothing we buy frequently at a low price is not actually a product with a much higher invisible cost. For these reasons, a new consumer profile has begun to emerge: a more critical and conscious consumer, who has the possibility to shift market balances and lead companies towards environmentally and socially compatible choices. For example, in 1991 Nike has been caught up in a scandal regarding low wages and poor working conditions in one of its Indonesian factories. After receiving media attention and a consequent boycott by consumers, Nike was forced to change its supply chain management and today it is one of the most transparent companies in the World, competing not only on profit but also on its reputation. This is an example of how consumers can change the market by changing their needs and their demand for goods. Companies are moving toward a more sustainable behaviour not only because it is the right thing to do, but also because consumers are asking for it, being aware of the importance of being responsible toward society and environment. According to Gfk Eurisko, over one third of clients consider sustainability a decisive factor at least as much as quality and price. In particular, younger consumers are pushing companies towards a more responsible production, with the 90 percent of millennials willing to refuse to buy from an organization that has negative impacts on people and planet.[35] This data are important because, according to "The State of Fashion 2019" report by McKinsey, "Gen Z (born 2000-now) alone will account for 40 percent of global consumers by the end of 2020", increasing their buying power over time. The new consumer is also called "LOHAS", which stands for "Lifestyles of Health and Sustainability": a consumer who adopts a lifestyle based on attention to his own health and that of the planet, who buys carefully and gives attention to the quality of products. He is able to make informed purchases in his everyday life, putting pressure on companies that compete on

[35] Cone, *2017 Cone Communications CSR Study*, 2017.

sustainability and that want to reach a target willing to pay more for goods produced responsibly. As said by Leonardo Becchetti in “Il Voto nel Portafoglio” (2008), the purchase becomes a way to reward companies that concretely integrate sustainability into their strategy, because with responsible choices and a conscious consumerism the consumer can influence companies’ activity and direct them towards a more sustainable production. [36]

In addition to influencing firms, a responsible consumer behaviour also allows to reduce the negative impacts of the fashion industry on the environment. As customers, people can:

- Check labels to identify ethical products to understand where the production takes place and most of all the materials used. If the label doesn’t give enough information, the consumer can collect it on-line or directly asking to the retailer;
- Buy second-hand products, to reduce waste and support circular economy;
- Buy less and buy local, to help reducing the carbon emissions deriving from products that should travel to get from the place of production to the place of sale and to extend the life cycle of fashion goods;
- Choose products ethically made and coming from organic materials, like wool, organic cotton and bamboo, or from recycled materials;
- Wash less, to reduce the emissions of microplastics in the oceans deriving from the laundry of synthetic textiles.

Principles such as trust, reciprocity, solidarity, equity, sustainability, justice, are gaining more attention and importance and it is clear how this is absolutely necessary to be able to affirm a new idea of development based on greater social cohesion, which ensures well-being based not only on economic parameters, but also on the enhancement of culture, knowledge, health, human relations, in a more protected environmental context. In this context, the new consumer can use its purchasing power to influence markets and companies, but he can also concretely make the difference by making

[36] Leonardo Becchetti is an Italian economist and since 2006 he is professor of Political Economy at the Tor Vergata University of Rome. His main research topics concern ethical finance, microcredit, corporate social responsibility and fair trade. He is the author of numerous essays, among which: “Felicità Sostenibile” (2005), “Il Mercato Siamo Noi” (2013), "Wikieconomia. Manifesto dell'economia civile" (2014). Source: https://it.wikipedia.org/wiki/Leonardo_Becchetti

informed and conscious purchases and acting responsibly in the consumption and use of products.

1.2.3 The Fashion Pact

2019 has been a critical year for environment: Amazon forest has burned, Australia has been hit by fires, pollution and global warming are increasing, water is more and more scarce in poor countries and glaciers are melting faster and faster. The resources we have are not unlimited, but we behave as if they would be, without caring about the future. On July 29th we have exhausted the annual budget of resources that Earth can regenerate: from that date until the end of 2019 people have lived in debt, consuming natural capital that was destined for future generations. It has been the earliest date ever, four days before than the one in 2018.[37] The situation gets worse every year, and for this reason one of the main issues raised at the G7 conferences of August 2019 in Biarritz (France) was the environmental problem. The French President Emmanuel Macron, with the Minister of Economy and Finance Bruno Le Maire, the Minister of Labour Muriel Pénicaud and the Deputy Minister of Ecological and Solidarity Transition Brune Poirson, invited to the Elysée the representatives of the 32 fashion and textile leading companies that, at his side, announced the Fashion Pact. The French President entrusted, in the month of April 2019, François-Henri Pinault, President and CEO of Kering, to involve the most important actors in the fashion and textiles industry to achieve goals in the field of reduction of the ecological impact caused by the fashion sector. The companies involved, from fast fashion to sport and luxury brands, are: Adidas, Burberry, Bestseller, Capri Holdings Limited (Versace, Michael Kors, Jimmy Choo), Chanel, Ermenegildo Zegna, Carrefour, Everybody&Everyone, Fashion3, Fung Group, Galeries Lafayette, Gap, Giorgio Armani, H&M Group, Hermes, Inditex, Karl Lagerfeld, Kering, La Redoute, Matchesfashion.com, Moncler, Nike, Nordstrom, Prada Group, Ralph Lauren, Puma, Pvh (Calvin Klein, Tommy Hilfiger), Ruyi, Salvatore

[37] Overshoot Day, https://www.overshootday.org/about/

Ferragamo, Selfridges Group, Stella McCartney, Tapestry. The pact – which is also open to other companies - has three main levels of action:

- Global commitment, to respond to the priorities set by the global community through the UN SDGs, Planetary Boundaries[38] and all the UN Conventions regarding climate change, biodiversity and oceans. In particular, companies commit to stop global warming, creating and implementing an action plan to eliminate greenhouse gas emissions by 2050, in order to keep global warming below 1.5 ° C, between now and 2100; to restore biodiversity, achieving the objectives set by the parameters established by the Science-Based Target initiative, to restore natural ecosystems and protect species; to protect the oceans, reducing the negative impact of the fashion industry on the oceans themselves, through concrete initiatives, such as the gradual reduction of disposable plastic;[39]
- Concrete joint initiatives, which require collaboration between brands and stakeholders of the fashion industry. In particular, they will "promote transparency and accountability", "implement science-based targets on climate", "support the development of SBTs on biodiversity and initiatives that advocate new approaches in farming and agriculture that eliminate the need for intensive, high impact systems", "work to ensure social inclusion, fair wages and respectful working conditions all along our supply chains with a focus on empowering small-hold producers and women in low-income countries";[40]
- Accelerators, including "actions that cut across the commitments and that create the enabling environment to achieve the targets". In particular, they will support circular economy, educate and build awareness, "drive more impact financing through cross-sector collaboration", and "support innovation around key technologies that can underpin commitments and outcomes".[41]

[38] The Planetary Boundaries represent a concept involving terrestrial system processes that contain environmental boundaries, proposed in 2009 by a group of terrestrial systems and environmental scientists. Source: https://www.stockholmresilience.org/research/planetary-boundaries.html
[39] Prada Group, https://www.pradagroup.com/it/sustainability/environment-csr/fashion-pact.html
[40] Fashion Pact, Biarritz, 2019, p.6.
[41] Fashion Pact, Biarritz, 2019, p.7.

These objectives are based on those of the Science-Based Target initiative (SBT1)[42]: the idea is to strengthen collaboration between private companies and national states to face contemporary and future environmental issues. The Fashion Pact is not legally binding but can be considered as a set of guidelines for the CEOs of companies who decide to join. Anyway, this is an unprecedented collaboration, because involves the main multinationals operating the fashion and textile industry, one of the main polluting in the World, and the most influent CEOs in the market.

1.3 Global certifications and standards

For a company, it is necessary to communicate to stakeholders if they operate in a sustainable way, both in environmental and social field. There are standards and certifications that are valid globally and to which companies can conform.

Environmental certifications in the fashion industry guarantee the use of chemicals that are not harmful to the environment, for example both during the cultivation of a plant, such as cotton, and during the spinning of fabrics and in all subsequent processing, up to the finished and commercialized product. Among the most used there are:

- *ISO 14000* environmental standards, which identify a series of norms established by the International Organization for Standardization (ISO). These standards also include ISO 14001, which establishes the requirements of an environmental management system. They will be deepened in the following sections;
- The certificate issued by the *Forest Stewardship Council (FSC*), specific for the forestry sector and for products derived from forests, wood and not, certifies that the raw materials used for the textile comes from forests managed in a responsible manner with total respect for workers, of the inhabitants and the territory;[43]

[42] The Science-Based Target initiative is a collaboration between CDP, World Resources Institute (WRI), the World Wide Fund for Nature (WWF), and the United Nations Global Compact (UN Global Compact) and one of the We Mean Business Coalition commitments that helps companies to determine how much they need to reduce their greenhouse gas emissions to respect targets. Source: https://sciencebasedtargets.org/

[43] Forest Stewardship Council, https://fsc.org/en/page/fsc-labels

- *OEKO-TEX*, a textile certification that offers a wide range of services and labels, depending on the needs of the company. The "Confidence in Textiles" label on each product that follows the Oeko-Tex Standard 100 indicates that the manufacturer is certified as environmentally friendly both in processes and in factories, as well as being tested to verify the absence of harmful substances;[44]
- *Global Recycle standard (GRS),* a certification that is applied not only to products but also to manufacturers that use recycled materials within their creations. The certificate, developed by Textile Exchange, has the task of demonstrating that the materials declared 100% recycled were actually obtained from waste processed through ecological processes;[45]
- *EU Ecolabel,* an ecological label for the European Union, applicable to products realized from processes with a low environmental impact and used to promote circular economy.[46]

Social and ethical certifications, like environmental ones, are fundamental to set minimum standards of respect for workers' rights. The fashion industry, in particular fast fashion and low-cost fashion, has exploited the relocation of companies by moving production to countries where ignoring basic rules is not a problem. The goal is not to hurt people, but to lower production costs and consequently the selling price of retail products. Most social certificates would be useless in European countries like ours, in fact they deal mostly with countries where social problems are very evident: China, Bangladesh, India, South America. Among the most used there are:

- *Social Accountability 8000 (SA8000)*, elaborated by the Council of Economical Priorities Accreditation Agency (CEPAA). It is one of the most important in the field of child labour and rights of workers and will be deepened in the following sections;
- *Fairtrade*, a certification created by a non-profit organization that guarantees fair trade. It works mainly in poor countries, deals with the fashion sector, but also

[44] Oeko-Tex, https://www.oeko-tex.com/en/our-standards/standard-100-by-oeko-tex
[45] Control Union, https://certifications.controlunion.com/en/certification-programs/certification-programs/grs-global-recycle-standard
[46] European Commission, https://ec.europa.eu/environment/ecolabel/

with the food sector, and guarantees the social status of workers in agricultural fields and within production companies;[47]

- Certifications emanated by the *Fair Wear Foundation (FWF)*, for fashion companies that want to guarantee safe and right working conditions of their workers. In particular, they fight for a more ethical textile industry;[48]
- *Worldwide Responsible Apparel Production (WRAP)* certification program, dedicated to promoting safe and ethical manufacturing around the World and focused on the textile and fashion industry.[49]

There are also certifications and standards that cover both the environmental and social aspect of fashion production, among which:

- *Global Organic Textile Standard (GOTS*), which regards the production of organic fibres and controls every step of the value chain, ensuring the absence of chemicals not compliant with the basic requirements on toxicity and biodegradability;[50]
- *Organic Content Standard (OCS*), which identifies and share worthy realities within the textile and clothing industry, guaranteeing the origin of natural fibres from organic farming and their traceability throughout the production process;[51]
- *REACH*, a European regulation made up of 141 articles which includes checks on all chemical substances produced or imported in Europe, in all the steps of the production. It protects human and environmental conditions by spreading knowledge about risks connected with chemicals, giving alternative testing methods to the animal test and improving innovation in the chemical sector in Europe;[52]
- *Bluesign standard,* which derives from an analysis of all the components that influence the production, traces the manufacturing process and evaluates safety at work and environmental health;[53]

[47] Fairtrade, https://www.fairtradecertified.org/why-fair-trade
[48] Fair Wear, https://www.fairwear.org/about-us/get-to-know-fair-wear
[49] Worldwide Responsible Apparel Production, http://www.wrapcompliance.org./en/certification
[50] Global Standard, https://www.global-standard.org/the-standard/general-description.html
[51] Control Union, https://certifications.controlunion.com/en/certification-programs/certification-programs/ocs-100-organic-content-standard
[52] European Chemicals Agency, https://echa.europa.eu/regulations/reach/understanding-reach
[53] Bluesign, https://www.bluesign.com/en/business

- *B Corp certification*, issued to companies by B Lab, an American non-profit organization. To obtain and maintain the certification, companies must achieve a minimum score on a questionnaire analysing their environmental and social performance and integrate their commitment to stakeholders in the statutory documents. It is one of the most used certifications worldwide, because it is globally accepted and applicable to each sector and allows an evaluation of the supply chain from every point of view.[54]

Being able to communicate sustainability to stakeholders has become an essential need for companies, to enhance trust and transparency and to fully exploit the benefits of a responsible behaviour. Conforming to recognised global standards and certifications helps to fight the phenomenon of green washing, illustrated in chapter 1.3.3. In the following sections, the most internationally recognized certifications are examined: ISO 14000 standards and SA 8000 certification standard.

1.3.1 ISO 14000 Standards

The acronym ISO 14000 identifies a series of technical standards relating to the environmental management of organizations, established by the International Standardization Organization (ISO).[55] A key feature of all ISO 14000 requirements is their voluntary nature, which means the absence of any legislative constraint to their use. The decision to apply the ISO 14000 requirements is therefore a strategic decision to be taken by the company management, often linked to the request for compliance by markets. The group of standards of the 14000 series includes general issues, such as environmental management systems, and in addition proposes three types of tools useful for its implementation: Life Cycle Assessment (LCA), discussed in chapter 1.4.2, Environmental Performance Evaluation (EPE), used to evaluate the environmental management system, and Environmental Labelling, by which companies share

[54] B Corporation, https://bcorporation.eu/certification

[55] ISO is an independent, non-governmental international organization with a membership of 164 national standards bodies, which develop International Standards to solve global challenges. Source: https://www.iso.org/about-us.html

information about environmental activities. Norms and guidelines from the series ISO 14000 can be divided by areas of application in:

- ISO 1400x, regarding environmental management;
- ISO 1401x, regarding environmental audit;
- ISO 1402x, regarding environmental labelling of products;
- ISO 1403x, regarding environmental performance;
- ISO 1404x, regarding the evaluation of the life cycle of products;
- ISO 1405x, regarding terms, definitions and words related to environmental management;
- ISO 1406x, regarding various environmental topics, like gas emissions and the greenhouse effect.

These standards include the ISO 14001, which establishes the requirements of an environmental management system and which was published by ISO for the first time in 1996. ISO 14001 can be implemented by any type of organization that intends to achieve an improvement in the performance of its activities through the adoption of an environmental management system. The ISO 14001 standard is a certifiable standard, meaning that certificates of compliance with the requirements contained therein can be obtained from an accredited certification body operating within certain rules. Certification according to ISO 14001 is not mandatory but is the result of the voluntary choice of the company that decides to establish, implement, maintain or improve its own environmental management system. This ISO 14001 certification does not attest to a particular environmental performance, nor does it demonstrate a particularly low environmental impact, but rather demonstrates that the certified organization has an adequate management system to keep the environmental impacts of its activities under control, and systematically seeks improvement in a coherent, effective and above all sustainable way. The ISO 14001 is therefore not a product certification but a process certification.[56]

[56] International Standard Organization, https://www.iso.org/iso-14001-environmental-management.html

1.3.2 SA 8000 International Certification Standard

Published in 1997 by Social Accountability International (SAI), a global non-governmental organization advancing human rights at work[57], SA 8000 is the most globally accepted international certification standard. It is a voluntary framework that responds to the need of organizations to stand out for their commitment to sustainable development, in particular for social issues and for treatment of workers. SA 8000 aims to certify some aspects of business management related to Corporate Social Responsibility, in order to improve working conditions worldwide and to allow to define a standard that can be verified by certification bodies. It covers human right issues including child labour, forced labour, discrimination, health and safety, freedom of association and right to collective bargaining, disciplinary practices, working hours, and remuneration, reflecting labour provisions contained within the Universal Declaration of Human Rights and International Labour Organization (ILO) conventions.[58] It is important because it is the first international standard that measures the ethical level and social responsibility of a company, it is applicable internationally in any industry sector and the compliance with the standard is guaranteed by a third-party independent certification, issued by accredited bodies. Tuscany (Italy) is the first region in the world for certified companies - 16% of the Italian total -, due to the regional promotion of Corporate Social Responsibility among local companies. According to Social Accountability Accreditation Services (SAAS)[59], which publishes every year the World list of companies with SA8000 certification, updated to 2019 the number of such certified companies is 4042, located in 62 countries. The certification lasts three years and is a reliable guarantee for the stakeholders that the company is committed to a social level. The certification process starts with an on-line self-assessment using the Social Fingerprint Self-Assessment and goes on with an evaluation process held by one of the

[57] For further information about SAI: http://www.sa-intl.org/index.cfm?fuseaction=Page.ViewPage&pageId=472

[58] Santos G., Murmura F., Bravi L., *SA 8000 as a Tool for a Sustainable Development Strategy*, in "Corporate Social Responsibility and Environmental Management", Vol. 25, 2018, pp. 95 – 105.

[59] For further information about SAAS: http://www.saasaccreditation.org/organization

independent SAAS-accredited certification bodies. It is followed by on-site monitoring and surveillance audit evaluations to ensure consistency with the certification over time.

1.3.3 The greenwashing phenomenon

Starting in the 1970s, fashion companies began to communicate environmental activities and to promote their ethical behaviour, in order to respond to changing consumer sensitivities and growing concerns about potential risks for the environment and for health triggered by oversized production of human activity. It was very often a matter of fake operations to make the offer more attractive, without correspondence in reality. This is the phenomenon of "greenwashing", which indicates the communication strategy of certain companies, organizations or political institutions aimed at building a deceptively positive self-image in terms of environmental impact, in order to divert public attention from the negative effects on the environment due to their activities or their products. The introduction of the term dates back to the American environmentalist Jay Westerveld, who first used it in 1986 to stigmatize the practice of hotel chains that relied on the environmental impact of washing laundry to invite users to reduce the consumption of towels or to reuse them, when in reality this invitation was mainly based on economic reasons.[60] It can be considered as part of the marketing strategy that can only be exploited where an adequate civic sense of respect for the environment and for minorities has been achieved. These new frontiers, in fact, leverage on a widespread civil sense of an inclusive nature and can influence the purchase only in socially developed contexts. Among the many ways in which you can do greenwashing, moreover, the use of a vague and approximate language or, on the contrary, so slang and technical as to be incomprehensible to non-experts is as common as it is that of suggestive images , with a predominance of shades of green or natural subjects that evoke a certain commitment of the brand or product towards environmental issues. Another way of doing greenwashing is claiming that a product is green and with low environmental impact exclusively on the basis of a very limited set

[60] Jim Motavalli, *A History of Greenwashing: How Dirty Towels Impacted the Green Movement*, in "Aol.", 2011.

of parameters, or simply saying that a company has become more green but without giving any technical information to the consumer, limiting his ability to delve into that statement. If this is possible, it is also because of a certain regulatory vacuum or, at least, of the lack of certain and valid rules at international level. In the world of advertising and Corporate Social Responsibility almost everything is still left to voluntary forms of self-regulation, and the only way to be punished is to be fined for misleading or incorrect advertising by the Federal Trade Commission or by the Antitrust. Marking, labelling, standards and certifications tools often intervene to guide the choice of users and consumers, highlighting the adherence of companies to specific environmental protection regimes. Each of them is a tool put in the hands of the consumer not only to orient themselves in the choice but also to penalize and discourage, through their purchasing preferences, the business practices that derive their profits even from production systems that are not very respectful of the environment. International standards and traceability can represent an effective way of contrasting greenwashing practices, as will be explored in the second chapter.

1.4 Sustainability and fashion companies

The fashion company of tomorrow will be sustainable or will have no way of existing. Consumers and markets are asking for it, and companies are moving toward a more responsible strategy. As said before, a sustainable development implies a long-term vision, creating shared value with all stakeholders in a lasting way over time and analysing all the impacts, economic or not, that the company determines. This implies a new way of understanding value creation: not only profit and shareholder value maximization, but also a contextualized value, with different dimensions. Companies need to include in their strategy an attention toward environment, natural resources, society and people, creating a shared value that contributes to the wellbeing of stakeholders. In this new vision, sustainability is considered as a competitive advantage and not as a cost.

MBS Consulting defined five common characteristics of successful sustainable companies:

1. They have a long-term vision, not only the idea of the immediate return. Maximizing the short-term profit means creating benefits for a few stakeholders, usually the shareholder, at the expense of other important stakeholders like distributors and suppliers, workers, customers and environment. Due to these shortcuts, in the medium and long term, the company could run a series of strategic and operational risks that can undermine its competitive position. Typically, companies with the greatest long-term vision are entrepreneurial and family businesses, because the owners' vision is of a multi-generational and not speculative in nature;
2. They know its stakeholders and their needs, thanks to the use of software and management systems that allow to understand customers' satisfaction, the quality of the relationships with suppliers, internal working conditions and impacts on communities and environment;
3. They quantify stakeholders' satisfaction and consequently set goals to be achieved. These objectives embrace long-term horizons and include parameters that explain the relationship between stakeholder satisfaction and business performance, such as: customer retention, volatility and loyalty of the distributors, level of service of the partners of business and employees of front-end facilities. Finally, where possible, the company try to explain the risk of non-satisfaction in terms of economic impact;
4. They consider stakeholders in company's decision-making process. Every choice must generally manage a trade-off between the maximization of the shareholder (short and often risky vision) and the balance of the impacts towards the plurality of the stakeholders (medium-long vision that guarantees a solid competitive positioning);
5. They create an internal culture where generating value for stakeholders is part of their mission and one of their main objectives. [61]

[61] Ceresi P., *Le cinque fasi vincenti per un'azienda sostenibile,* in "Il Sole 24 Ore", 2017.

Stakeholders are the heart of the strategy of this new concept of sustainable company. In particular, numerous stakeholders operate in the fashion industry, due to the long supply chains and to the great variety of consumers.

So, what can a fashion company do to be sustainable? In 2017 Greenpeace has elaborated a report, "Fashion at the Crossroads", where collects nearly 400 examples of alternatives to the current fashion industry model, which consumes too many resources, and gives some guidelines to fashion companies that wants to be sustainable:

- Improve the design of products, to make them more durable;
- Encourage to reuse, recycle and repair products;
- Use marketing to promote the real value of products and to contrast fast fashion mindset;
- Use sustainably cultivated materials like organic cotton;
- Reduce the use of synthetic materials like polyester;
- Pay attention to the pollution of waters caused by microplastic fibres coming from synthetic materials;
- Implement circularity;
- Have a transparent supply chain and allow its traceability, to control processes and resources;
- Give consumers after-sale services, like the free repair of products[62].

The focus is on the theme of circularity, that could really help to reduce consumption of natural resources in the fashion industry. Fashion companies must pay attention to reduce the flow of materials in the production cycles, otherwise no practice implemented to reduce the environmental impact will make sense. In this regard, a clarification is needed. The fashion industry will never be able to reset its environmental impact, because of its nature: almost every process of the supply chain implies carbon emissions and a totally circular system is a utopia, as said by Federico Rossi in "Marketing e Comunicazione della Sostenibilità. Un Nuovo Vantaggio Competitivo tra Etica e Nuovi

[62] Greenpeace, *Fashion at the Crossroads. A Review of the Initiatives to Slow and Close the Loop in Fashion Industry*, 2017.

Modelli di Business".[63] Nevertheless, companies, supported by governments and people, can act in a responsible way in order to minimize their environmental damage.

1.4.1 Why being a sustainable company: the advantages of sustainability

Adopting a responsible and sustainable behaviour therefore also implies perceiving the advantages in economic terms. The relationship between sustainability and profitability is not simple and refers to a large extent to the ways in which the company relates to all its stakeholders. In fact, the economic advantages do not result from the generic adoption of responsible behaviours but are linked to the dedicated management of specific behaviours in relation with each stakeholder. The advantages for companies are:

- Improved brand perception, of which customers understand economic and non-economic values, that generates trust toward the company and competitive advantage;
- Enhanced competitiveness, because sustainability is one of the main vehicles of innovation, technology, organizational and commercial culture. A sustainable company is therefore exposed to a large number of requests to develop innovative products that respond to the new desires of the end consumers, in particular in the clothing sector;
- Reduced costs of using virgin materials, using instead recycled ones. This would also protect companies from volatility of raw materials' prices;
- Reduced coordination and transition costs, that improve efficiency. In the clothing industry, where production is divided into long chains of independent companies, the production of sustainability-oriented goods requires a reorganization of a transparent production process, strengthening the ties and trust between suppliers and customers and reducing moral hazards;

[63] Rossi F., *Marketing e Comunicazione della Sostenibilità. Un Nuovo Vantaggio Competitivo tra Etica e Nuovi Modelli di Business,* in: Fasan M., Bianchi S., "L'Azienda Sostenibile. Trend, Strumenti e Case Study", 2017, p.86.

- Reduced waste of materials and resources like energy and water, and reduced air pollution thanks to the use of intrinsically less polluting processes, which otherwise would be considered not crucial;
- Incentives from governments. In an era in which environmental protection standards adopted by countries are becoming increasingly stringent, companies that pursue sustainability objectives, and therefore conform to environmental standards, obtain the right to carry out work and sell products that those who do not comply do not get, and can benefit from significant incentives. The most advanced practices in the field of environmental sustainability are also those that most influence choices on future standards, benefiting the pioneers;
- Greater ability to manage risks, allowing to prevent or limit the ones deriving from an irresponsible behaviour, for example work safety;
- Greater ability to attract and retain human capital, and to improve the wellbeing of employees and consequently their performance, spreading a company culture which can generate trust and prevent opportunistic behaviours;
- Greater ability to attract financial resources, because a sustainable company conveys confidence and demonstrate transparency.

Investing in sustainability is no longer just a niche choice linked only to ethical motivations, but also involves concrete financial benefits. Consumer preferences, market needs, shareholder focus and governmental regulations are changing in favour of the sustainability issue, putting pressure on fashion companies in order to benefit from this change.

1.4.2 Measure impacts and document sustainability

To put a sustainable strategy into practice, it is first necessary for a company to be able to assess the impact of its activities on environment and society. Measuring impacts is important to define critical areas and improve their performance, but also to be transparent with stakeholders, giving them the information needed. Some aspects of sustainability are not at all easy to measure, since often some data are not directly

measurable. Therefore, it is important to identify some indicators that produce measurable data to evaluate the level of sustainability of a company. A scientific research by GreenTire magazine in collaboration with the Bocconi University of Milan provides a method to measure impacts through the use of indicators divided into five main areas: level of conformity to rules and standards, quantity of raw materials and resources used and waste and emissions that derive from them, effects produced on environment and on workers, composition of the supply chain and the life cycle of the product, impact of the company on the territory and on the social community. This hierarchy of indicators represents the path of a company towards sustainability: from conformation to global standards to the efficiency of processes and products along the supply chain. Following these indicators, the company can elaborate an analysis of the aspects which can be improved to ensure sustainability in all the three areas: profit, people, planet.

In addition to generic indicators, there are several standardized techniques and methods that a company can use to assess the impacts generated by its activity, among which:

- *Life Cycle Assessment (LCA),* which allows to quantify the potential impacts on the environment and on human health associated with a product, starting from the respective consumption of resources and emissions. It considers the entire life cycle of the system being analysed starting from the acquisition of raw materials up to the management at the end of the life cycle, including the manufacturing, distribution and use phases. It is used as a support in the decision-making process to improve environmental performances. The method is standardized by the ISO 14040-14043 regulations and starts with the definition of the objective and of the functional unit, then goes on with an analysis of resources, raw materials and emissions, evaluating their impacts. In the final phase, data are interpreted and evaluated;[64]
- *Higg Index*, which allows for a self-assessment in the field of social and environmental sustainability along the supply chain. It was launched by the Sustainable Apparel Coalition to be applied to the apparel and footwear industry.

[64] European Environment Agency, *Life Cycle Assessment. A guide to approaches, experiences and information sources*, 1998, p. 9.

It is used to assess the efficiency of processes in terms of sustainability, but also to be transparent with stakeholders. It is composed by the Higg Product Tools, used during the design of a product to estimate its impact once it is realized; the Higg Facility Tools, used to measure the social and environmental performance of their facilities to limit the impacts generated during production; the Higg Brand and Retail Module, used to measure the social and environmental impact of their operations and to share information with distributors and suppliers;[65]

- *Environmental Profit & Loss (EP&L*), an innovative method developed by Kering to measure the environmental impact of its activities, and then shared with other companies to help them constructing a sustainable business. It is useful because measures carbon dioxide emissions, water consumption, water and atmospheric pollution, land use and waste throughout the supply chain, and, at the same time, the costs and benefits of a sustainable management in monetary terms. The method involves a supply chain mapping, the identification of the data to consider and the determination and analysis of the results;[66]
- *B Impact Assessment (BIA),* adopted by more than 50.000 companies and created by B-Lab.[67] The analysis is free and is carried out online by answering a series of multiple-choice questions, different according to the type, size, age and complexity of the company and regarding governance, employees, communities and the environment. The first step consists in assessing the business, the second step in comparing the answers to other companies' ones, and the third step in creating an improvement plan. Based on the results obtained (with scores from 0 to 200), a firm can be classified as an Ordinary Business, with profit as the main objective; a Sustainable Business, with the aim of limiting their impact; or a B Corporation, with environment and society at the same level of profit and a full involvement of stakeholders. The aim is to make sure that the environmental and social performance of companies is measured in the same solid way as the economic results;[68]

[65] Sustainable Apparel Coalition, https://apparelcoalition.org/the-higg-index/
[66] Kering, https://www.kering.com/en/sustainability/environmental-profit-loss/
[67] B-Lab is the non-profit organization based in Pennsylvania which also created and promotes the B Corporation certification. For further information: https://bcorporation.eu/about-b-lab
[68] B Impact Assessment, https://bimpactassessment.net/

- *Carbon Footprint*, used to estimate the greenhouse gas emissions caused by a product, a service, an organization, an event or an individual, generally expressed in tons of CO2 equivalent. The carbon footprint of a product includes the quantification of all greenhouse gas emissions throughout the life cycle of the product, from the extraction of raw materials to the final disposal. At organizational level there are two international standards, one issued by the WRI/WBCSD (GHG Protocol) and the other by the ISO (ISO 14064-1).[69]

The methods illustrated are often used as an assessment of a company's activities and performances in the field of sustainability, with the aim to identify the critical areas and improve them. In order to understand the level of sustainability of a company and share this information with the stakeholders, a firm can produce a sustainability report, also known as Corporate Social Responsibility (CSR) report, to document and communicate social and environmental performance. It redefines the ultimate goals of an organization and focuses on existing relationships between the company and stakeholders, both in a regulatory and instrumental perspective.[70] In this context, the CSR report is a tool of fundamental importance on which companies can rely to communicate with stakeholders and to create good relationships with themselves, which is An important element for the success of the company. The CSR report can be used to evaluate the conformity to standards and rules, to demonstrate the role and the position of the company in achieving sustainability, and to compare performances over time. In Europe, from 2017, it is mandatory for firms qualified as "public interest entities" with more than 500 employees (EU Directive 2014/95/EU), while it is voluntary for the others.

Among the most used models there is the Global Reporting Initiative (GRI) Report, a universally accepted technique for the reporting of economic, social and environmental performance of a company. Of the 250 largest companies in the world, 93 percent publish a CSR report and 82 percent of the latter rely on GRI standards, which over the years have become increasingly complete and detailed.[71] The aim of this report is to

[69] Carbon Footprint, https://www.carbonfootprint.com/
[70] Donaldson T., Peterson Lee E., *The Stakeholder Theory of the Corporation: Concepts, Evidence and Implications,* in "The Academy of Management Review", Vol. 20, 1995, pp. 65 – 91.
[71] Global Reporting, https://www.globalreporting.org/information/about-gri/Pages/default.aspx

standardize and quantify the costs and benefits deriving from social, environmental and governance activities. The European Commission encourages this reporting technique.

According to Marco Fasan in "L'azienda sostenibile. Trend, strumenti e case study" (2017), a new model of reporting is emerging: the Integrated Reporting.[72] It is a synthetic communication that illustrates how strategy, governance, performance and prospects of an organization allow to create value in the short, medium and long term in the context in which it operates. Its main purpose is to demonstrate to stakeholders that an organization is able to create value over time and aims to overcome the limits both of the financial and of the sustainability report. The advantage of the Integrated Reporting is that it helps managers in the decision-making process, allowing to consider both financial and non-financial perspectives, and both short-term and long-term impacts.

The financial report is no longer the only method for communicating business activities to stakeholders: their needs are changing, from economic to social, economic and environmental interests, and the performance of a company is measured mostly in the medium-long term, with sustainable development goals integrated with short-term economic objectives.

1.4.3 Global Reporting Initiative (GRI)

GRI is an independent international organization promoting sustainability reporting since 1997. In 2002 the United Nations Environment Program (UNEP)[73] shared the principles of the GRI by inviting member states of the United Nations to find the headquarters of this body. Amsterdam was chosen and the GRI was formally declared. The organization developed the GRI Sustainability Reporting Standards, in order to help organizations of any size and belonging to any sector and country in the world to

[72] Fasan M., *Lo Stato dell'Arte del Corporate Reporting: the Integrated Reporting*, in Fasan M., Bianchi S., "L'Azienda Sostenibile. Trend, Strumenti e Case Study", 2017, p.21.

[73] UNEP is an international organization that has been operating since 1972 against climate change to protect the environment and the sustainable use of natural resources. Its headquarters are in Nairobi (Kenya), but it operates in different parts of the world through other administrative offices and consists mainly of expert staff who make decisions on environmental policies and activities to be carried out in areas of interest. Source: https://www.unenvironment.org/about-un-environment

communicate and understand their economic and social impact. The standards can be divided into two main types (figure 7):

- Universal Standards (100 series), including GRI 101 (Foundation), GRI 102 (General Disclosures) and GRI 103 (Management Approach). They are applicable to any type of organization and help the company to identify and report the relevant information and to indicate which management methods are adopted;
- Topic-specific Standards, including the series GRI 200 (economic), GRI 300 (environmental) and GRI 400 (social). They are based on the triple bottom line theory, integrating economic, environmental and social sustainability.[74]

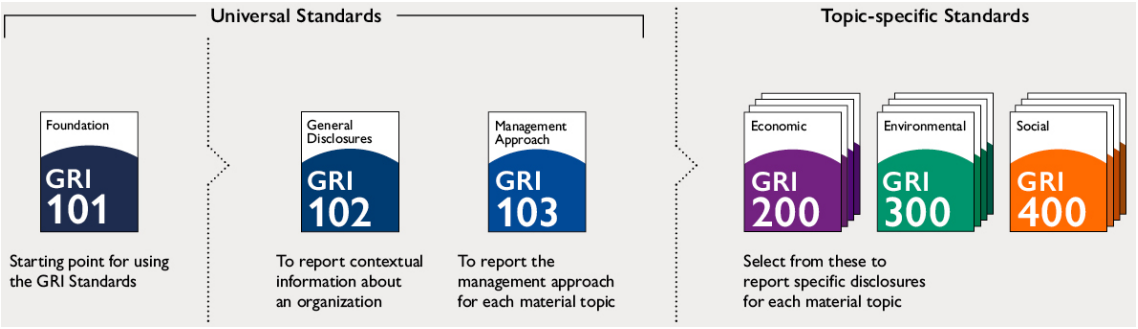

Figure 7: GRI Standards. Source: Global Reporting.

The starting point is the GRI 101 (Foundation): by applying the principles and guidelines of the GRI 101, it is therefore possible to identify the specific aspects that have the most significant impacts - positively and negatively - on the stakeholders. In parallel, the other two universal standards - GRI 102 (General Disclosures) and GRI 103 (Management Approach) - must also be applied. Then it is possible to identify and apply the Topic-specific Standards, choosing them from the 200, 300 and 400 series.

The application of the standards is undoubtedly a best practice, but above all it allows to develop a common language to communicate sustainability.

[74] Global Reporting, https://www.globalreporting.org/standards/gri-standards-download-center/

2. Fashion supply chain traceability and transparency

2.1 Complexity of the supply chain in the fashion industry

During the World Economic Forum 2020 in Davos (Switzerland)[75], one of the main themes discussed by experts was sustainability related to global industries and markets. Among the published reports, the one titled "An Open Platform for Traceability: Accelerating Transparency and Sustainability across Manufacturing Ecosystems" says that the main trends affecting the supply chains in the future are: an increasing complexity of supply chains, a growing consumer demand for transparency, an increasingly shifting supply chains and the criticality of enhancing sustainability.[76]

The social and environmental theme has developed particularly within the fashion sector, especially as a function of the complexity of the supply chain. There are many actors playing a role inside of it, and each of them can change their behaviour to move towards a more responsible supply chain. Today, the fashion industry is far from sustainable, but something is changing thanks to the growing awareness of governments, societies and people who have an influence on the sector. Starting from the suppliers of raw materials and from the brand, aesthetics and ethics must coexist, investments in materials and design innovation must increase and sustainability must be an added value that justifies a higher price. Regarding buyers, there is the need of collaboration making new partnerships among them and with public entities, private

[75] The World Economic Forum is a non-profit foundation based in Cologny, near Geneva (Switzerland). The foundation organizes every winter, at the ski town of Davos in Switzerland, a meeting between leading exponents of international politics and economics with selected intellectuals and journalists, to discuss the most pressing issues that the World is facing, including health and environment. Source: https://www.weforum.org/

[76] World Economic Forum, *An Open Platform for Traceability: Accelerating Transparency and Sustainability across Manufacturing Ecosystems*, 2020.

companies and mass media. Finally, the consumer must be interested in seeking the right information before purchasing, and on the other side the retail must give the right space to sustainable products, educating the consumer through an engaging communication. This set of actors must create a shared value, which balances a conscious demand with a responsible and complete offer, which focuses on sustainability as part of the strategy. To date, every step of the life cycle of a cloth has an environmental impact:

- the textile supply involves the use of pesticides in the production of cotton and other raw materials, the use of large quantities of water and the possible exploitation of animals or people;
- the production phase involves the use of chemicals, the use of large quantities of water and energy and the generation of waste;
- the transport of products implies CO2 emissions;
- the retail uses energy and plastic packaging and generate waste to be disposed of;
- the use of clothes by customers involves the utilization of detergents, water and energy to wash and dry them;
- the disposal of clothes generates waste and pollution.[77]

For example, in the global textile and leather value chains, the 10% of substances used are harmful to human health and the 25% are chemicals, and the 8% of skin diseases are caused by textile and footwear production. Furthermore, it has a water consumption of 79 million m³ per year, CO2 emissions of 1,715 million tons per year, 92 million tons of waste and only 20% recycled.[78] Currently, this is part of the huge damage caused to people and planet by the fashion industry, but there are some practices and actions to do in order to reduce it.

[77] Ellen MacArthur Foundation, *A new textiles economy: Redesigning Fashion's Future*, 2017, pp. 36 – 40.
[78] UNECE, *Transparency and Traceability for Sustainable Value Chains. Accelerating Action for Sustainability in the Garment and Footwear Industry,* 2019.

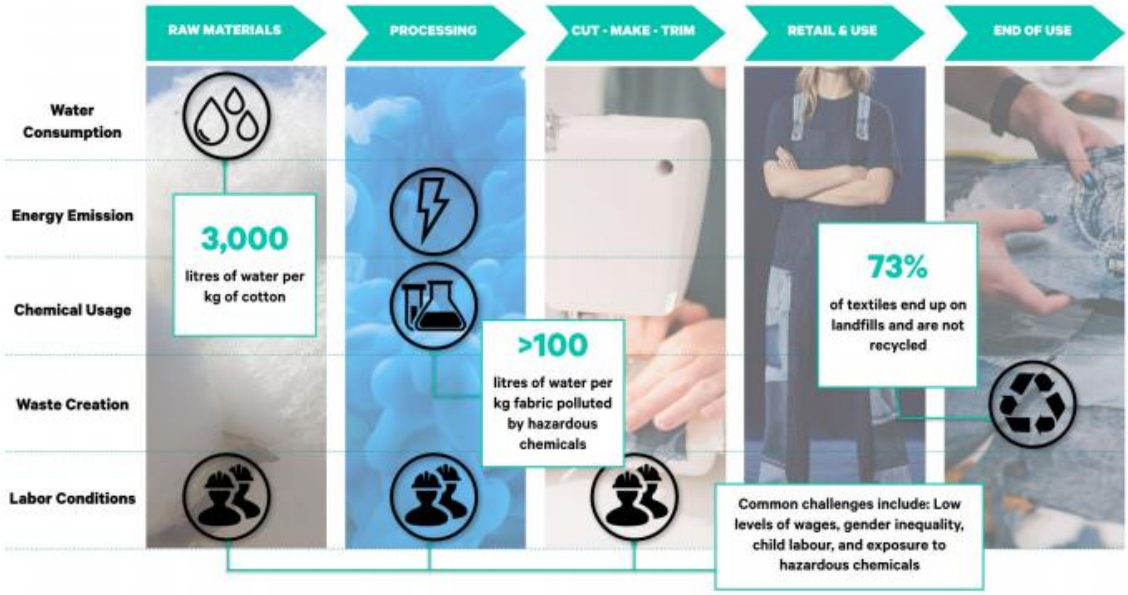

Figure 8: Main impacts of the linear model in the fashion industry. Source: Fashion for Good.

During the textile supply phase, the choice of the raw material is crucial. Every type of garment has an impact on sustainability. On one side, synthetic materials are more resistant and durable and their production needs for less water and energy, but they are non-renewable and not biodegradable. On the other side, natural fibres like cotton can cause problems linked to the use of pesticides, fertilizers and growth stimulants which reduce biodiversity, pollute waters and cause health problems for workers. Nevertheless, a company can choose to use a better fibre: for example, organic cotton instead of conventional one, recycled synthetic fibres instead of original ones, or hemp. During the production phase, there is a huge consumption of energy and water and an intensive use of chemicals, and it often generates waste with problems of disposal. In order to reduce this damage, companies can choose sustainable suppliers, for example with plants with low energy consumption that limits the use of chemicals, or can monitor their current suppliers and encourage them to innovate in favour of sustainability. After the phase of production, products need to be distributed and this generates pollution. The high CO2 emissions are caused by the short production times linked to the fast fashion phenomenon and by the need of a fast delivery for the consumer. A solution could be to reduce road and plane transport and increase the transport by train or ship. In the retail, there are problems of waste deriving from packaging and of a big

consumption of energy, which can be solved by innovating the retail system. The use and disposal phases can cause the most significative consumption of energy and generation of pollution. According to the Ellen Macarthur Foundation, the textile industry is the major contributor to the problem of plastics in the ocean, with almost half a million tonnes of plastic microfibres dispersed in waters during the washing of synthetic fabrics every year.[79] This can be avoided by educating the consumer to a more conscious utilization of clothes, for example reducing the frequency of washing, repairing clothes and buying second-hand products and recycling them through initiatives promoted by companies or non-profit entities.

These best practices in the supply chain can be divided into three main themes: innovation of raw materials and design process, control of the production and recycling. The theory of circular economy encompasses all of them.

2.1.1 From a linear to a circular fashion model: the sustainable supply chain

As said before, the production of clothes and fashion products follows a linear model: produce – use – throw, with a consequent increase of the environmental cost. It is necessary to move from a linear model to a circular one, to reduce waste and reinsert them into the production cycle, giving them new value.

In addition to environmental benefits, the circular economy increases the profitability of companies operating in the fashion industry, making them more competitive and enhancing their reputation. It allows companies to reduce treatment and disposal costs of products and, at the same time, to involve people in the recycling campaigns, increasing trust and transparency of the company. An example is Orange Fiber, an Italian start-up that transforms the waste resulting from Sicilian oranges into textile fibres: from a first raw material to a second one, obtained naturally.[80] Always in Italy, Detox

[79] Ellen MacArthur Foundation, *A new textiles economy: Redesigning Fashion's Future*, 2017, p. 21.
[80] Orange Fiber, http://orangefiber.it/en/

Consortium and Greenpeace have started a project called “The Time is Now”, in collaboration with the European Design Institute, to promote circular economy in textile industry and training of future designers, raising awareness over sustainability. Six students of Fashion Design and Fashion Stylist courses were selected to create five eco-friendly men's fashion capsule collections which have been presented at Pitti Immagine Uomo in June 2019. In fact, circular production starts from product design, through which an idea becomes the development of the product. Sustainability is a direct consequence of how clothes are designed, starting from the choice of raw materials, through the assembly of the various components and ending with the re-use. If a product is not designed from the beginning with the aim of being durable, reused and recycled, it becomes difficult to move towards a circular production. There are two different strategies to follow, based on different objectives:

- *slowing resource loops strategy,* with the aim to lengthen the life cycle of the product by slowing down the use of resources through the design of long-lasting products. Two factors must be considered in the design phase: the quality of the materials used (the physical durability) and the aesthetics of the product (designed to be appreciated for a long time). Furthermore, it is necessary to lengthen the use of clothes by creating services to extend its life, such as re-use of the product itself, maintenance, repair, technical improvement and a combination of these;
- *closing resource loops strategy,* which closes the loop between post-use and production, reaching circularity.[81]

Together with the design process, also the choice of the materials and the assembling is important when talking about circular economy. To reduce the environmental impact, using eco-sustainable fabrics is the best alternative, perhaps using waste from other products. Producing clothes with new raw materials causes, even if reduced, a bigger damage for the environment or for people, instead of using recycled ones. The cultivation of cotton constitutes about 80% of the global production of natural fibres and implies the use of synthetic chemical pesticides, fertilizers, growth stimulants and

[81] Bocken, de Pauw, van der Grinten, Bakker, *Product Design and Business Model Strategies for a Circular Economy*, in “Journal of Industrial and Production Engineering”, 2016, pp. 308 – 320.

defoliants, which cause biodiversity loss and pollution of water and soil. Producing 1 kg of cotton – the equivalent of a pair of jeans – requires up to 20000 litres of water and the production often includes unsafe working conditions and low wages in developing countries.[82] Using recycled materials and extend the product life cycle can help to avoid the production of cotton. Thanks to innovation, now companies are able to create clothes from plastics polluting the oceans, from organic waste or from other clothes. Regarding the production phase, remanufacturing or practices where waste of one company can become inputs for another one should be encouraged. Cooperation among entities to reduce waste and recycle materials can create new opportunities to learn and can boost innovation, reducing at the same time environmental damages. If cooperation is not possible, companies should control their production in order to reduce the use of non-recyclable packaging.

On the other side, at the end of the production and distribution process, there is the customer, which buys and consumes, and which can make the difference too. Companies and governments are educating consumers to recycle and consume recycled products, both in what they eat and in what they wear. For this reason, many retailers are giving consumers discounts and incentives to give back used clothes to allow the company to recycle them into new materials or products. Another solution is the clothing repair: people can choose to lengthen the life cycle of products and take advantage of the free repair service that some brands give after the purchase. Many companies have applied the logic of the collaborative economy to fashion, initiating the phenomenon called Collaborative Fashion Consumption (CFC). The CFC promotes a model for the use of fashion in which consumers, instead of buying fashion products, have access to existing ones through donations, exchanges, purchase of second-hand clothing or through sharing, borrowing or renting.[83] The increase of companies and start-ups dedicated to the offer of rent and sale of second-hand products means that fashion is going from product to service.

[82] Rinaldi Romana F., Testa S., *L'impresa moda responsabile*, Milano, EGEA, 2013, p. 59.
[83] Iran S., Schrader U., *Collaborative Fashion Consumption and Its Environmental Effects*, in "Journal of Fashion Marketing and Management: An International Journal", vol. 21, 2017, pp. 468-482.

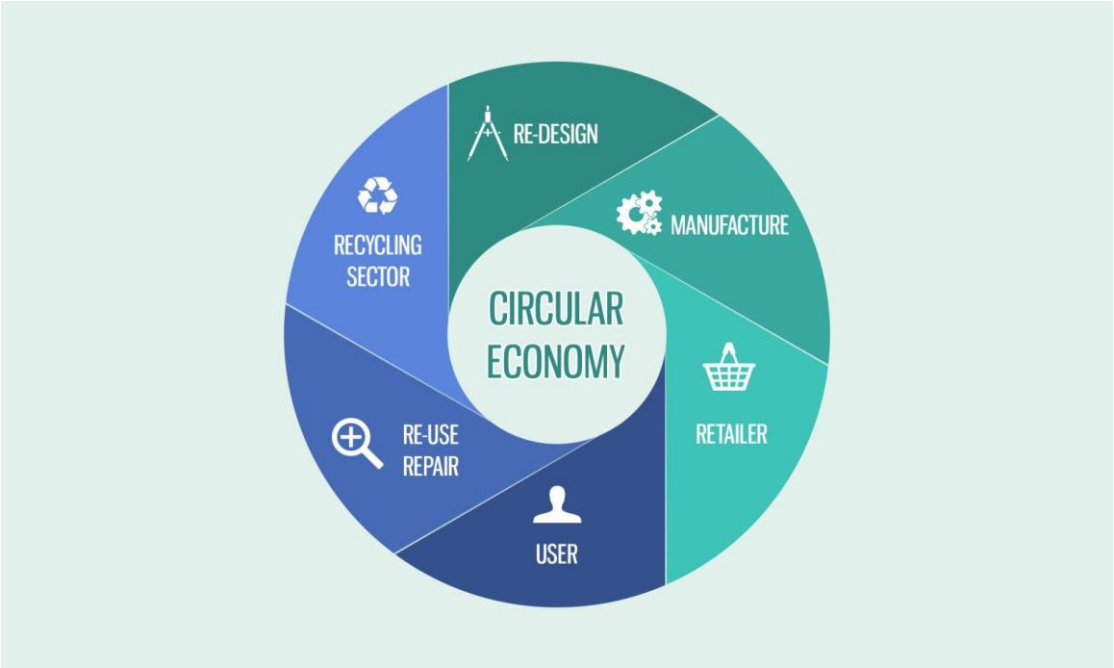

Figure 9: Circular economy model. Source: Ellen Macarthur Foundation.

The circular economy model represents the future of the fashion industry. Starting from design and production conceived as long lasting and non-polluting, up to consumer education for reuse and recycling. This would allow to maximize the life cycle of a product, capturing new economic opportunities and reducing the environmental damaged generated by this sector. "At a global level, we estimate the reselling market to be around 25 billion euros", said Antonio Achille, senior partner and global head of luxury at Mckinsey, during an interview to MF Fashion.[84] Fashion is a sector highly influenced by consumers and stakeholders, and for this reason companies can no longer afford not to be transparent. Traceability is a means that allows companies to communicate their sustainability, give consumers a reason to trust them and collaborate with stakeholders. Being transparent obliges the company to be responsible. As will be explained in the next chapters, traceability is both a means of communication and a tool to control supply chains, from the resources used to the phases of production. It allows to start lean management processes and to identify and optimize waste, making processes more efficient. Traceability involves every aspect of sustainability: social, environmental and economic.

[84] Ferraro M., *Circular Economy Revolution,* in "MF Fashion", 2019.

2.2. Traceability for sustainability: the importance of being transparent in the fashion industry

As a consequence of the Sustainable Development Goals (SDGs) set by the UN 2030 Agenda, companies are working more and more to comply with these goals and be sustainable, and traceability is a means of achieving this scope. In particular, the SDG 12 – Responsible consumption and production – includes the target 12.8, which aims to "ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature".[85] A critical point of fashion supply chains is that they are complex and fragmented, and this makes it extremely difficult for brands and manufacturers to know the history of their products, identify exactly where the risks are located and respond to the growing demand from consumers and civil society for responsible production practices in the fashion sector. The UN Global Compact[86] defines traceability as the "ability to identify and trace the history, distribution, location and application of products, components and materials, to ensure the reliability of declarations of sustainability in the areas of human rights, work (including health and safety), environment and anti-corruption".[87] This requires the active collaboration of actors belonging to the same production network. Traceability needs to become a priority in the fashion industry, in order to allow companies to manage their supply chains in a sustainable and efficient way at the same time. It must be used as a support to the implementation of a sustainable strategy. The next step is making information about supply chain available for the stakeholders, in order to be transparent towards the actors involved. Supply chain transparency means knowing every step of the production process and communicating this information both internally and externally.[88]

[85] Sustainable Development Goals knowledge platform, https://sustainabledevelopment.un.org/sdg12
[86] The UN Global Compact is a United Nations initiative created to encourage companies all over the world to adopt sustainable policies and to respect corporate social responsibility and to make public the results of the actions taken. Source: https://www.unglobalcompact.org/what-is-gc
[87] United Nations Global Compact, BSR, *A Guide to Traceability: A Practical Approach to Advance Sustainability in Global Supply Chain*, 2014, p. 6.
[88] Bateman A., Bonanni L., *What Supply Chain Transparency Really Means*, in "Harvard Business Publishing", 2019.

Traceability was first heard in the 1930s, when some European countries wanted to prove the origin of some high-quality food products.[89] Over the years and up to now, traceability has taken on an essential role in the food sector. Regarding the fashion industry, the theme of traceability acquires a central role in 2013 with the scandal linked to the collapse of the Rana Plaza in Bangladesh. It is considered the most serious fatal accident in a textile factory in history. The day before the tragedy, some cracks on the building were noticed, so the shops and the bank on the lower floors were closed, while the warning to avoid using the building was ignored by the owners of the textile factories. Workers were ordered to return the next day, the day the building collapsed. This scandal has particularly sensitized public opinion on the issue of labour exploitation, increasing the need for customers to know better the history of the fashion products they purchase. The need for transparency comes from stakeholders and finds its origins in the global fragmentation of supply chains, but it is useful for companies in order to be aware of their impact. Tracking a fashion product means knowing its history, from the choice of raw materials, to the production process, to the suppliers involved. It stems from the awareness that the production processes involve a series of externalities that can significantly affect the health of people, the environment, individual safety and the exploitation of natural resources. The need for traceability in the fashion industry follows the stakeholder theory elaborated by Edward Freeman in its book "Strategic Management: A Stakeholder Approach" (1984), which defines the stakeholders as subjects without whose support the company is unable to survive. The theory, applied in organizational management, argues that a company should create value not only for the shareholders, but for all the stakeholders. According to Freeman, "great companies endure because they manage to get stakeholder interests aligned in the same direction". In this sense, traceability is a means of meeting the stakeholders' need for transparency.

Traceability related to sustainability finds its application not only as a means of external communication to stakeholders, but also as a control and efficiency tool for internal processes. In the first case, the objective is being transparent in order to build consumer trust in the brand, giving him the opportunity to make an informed purchase choice.

[89] United Nations Global Compact, BSR, "A Guide to Traceability: A Practical Approach to Advance Sustainability in Global Supply Chains", 2014, pp. 6 – 7.

Reducing information asymmetries between firm and stakeholder, supply chain traceability empowers the second one, making the company responsible for its activities and forcing it to be sustainable. In this sense, traceability has the function to help stakeholders to recognize greenwashing cases, avoiding vague and generic information and preferring transparent companies that guide them towards a sustainable choice. Traceability is aimed for the purpose of managing a flow of data: it is a system for collecting, organizing and processing information based on their communication. In a sector like fashion, closely linked to consumer, it is necessary also to increase revenue by building trust in the brand and generating fidelity, which encourages the consumer to buy a product because it is linked to the responsible behaviour of the company. In the second case, traceability will be able to guarantee progress towards the circular economy and promote responsible strategies in line with the sustainable development goals of the United Nations 2030 Agenda, especially the SDG 12: "Responsible consumption and production". In this sense, at the same time it will allow companies to efficiently manage the use of resources in the production process generating a reduction in costs. These different areas of application of traceability therefore allow to cover different areas in the field of sustainability: from communication to stakeholders to the efficiency of resources. The practical application of traceability measures can generate both benefits and risks, as explained in the following section.

2.2.1 Traceability models

According to literature, there are three main traceability models related to sustainability: product segregation, mass balance and book and claim.[90] They offer different approaches to track an asset along the value chain, depending on the extent to which non-certified and certified materials are mixed together. The most suited traceability model is *product segregation*, which requires that certified components or materials are physically separated from non-certified ones at each stage of the value

[90] United Nations Global Compact, BSR, "A Guide to Traceability: A Practical Approach to Advance Sustainability in Global Supply Chains", 2014, pp. 10 – 15.

chain. This allows consumers to purchase products coming from 100% certified raw materials and allows companies to mitigate the reputational risks. There are two product segregation models:

- *bulk commodity*, which allows to mix certified materials coming from different suppliers in order to reach larger scales;
- *identity preservation*, which does not allow to mix certified materials coming from different suppliers in order to preserve the identity of each product from the first producer to the final consumer. It has been criticised for being costs and resources intensive, and because it requires advanced technologies to collect, verify and control data at each stage of the value chain.

On the other side, the *mass balance* model allows certified and non-certified raw materials and products to be mixed together along the value chain. However, the volume of certified materials must be controlled and monitored from its first utilization to its commercialization, referred to its aggregated amount. At the end of the value chain, the consumer may not be able to identify the percentage of certified components of a product: for example, a company can say that 60% of their clothes are made with organic cotton, but without giving a precise definition of which the certified raw materials are. Finally, in the *book and claim* model, traceability is not implemented in each stage of the value chain, but a company can support sustainable sourcing for example controlling its emissions or using renewable energy. It is not sure that its products contain certified raw materials, but there is the possibility that they flow throughout the supply chain. Using this model, companies try to overcome the complexities of implementing traceability in fragmented global value chains by buying some sustainability certificates from trading platforms in order to claim that they are sustainable.

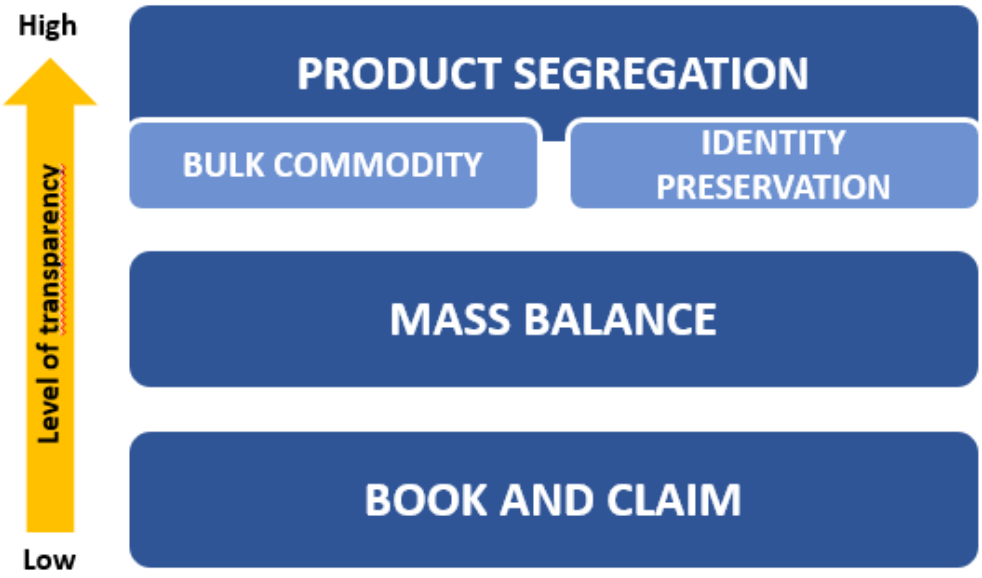

Figure 10: Traceability models and level of transparency associated with them. Source: personal elaboration.

The product segregation model allows for a higher transparency towards stakeholders, because products are monitored at every step of the value chain and because it ensures to consumers the purchase of products made of 100% certified materials. If a company wants to share with its stakeholders the list of suppliers or a map with the production sites, this model is best suited for transparency purposes. These models have been mostly applied by literature to the food industry, due to the fact that the traceability theme has been developed especially in this sector, but they can also be adapted to the fashion industry. For example, the Better Cotton Initiative (BCI)[91], the largest cotton sustainability program in the World[92], is both an example of an existing product segregation model (until the bale of cotton is formed) and of an existing mass balance model (once the bale of cotton is split into yarn). A practical example of product segregation is Patagonia's Traceable Down Standard, a traceability system used for the down of their jackets which will be presented in section 2.5.2.

[91] The Better Cotton Initiative (BCI) is a global non-profit organization with the largest cotton sustainability programme in the World. BCI exists to make global cotton production better for the people who produce it, better for the environment it grows in and better for the sector's future. Source: https://bettercotton.org/about-bci/

[92] Better Cotton, https://bettercotton.org/about-better-cotton/

2.2.2 Advantages and challenges related to traceability

During the Due Diligence Forum, which took place in Paris in February 2019, the United Nations Economic Commission for Europe (UNECE)[93] presented an analysis on the implementation of traceability measures in the fashion industry. The UNECE emphasized the need to have a more transparent supply chain in order to achieve the Sustainable Development Goals also in the fashion sector. What emerged from that analysis is that on over 100 countries from all around the World only 34% of companies integrate traceability in their strategies. According to the UNECE, the advantages that fashion companies can derive from traceability of their supply chains are:

- Efficient management of the supply chain, reducing costs and environmental damage deriving from the production process and identifying opportunities for improvement;
- Efficient management of resources, with more control and information on the use of energy, water and raw materials, allowing to reduce the consumption of these, to manage the risks for human health deriving from the use of chemicals and to grant labour rights.

A new standard of traceability of the supply chain would guarantee progress towards the circular economy and promote responsible consumption choices in line with the sustainable development goals of the United Nations Agenda for 2030. The advantages can be seen both as economic, social and environmental because traceability is a pre-condition to sustainability. From an economic point of view, it allows to understand which the processes with the biggest consumption of resources are and which generate the biggest quantity of waste, in order to take actions to reduce them and save money. From a social point of view, traceability allows to understand if there are external or internal processes which don't ensure the respect of human rights or involve the use of chemicals harmful for human health. From an environmental point of view, traceability

[93] The United Nations Economic Commission for Europe (UNECE) is one of the five economic commissions reporting to the United Nations Economic and Social Council (ECOSOC). The main function of the commission is to evaluate the economic, technical and environmental problems, both in the member countries and among them, and to suggest possible solutions. Source: https://www.unece.org/mission.html

allows to identify areas with the biggest consumption of energy and with the biggest production of non-recycled waste, and to understand the level of pollution linked with their production process. Most of these problems can be solved with a more innovative selection of raw materials, with a product design aimed at recycling and with a more responsible production process that involves measures to reduce the environmental damage generated.

The following step is transparency, which is obtained through the sharing of information deriving from supply chain traceability with stakeholders. Always according to the UNECE, the advantages that fashion companies can derive from transparency of the supply chain are:

- Reputation risk management, giving accurate information about the implementation of sustainability in their strategy and about Corporate Social Responsibility. This allows companies to cope with pressure from countries, governments and society for a more responsible production and to comply with increasingly stringent regulations;
- Enhanced communication with business partners, exchanging and sharing information with stakeholders, which allows to build strong relationships with suppliers and clients;
- Consumers' trust, allowing them to collect information about the safety of products and to satisfy their need for a conscious purchase.[94]

On one side, a transparent company is trustworthy in the eyes of contractors and clients, which allows to extend the network of business partners and to have long-term contracts. On the other side, transparency can improve company's reputation for the society and for consumers, especially if the firm has a sustainable strategy to communicate. As said in the first chapter, the attention of consumers towards sustainability problems has grown during the last 30 years, and this has had an important influence on the fashion industry. According to the Marketing Management

[94] UNECE, *Accelerating Action for a Sustainable and Circular Garment and Footwear Industry: Which Role for Transparency and Traceability of Value Chains?*, 2020, pp. 13 – 14.

Journal[95], consumers' intention to buy sustainable products does not correspond to their real actions, and this is mostly due to the lack of information. In particular, in the fashion industry recycled or eco-friendly products have a higher cost than other products, due to the fact that they require more complex production processes and specific raw materials. If the consumer doesn't know the detailed reasons behind this high price, they will not be inclined to make that purchase choice, being unable to justify the difference in price. In this context, traceability serves as a mean of collection of data about the life cycle of a product, from the choice of materials to the resources used during the production phase. Tracking its path means being able to communicate it and being transparent towards the final consumer, telling the social and environmental value of that product. This would allow to reflect the true cost of a sustainable product and to associate responsible values with the brand. Traceability intended in a sustainable context is also a means to protect companies and consumers from the greenwashing phenomenon, presented in the first chapter. The control of the supply chain is the main tool to grant quality and transparency, and to differentiate from companies that give vague information in order to exploit the economic advantages linked to a false commitment to sustainability. Supply chain transparency related to sustainability can manifest through a CSR report or a code of ethics, and through certifications or international standards application. According to a survey conducted by UNECE, the key information to be shared through traceability of sustainable supply chains in the fashion industry should include the country of origin of the main components of products, the features of raw materials used, data about the process of production and compliance with sustainability standards and certifications.[96]

Despite the many benefits associated with it, supply chain traceability is a demanding challenge, due to the organizational complexities of the sector that make it difficult to collect information. Fashion supply chains were not designed to be transparent, due to the risk of losing the competitive advantage in the market. The main challenges linked to supply chain traceability are related to:

[95] Shen D., Richards J., Liu F., *Consumers' Awareness of Sustainable Fashion*, in "Marketing Management Journal", 2013, pp. 134 – 147.
[96] UNECE, UN/CEFACT, *Briefing Note – Sustainable Textile Value Chains in the Garment and Footwear Domain for SDG12*, 2019, p. 9.

- Fragmentation and complexity of the network, which makes it difficult to collect detailed information about processes, especially upstream of the value chain. This problem can be overcome using technological innovations, which will be discussed in the next paragraph;
- Data security, which can be undermined by an excessive transparency. The risk is that competitors use shared information to their advantage, especially for highly specialized and exclusive products, but also to expose the company to criticisms;
- The costs that derive from technologies and resources necessary to manage data and information about the value chain. Traceability requires investments in human and technological resources in order to control and verify products and processes;
- Technological barriers, due to the fact that technological innovations have a high cost, especially for small and medium-sized enterprises. One solution would be to cooperate geographically or by sector to share costs.[97]

The decision to implement value chain traceability or not must be weighed on the basis of the company's possibilities and the cost-benefit ratio that it brings, since beyond the environmental and social gain there must always be an economic gain.

2.3 How to implement traceability in fashion supply chains

According to the United Nations Global Compact, there are seven steps recommended in order to put traceability into practice:

1. Identify key commodities, with as key commodities intended such products whose process of production has the highest risk of having a negative impact on people and the environment. The difficult part of this step is to map the raw materials and the suppliers from which they come from, in order to understand

[97] UNECE, *Accelerating Action for a Sustainable and Circular Garment and Footwear Industry: Which Role for Transparency and Traceability of Value Chains?*, 2020, pp. 15 – 17.

which are the less sustainable. The best solution is to build relationships with first tier suppliers and to have direct interactions with NGO partners;

2. Understand if traceability can be the solution for the sustainability risks linked to key commodities. The guide suggests collecting external information about these products through relationships with trusted suppliers and getting stakeholder inputs. This is important because not every problem regarding sustainability can be solved using traceability. If there are sustainability risks related to key commodities that can be mitigated with traceability, identify and focus on them;
3. Develop the business case for traceability. Once it has been ascertained that traceability can help mitigate sustainability risks, it is necessary to understand which resources are needed and whether they are already present in the company or not. It is necessary to observe competitors in order to prepare the project;
4. Take traceability actions. If there is an existing traceability system, get involved; while if an existing scheme for that commodities is missing, consult stakeholders or institutions in order to find a new one. Partnerships and multi-stakeholder engagement often bring to a solution, overcoming the lack of a common standard;
5. Develop internal practises and processes to support traceability implementation, being sure that it is applied in all the key stages;
6. Engage with suppliers, by communicating the benefits and being sure that they will meet the requirements, educating them to traceability but also listening to their opinion regularly. This will help to boost collaboration and continuous innovation;
7. Stay the course. Traceability implementation takes time, as benefits will be visible in the long term, and needs to be monitored.[98]

In general, collaboration along the value chain is the best practise in order to implement traceability: there is the need of a multi-stakeholder approach in order to be successful. Despite a company's efforts to implement or improve traceability of its supply chain, it

[98] United Nations Global Compact, BSR, *A Guide to Traceability: A Practical Approach to Advance Sustainability in Global Supply Chains,* 2014, pp. 24 – 26.

could be difficult to put them into practice. A common and clear path is missing: there are different technologies, fragmented players, too many possible choices and no common standard. This often leads to a partial traceability of the supply chain or to a confused sharing of data with the stakeholders. To fill this gap, the United Nations Economic Commission for Europe (UNECE), in collaboration with the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT), has developed a preparatory study concerning the textile and footwear sector aimed at providing the tools for a traceable and transparent value chain. The project for an international framework initiative is called "TEXTILE4SDG12", referred to the Sustainable Development Goal 12 of the Agenda 2030 (Sustainable consumption and production), and will be developed between 2019 and 2022. The aim is to help the fashion industry to make informed decisions on the environmental and social risks of production and consumption and to operate according to international standards, increasing transparency towards end consumers. The final output will include the development and implementation of UN standards and guidelines, valid for the entire life cycle of products and for the traceability of sustainable supply chains in the sector.[99] The UNECE's project marks a clear path towards a more sustainable future in the fashion sector: a new standard of traceability and transparency of the supply chain will guarantee progress towards the circular economy and promote responsible consumer choices in line with the sustainable development objectives of the United Nations 2030 Agenda.

Pending a common European standard, there are several traceability systems supported by technological innovations that can be used.

2.3.1 Traceability systems

[99] UNECE, UN/CEFACT, *Textile4SDG12 - Transparency in textile value chains in relation to the environmental, social and human health impacts of parts, components and production processes*, 2017, pp. 14 – 15.

Despite the lack of a common standard, there are already some initiatives, certifications, platforms and start-ups to rely on to start implementing supply chain traceability in the fashion industry.

The Global Organic Textile (GOT) Standard, seen in the first chapter, can be considered a form of traceability globally recognised, because it controls every step of the value chain, ensuring the absence of chemicals not compliant with the basic requirements on toxicity and biodegradability and regarding both social and environmental sustainability. It is not a general and common standard because regards specifically the production of organic fibres, but it is globally recognised in its very restricted application. In 2019 the GOT Standard has been ranked first in the "Traceability of Clothing with Textile Seals" test conducted by Stiftung Warentest, a German consumer product testing organization, for offering transparency and traceability while complying with social and environmental criteria in each stage of the production process.[100]

In order to complement the UNECE's work to establish a global traceability standard for sustainable supply chains in the clothing and footwear sector, the International Trade Center (ITC), an agency supporting small and medium-sized enterprises[101], is working on the development of an online platform for mapping sustainability: the Sustainability Map. It is a freely accessible database that maps sustainability standards and allows companies to understand where their code of conduct is located, opening up supply opportunities and creating a level playing field with regard to social and environmental criteria. The main function of the map is to enable users, and therefore the stakeholders, to understand the sustainability landscape and connect with partners, regardless their position along the value chain. It ensures neutrality, trust and transparency in the value chain traceability and is suitable for small and medium-sized enterprises. Users can register on the website[102] and connect with buyers and other companies globally, then a QR code containing information about the value chain is generated and the user can decide if sharing it with clients or not.

[100] Global Standard, https://global-standard.org/information-centre/news/330-press-release-gots-acclaimed-test-winner-by-stiftung-warentest.html
[101] For further information: http://www.intracen.org/itc/about/
[102] Sustainability Map, https://www.sustainabilitymap.org/home

A Sweden-based start-up for traceability in the fashion sector is TrusTrace[103], which provides traceability, sustainability and circularity tools to engage with consumers. The system maps supply chains using verified data coming from suppliers and offers an advisory service to analyse risks, understand the areas of improvement and communicate sustainability to consumers. They use a blockchain-based technology to visualize the product journey.

Another digital platform for traceability is Provenance[104], which offers an online service for businesses that want to gather data about their supply chains and prove their impact on sustainability. Users can choose to use blockchain technology or to link physical products with digital information, both through an app designed by Provenance. This service allows companies to know and monitor their activities along the supply chain and also to share them with the final consumer using technological innovations.

In the following section the main technologies used to implement traceability in the fashion industry are analysed, in order to underline the importance of developing innovations that benefits companies but also sustainability.

2.3.2 Technological innovations for traceability

Given this tendency towards traceability and transparency of the value chain, three key dynamics are developing in the fashion industry, according to the State of Fashion 2019:

- Companies audit their activities and processes in order to identify areas that can be at reputational risk and that could make stakeholders' trust in the brand decrease. This also allows to highlight and promote their best practises;
- Companies integrate their financial statements with a sustainability report to communicate their impact on people and planet or use international methods for evaluating social and environmental performances. There are standards like the EU Eco-Label, the Global Organic Textiles Standard (GOTS) 82 and the

[103] TrusTrace, https://trustrace.com/
[104] Provenance, https://www.provenance.org/about

Fairtrade Textiles Standard 83 that help to approach supply chain traceability implementation; [105]

- Companies use technological innovations to make value chain traceability more efficient and to boost transparency.[106]

These dynamics are already being applied for many companies in the sector but, as far as the future is concerned, they will become essential conditions. Talking about technological innovations, they help to authenticate the supply chain from start to finish, allowing for a more efficient and reliable form of traceability. First of all, the most known innovation of the last years in the fashion industry is the QR code technology. It is a 2D barcode that can be scanned using devices like the mobile phone in order to get access to much more contents compared to the traditional barcode. This technology is already widespread in the fashion sector, used both for marketing campaigns and for sharing digital contents with users. Regarding traceability, it can be used both internally and externally in order to share information about the supply chain with workers, suppliers, final consumers and, in general, stakeholders. Generally, the QR code is shown on the product label, but can also be printed on boxes, on packaging or on the product itself. The main innovation in its use is the combination of the QR code with other technologies that will be illustrated below.

There are two "track and trace" technologies that are already used in many fashion companies: the Radio Frequency Identification (RFID) and the Near Field Communication (NFC). The RFID exploits a technology that uses real electronic labels able of storing data and information readable by a computer. Communication is one-way from the label to the computer. It is mainly used to simplify product inventories along the supply chain and saves time and resources, thus providing benefits in terms of costs and efficiency. In short, it serves to keep under control any product equipped with RFID tag, because to every label corresponds a one and only product. The NFC technology, similar to RFID, provides a bidirectional wireless communication which allows two devices to create a network and exchange information with each other at a short distance. It has the same

[105] For global certifications and standards see chapter 1.3.
[106] Amed I., Berg A., Balchandani A., Andersson J., Hedrich S., Young R., *The State of Fashion 2019*, Business of Fashion and McKinsey&Company, 2018, p. 61.

function of the RFID label, but with lower costs. Both the RFID and the NFC labels can be equipped with a barcode or a QR code containing information about the product, accessible internally or also externally to the final consumer.

A very innovative technology is the blockchain: introduced for the first time in 2009 by its founder Natoshi Sakatomo and mainly linked to the system of Bitcoins or cryptocurrencies, in recent years this technology has developed features also in other economic sectors including the fashion industry, in which it recently started to take the first steps. Blockchain is based on a decentralized system of information recorded in a database (or digital ledger) and shared within a community called "network". It can be public or private, free or accessible only to certain companies or individuals. When a user enters information within the digital ledger it will be available and visible to each member of the network, who will be able to follow the history of the incoming information. Within the network, each member keeps his or her copy of personal information which will be updated if a product changes ownership, constituting a guarantee certificate on compliance with certain production standards.[107] The fact that the blockchain update takes place without relying on a central administration allows companies to interact directly with their consumers and consequently increase the sense of belonging to the brand. In order to preserve the transparency of the system, every change is authenticated by the members of the network: in this way the decision of most users is privileged, making it almost impossible for individuals to alter it. According to a report presented at the World Economic Forum 2020 Annual Meeting in Davos, despite the great potential of the blockchain, the challenge is the fact of not having a single-source platform, as each company relies on different platforms and it becomes difficult for the consumer to access differently shared data each time and interpret them. In January 2019, Everledger, the International Trade Centre (ITC), Lenzing Group and its blockchain solution-provider TextileGenesis, supported by the World Economic Forum, tried to demonstrate that the problem of visualizing data from different platforms could be overcome. The first results were presented during the World Economic Forum 2020, demonstrating that data from two different blockchain-

[107] Blockchain4Innovation, https://www.blockchain4innovation.it/luxury/la-rivoluzione-della-blockchain-nel-fashion-luxury/

based systems could be aggregated and visualized in a third platform.[108] This has been an enormous innovation but there are still some problems regarding privacy of companies, which data will be available and for who and additional risks. In order to successfully develop a common platform, there is the need for collaboration among all the stakeholders and players in the sector.

The first garment in the World traced with blockchain technology had been presented at the Solutions Lab of the Copenhagen Fashion Summit in Denmark in May 2017.[109] The technology was applied to record and trace, through an application, each phase of the journey of a pile of alpacas, from the shearing on the farm to the spinning, knitting and finishing, thus giving customers and buyers the possibility to know the digital history of the garment by scanning a QR code on the label. Martine Jarlgaard, a London designer and founder of the brand that bears her name, in 2017 produced the first collection applying smart labels to garments and involving the consumer in the production process using location mapping devices. The project has been realized in collaboration with Provenance, the digital platform for brands' transparency mentioned in the previous section.[110] Products are tracked using Blockchain technology, which is made accessible to the final consumer through a QR code or an NFC tag which link to the Provenance app. Martine Jarlgaard's value proposition is a mix of sustainability, technology and fashion: the future of this industry.[111]

[108] World Economic Forum, *An Open Platform for Traceability: Accelerating Transparency and Sustainability across Manufacturing Ecosystems*, 2020.
[109] The Copenhagen Fashion Summit is a business event regarding fashion and sustainability organized by the Global Fashion Agenda, which takes place every year in Copenhagen to discuss environmental and social problems in the fashion industry. Source: https://www.copenhagenfashionsummit.com/about/
[110] For further information: https://www.provenance.org/about
[111] Information took from the video presentation of the brand. Available here: https://youtu.be/2mkxiZ1Q9t4

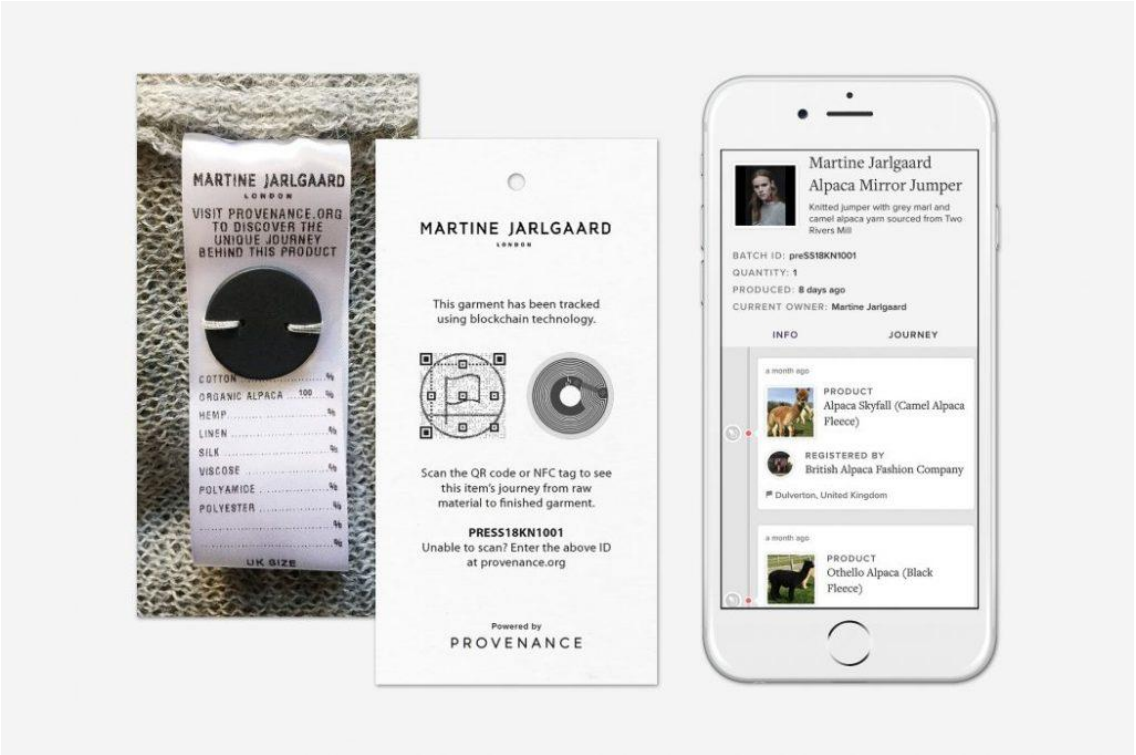

Figure 11: Traceability technologies applied in Martine Jarlgaard collection. Source: Forbes.

The main advantages of a traceability system involving the Blockchain technology are:

- Having a unique ID that moves with the product along the value chain;
- Collaboration among actors along the value chain, who collect data and keep information in the network updated;
- Integration among physical and digital universe, to guide companies towards innovation.

The combination of Blockchain technology with RFID or NFC will allow to track the logistical path of the raw materials, from the supplier to the production company, and of the finished product throughout the distribution process up to the final consumer.

The choice to use one specific technology over another must be calibrated according to the objectives that a company wants to pursue through traceability and by evaluating the costs and benefits of each alternative. In order to succeed in the implementation, a company should try to build relationships with supply chain partners to share information and understand the problems in data collection in order to fix them. Finally, it is important not to be afraid of being the first who innovates, because first movers are

often the winners and others will follow the path of innovation.[112] These technologies represent the future of traceability in the fashion industry and will allow companies to take a big step towards a more transparent and sustainable value chain.

2.4 The Fashion Transparency Index

The *Fashion Transparency Index* is a "review of 200 of the biggest global fashion brands and retailers ranked according to how much they disclose about their social and environmental policies, practices and impact".[113] It was published by the Fashion Revolution Community Interest Company, a non-profit social enterprise which is committed to ensure that transparency and responsibility of the fashion supply chains are on the agenda of governments and companies worldwide.[114] Their mission is to work with people to change the fashion system and make it more responsible, reducing its social and environmental damage. The Fashion Transparency Index is one of their resources to raise public awareness on the issue of supply chain traceability and transparency, which they define as "the first step to transform the industry".[115] This document tells us the level of transparency of 200 of the biggest fashion companies in the World, using as criteria of evaluation the information disclosed about supply chain policies and practises, suppliers and social and environmental impact. The companies analysed were selected on the basis of an annual turnover over US$500 million, belonging to different market segments and coming from all over the World. The results from the Fashion Transparency Index 2019 report show that stakeholders don't have enough information about the supply chains of the fashion companies from which they buy (figure 12).

[112] Bateman A. H., *Tracking the Value of Traceability*, in "Supply Chain Management Review", 2015.
[113] Ditty S., *Fashion Transparency Index 2019*, Fashion Revolution CIC, 2019.
[114] Fashion Revolution, https://www.fashionrevolution.org/about/
[115] Fashion Revolution, https://www.fashionrevolution.org/about/transparency/

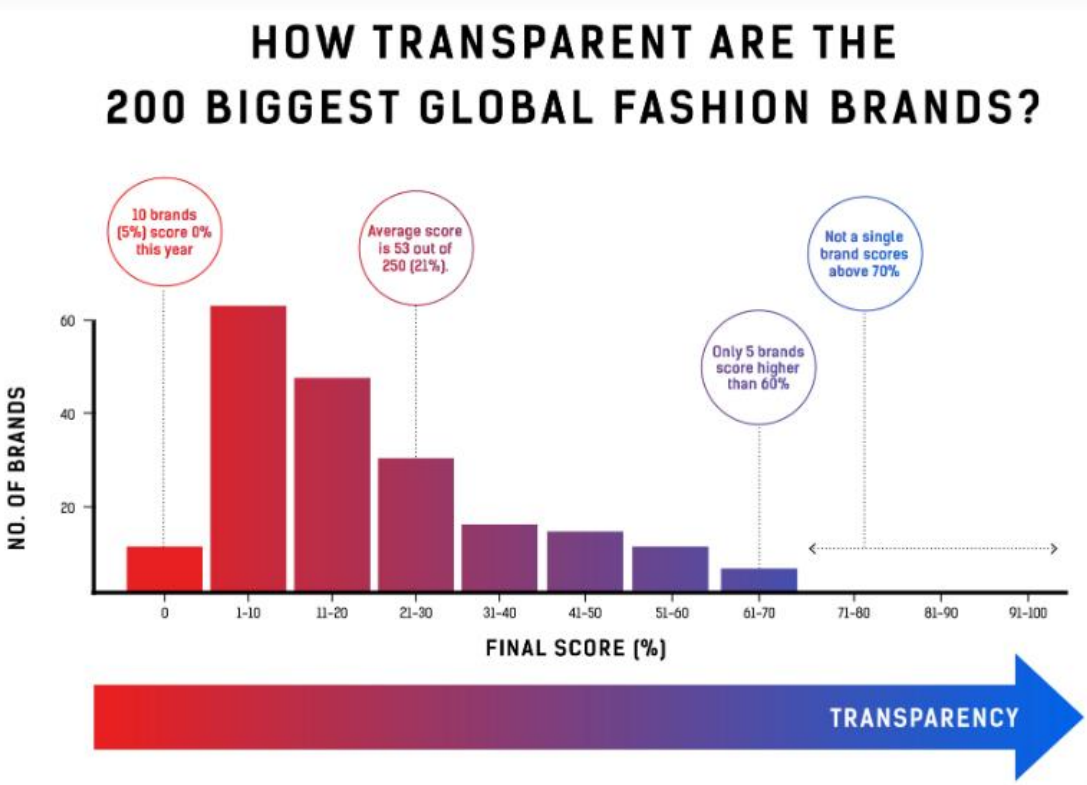

Figure 12: Transparency level of the 200 biggest global fashion brands in 2019. Source: Fashion Transparency Index 2019.

The highest scoring companies are Adidas, Reebok and Patagonia (64%), belonging to the sportswear and outdoor segment, followed by Esprit (62%) and H&M (61%). These data show that there is still a lot of room for improvement for the sector, even if compared to 2018 the general level of transparency has increased by 5%. On one side, the brands analysed disclose a lot of information regarding the ethical and environmental policies implemented and their commitment to sustainability, publishing the direct contacts of employees accountable for CSR policies in the company. On the other side, brands share significantly less information about their social and environmental impact. The interesting fact is that more companies are making the list of suppliers public than in previous years, although still in limited quantities: 70 brands out of 200 are publishing the list of their first-tier manufacturers, while 38 out of 200 the list of their processing facilities and only 10 out of 200 are publishing the list of their suppliers of raw-materials. These data show that the choice of raw materials remains one of the most secret information, both for the fear of losing a competitive advantage and because it is actually difficult to know the precise origin of fibres and materials.

The Fashion Transparency Index is important because the evaluation is not about the level of sustainability of companies analysed, but it is about the information shared externally. It considers the biggest players in the fashion industry, thus giving the possibility to have an overview of the level of transparency of the sector, considering that they constitute the largest part of the worldwide turnover.

2.5 A successful example: Patagonia, Inc.

The consideration of Patagonia, Inc. as an example to follow regarding corporate sustainability and, in particular, traceability and transparency of the supply chain, stems from the fact that the company differs from all the others in the sector because it was born with a mission linked to sustainability. Its mission is: "We are in business to save our home planet. We aim to use the resources we have – our business, our investments, our voice and our imaginations – to do something about it".[116] According to the SustainAbility Leaders Survey, Patagonia is the second most recognised sustainability leader in the World, preceded only by Unilever.[117] However, Patagonia's responsible reputation is growing, narrowing the gap with Unilever. According to the 2018 edition of "The World's Most Innovative Companies" by Fast Company, Patagonia is the sixth most innovative company in the World, for "growing its business every time it amplifies its social mission". [118]

Patagonia, Inc. is a US outdoor clothing and equipment multinational company founded by Yvon Chouinard in 1973 and based in Ventura, California. Its logo is the outline of Mount Fitz Roy, positioned on the border between Chile and Argentina in Patagonia. The founder has a key role in the origins of the company: passionate about climbing and nature, he realized that the steel nails used in the stairways damaged the rocks and decided to start in his garage a production and sale of aluminium climbing equipment, non-harmful for the environment. Chouinard worked alone, until he became a partner

[116] Patagonia, https://eu.patagonia.com/it/it/company-info.html
[117] GlobeScan, SustainAbility, *The 2019 Sustainability Leaders*, 2019, pp. 16 – 18.
[118] Fast Company, *The World's 50 Most Innovative Companies 2018*. Available here: https://www.fastcompany.com/most-innovative-companies/2018

of Tom Frost, improving the quality and volume of its products. In 1970 they discovered that rugby shirts were very resistant and durable for climbing, so they started selling them as outdoor clothing, entering the textile market and creating, three years later, the brand called "Patagonia". As mentioned before, their short-term economic objectives are reconciled with long-term sustainable ones: creation of high-quality products, lasting, recyclable and respectful of the environment. The current CEO is Rose Macario, activist and determined leader. The company has a worldwide presence with its own retail stores located especially in US and Japan, and with its online shop. The supply chain is distributed worldwide, with more than 20 factories producing products with high-quality components. Patagonia is aimed at a niche market, made up of responsible consumers who love nature and sport, and for which it is important to buy responsibly and informedly. In 2011, on the occasion of Black Friday, Patagonia published a famous advertisement in the New York Times[119] that urged readers not to buy the iconic pile Fleece Jacket, listing all the environmental costs necessary to produce it. The aim was to make consumers aware of buying fewer, but high-quality products. An initiative that could prove suicidal for any brand, but not for Patagonia, whose consumers have a high cultural level, such as to understand such a provocation. That year the company saw its revenue grow about 30 percent.[120] This anti-consumerism campaign has been the true beginning of the company's success: Patagonia's sales grow every year, a sign that its consumers do not only buy high-quality products, but also the social and environmental commitment behind them.

[119] PDF version of Patagonia advertisement from November 25, 2011 edition of The New York Times: https://www.patagonia.com/blog/wp-content/uploads/2016/07/nyt_11-25-11.pdf

[120] Tognini M., *Patagonia: storia del leggendario brand e del suo geniale fondatore. Che viaggiava con un'incudine e ha fatto causa a Trump*, in "Business Insider", 2018.

Figure 13: Patagonia advertisement from November 25, 2011 edition of The New York Times. Source: Patagonia.

Patagonia is considered the pioneer of corporate social responsibility in the fashion industry, being the first to introduce the green supply chain management as a key element of business strategy. Every step of their supply chain is managed in order to do business without causing harm to the environment, and every step contributes to their mission.

2.5.1 "We are in business to save our home planet"

Patagonia is the perfect example of how economic, social and environmental sustainability coexist. It is a certified B-Corporation and adheres to the Bluesign standard, both presented in chapter 1. In this section, an analysis of the best practises in terms of sustainability is provided, dividing it according to the steps that make up the value chain.

The first important step is the design of products and the choice of raw materials. Patagonia's design philosophy, according to Miles Jones (senior creative director of Patagonia) is restrictive, combines simplicity and utility and makes Patagonia clothes recognizable, distinguishing them from those of competitors through details.[121] This type of design allows the consumer to wear products regardless of the logic of fashion and collections, giving importance to the function instead of the aesthetics. Regarding materials, Patagonia has innovated and continues to innovate a lot in order to reduce environmental damage and promote circularity. According to Miles Jones, the choice of materials is based on three factors: durability, repair and recycling. The aim is to create an offer of high-quality products that guarantee a good performance during sports and that do not require a production harmful to the environment or people. The company uses both natural and innovative materials, like:

- Organic cotton, produced in Patagonia since 1996 without using chemicals and certified to ensure that it is organically produced;
- Hemp, an alternative natural fibre with a low environmental impact which is soft, breathable and resistant. Its cultivation helps the soil by supplying nutrients and preventing erosion;
- Refibra lyocell, consisting of cotton and cellulose, that uses solvents which are then reused and involves less consumption of water compared to cotton. It is the result of a long process of innovation;
- Tencel lyocell, which is obtained from the pulp of trees dissolved in a non-toxic organic solvent, then reused;
- Yulex, which arises from the need to replace neoprene, considered the more environmentally harmful fabric, with a new equally resistant material. Made

[121] Patagonia, from the blog *The Cleanest Line*. https://www.patagonia.com/blog/2017/10/from-shirt-to-dirt-thoughts-on-the-patagonia-design-philosophy/

from tree rubber, its production uses solar energy, reducing CO2 emissions by 80%. In addition, from 2016, the natural rubber used is Forest Stewardship Council[122] certified.[123]

The use of recycled materials is equally important for Patagonia, in order to reduce the use of natural resources and above all the volumes of harmful waste. For example, recycled wool helps to lessen the impact of wool production, recycled nylon uses waste coming from the textile industry and 100% recycled down uses down coming from second-hand items that can't be resold in the market. In 1993, the company was the first adopter of the fleece, a recycled polyester made of plastic bottles which helps reduce the dependence on oil as a source of raw materials. Using completely zero impact and perfectly recyclable fabrics is impossible if you want to produce clothing with a high level of technology. This is why Patagonia is also forced to use derivative products from the oil industry, but fabrics such as nylon and polyester are totally recycled: were using natural components is not possible, the company chooses recycled materials in order to limit the damage generated by synthetic fibres.

Regarding the production process, Patagonia monitors, improves and measures social and environmental impact. The company is Fairtrade certified and has a Supplier Workplace Code of Conduct based on ILO core labour standards which all the factories must respect in order to work with Patagonia.[124] Patagonia is also a founding member of the Fair Labor Association (FLA)[125], that randomly audits a sampling of their supply chain and which results are of public access on the FLA website. The company is doing his best also in reducing the environmental impact of production, by using renewable energy, promoting bicycle as the best means of transport for its employees and reducing the consumption and pollution of water. The company focuses on the creation of high-quality products by relying on factories and suppliers capable of sharing those values of

[122] The Forest Stewardship Council (FSC) is an international NGO. The FSC has created an internationally recognized forest certification system. The certification aims at the correct forest management and at traceability of derived products. Source: https://fsc.org/en/page/about-us
[123] Patagonia, from the section about materials. https://www.patagonia.com/materials-tech.html
[124] *Supplier Workplace Code of Conduct* available here: https://www.patagonia.com/static/on/demandware.static/-/Library-Sites-PatagoniaShared/default/dwf34abda9/PDF-US/Patagonia_COC_English_02_13.pdf
[125] Fair Labour Association (FLA) is an international organization working with universities, governments and companies to protect workers' rights around the World. Source: https://www.fairlabor.org/

integrity and environmentalism of which it is the bearer of by promoting human, safe and legal working conditions along the entire production chain.

The company keeps going on innovating in order to lengthen the life cycle of products, starting from the choice of materials and up to after-sale services. In 2013, Patagonia launched the project *Worn Wear* with the aim of encouraging customers to take care of their clothing, adopting correct washing methods and repairing them promptly when they break. The aim is to extend the life cycle of products but also to educate consumers to reduce the impact of clothing production on our planet. The Worn Wear Tour reaches every year the main ski resorts to repair the ski clothing of skiers inside a van, while the Worn Wear project takes place also in Patagonia's retail stores. Another service offered to customers is to collect used products in order to resell them, in exchange for a discount on a future purchase.[126] Finally, the company offers a clothing collection service in order to recycle products and components at the end of their life cycle. Unlike the collection of damaged products, this type of service does not offer discounts or reward to the customer as Patagonia believes that recycling old clothes is voluntary.[127]

Figure 14: Worn Wear project in Milan. Source: Outdoor Magazine.

[126] Patagonia, from the *Worn Wear* dedicated section. https://wornwear.patagonia.com/
[127] Patagonia, from the section about recycling. https://www.patagonia.com/recycling.html

What drives consumers to trust in Patagonia, in addition to guaranteeing quality and sustainability, is the concrete commitment to environmental causes. For example, in protest of Trump's election as president of the United States in 2016, Patagonia announced that it wanted to donate all the profits from Black Friday to hundreds of local environmental organizations, as a sign of protest towards an environmentally harmful policy. The company raised $ 10 million, 7 more than the previous year. The choice costed the company a loss of earnings, but 60% of the buyers were new consumers, thus giving the company a long-term gain in terms of loyal customers.[128] This represents a demonstration of how sustainability can generate non-economic but also economic gains at the same time, if the stakeholders are sufficiently sensitive to this issue. Since 1985, the company has donated 1% of its annual profits to environmental organizations and companies engaged in the search for strategic solutions to deal with the environmental crisis. This initiative is called *1% for the Planet*, and it is now an alliance of businesses that understand the environmental risk generated by human actions.[129] During 2020 Patagonia will donate 20 million dollars to numerous environmental NGOs, thanks to the donations collected since the last Black Friday in November: on that occasion, the company had committed to double every single cash offer made between November 29 and December 31 through the *Patagonia Action Works* platform, until reaching the threshold of 10 million dollars. A milestone that has already been achieved after 17 days[130]. Patagonia Action Works is a digital platform launched in Europe to connect people sensitive to environmental causes with local NGOs that need support. Registration is free and allows people to choose the closest geographic area on which they can focus to give help.[131]

A necessary condition for this sustainable strategy to be applicable is traceability, which is also indispensable for ensuring transparency to a conscious and demanding consumer.

[128] Beer J., *How Patagonia Grows Every Time It Amplifies Its Social Mission*, in "Fast Company", 2018.
[129] For further information regarding *1% For the Planet*: https://www.patagonia.com/one-percent-for-the-planet.html
[130] Beghelli C., *Patagonia donerà 20 milioni di dollari a Ong ambientaliste di tutto il mondo*, in "Il Sole 24 Ore", 2019.
[131] Patagonia, from the *Action Works* section.
https://www.patagonia.com/actionworks/#!/explore/home

2.5.2 Traceability and transparency in Patagonia, Inc.

Traceability is a factor that has always distinguished Patagonia and on which the transparency of the company and the trust of stakeholders are based. There are two measures which represents an example of successful traceability systems: Patagonia Traceable Down and the Footprint Chronicles. Patagonia is the first brand in the World to be certified to the *Traceable Down Standard*.[132] It means that down is traced at each step of the supply chain, from the farm to the factory, in order to ensure that geese are protected by strong animal welfare, in particular against force-feeding and live-plucking. In 2018 the company improved further and achieved the certification of Advanced Global Traceable Down Standard, thus covering both internal traceability systems and distribution centres. This allowed to certify not only down used inside of clothes, but also the final product. In order to implement this traceability system, Patagonia started from audits to the parent farms where geese are raised to produce eggs and where there are the biggest risks of mistreatment. The company does not get the down from these farms; however, they care about animals' welfare even at the beginning of the supply chain. The down used for clothing comes from slaughterhouses where geese have already been killed for the food industry, and, after it is collected, it is followed in its washing, processing and sorting in order to ensure traceability through product segregation (mentioned in section 2.2.1). Audits continue all the way to the factory, to ensure that traced down is separated from the other. Even when the product is ready, audits continue to the distribution centre, where clothes are packaged and sent to the retailers.[133] This is also verified and guaranteed by NSF International, an American organization for testing, inspection and certification of products. This process requires a strong investment in terms of resources, costs and time and collaboration among every actor in the supply chain, but the result is a 100% traceable high-quality product that ensures respect for animals.

[132] *Traceable Down Standard* available here: https://www.patagonia.com/static/on/demandware.static/-/Library-Sites-PatagoniaShared/default/dw05a97bdc/PDF-US/PATAGONIA_TRACEABLE_DOWN_STANDARD_121013.pdf

[133] Patagonia, from the *Traceable Down* section. https://www.patagonia.com/traceable-down.html

An additional traceability system used by Patagonia is *The Footprint Chronicles,* which reconstructs the company's supply chain. Through this web page, everyone can get the access to a map where the precise geographic locations of textile mills, factories and farms are reported. By clicking on each of these icons, it is possible to have a description of the supplier, with name, address, how long it has been working with Patagonia, number of workers, gender ratio and which items are produced there. In the same web page, the list of finished goods suppliers is publicly available, updated twice per year, in May and in November. In addition, every supplier must complete a sourcing questionnaire and track his supply chain in order to work with Patagonia.[134] This is a great example of supply chain traceability that perfectly fits with consumers' need to know company's commitment towards sustainability.

Figure 15: The Footprint Chronicles. Source: Patagonia.

In addition, Patagonia annually draws up a report related to the benefits that corporate strategies bring to the environment, all supported by numerical data. The document is called *Annual Benefit Corporation Report* and indicates six specific purposes to be achieved to gain public benefits:

[134] Patagonia, from *The Footprint Chronicles* section. https://www.patagonia.com/footprint.html

- *1% for the Planet*, with the precise amount donated every year to non-profit organizations promoting sustainability, which corresponds to the 1% of their annual net revenues;
- *Build the Best Product with No Unnecessary Harm*, showing data about materials used, quality scores, number of garments repaired and quantity of recycled products;
- *Conduct Operations Causing No Unnecessary Harm*, showing data about annual reduction of their environmental footprint and the impact of their operations on natural resources;
- *Sharing Best Practices with Other Companies*, with data about internally and externally shared information and best practices;
- *Transparency*, with their commitment to share information to every stakeholder about their environmental impact;
- *Providing a Supportive Work Environment,* with their commitment to support workers and give them a high-quality health care at work.[135]

Every year Patagonia updates data about these purposes with the publication of the report. To date Patagonia donated $104 million to support environmental causes since 1985, involved 500 employees in supporting non-profit organizations, made 52% of fabrics from recycled or renewable sources, repaired 100,288 garments globally through its initiatives and gave a Fairtrade premium to 42,000 apparel workers. Transparent communication of corporate behaviour is also guaranteed by *The Cleanest Line*, a blog for employees and customers that deals with sustainability issues in an engaging way and with direct testimonials from inside and outside the company.[136] Under the section "our footprint" it is possible to find articles concerning the concrete commitment of Patagonia in reducing the environmental damage caused by the production of clothing and equipment.

This is only a part of all the benefits that Patagonia, with its business activity, brings to environment and people. In addition to this, the company is successful because it

[135] Patagonia Annual Benefit Corporation 2018 report available here: https://www.patagonia.com/static/on/demandware.static/-/Library-Sites-PatagoniaShared/default/dw08d0f6ed/PDF-US/2018-B-CorpReport-050919.pdf
[136] For further information about *The Cleanest Line*: https://www.patagonia.com/blog/

manages to generate greater economic growth every year, expanding its presence all over the world. This is a unique case in the World and a successful example to follow because the brand is inseparable from its environmental and social advocacy. Everything is connected to and aimed at sustainable development. This has been possible also because Patagonia's consumers purchase in a conscious and informed way: according to a survey by YouGov[137], 69% of Patagonia's customers are interested into knowing from where their products come from, 67% believe in the importance of protecting environment and 54% make efforts to buy Fairtrade certified products. These results show how environmentally concerned consumers trust the company and, at the same time, its values. Patagonia was able to deliver the message that it has a higher purpose than simply making money, so that people support its causes and its values by purchasing its products. Patagonia demonstrated that people's trust is also gained by trying to teach something, spreading a new culture which, at first - according to the old paradigm of distorted brand representation - might seem counterproductive, but which instead strengthens the bond with its customers.

2.6 A successful example: Monnalisa S.p.A.

In order to provide an example of a smaller reality, the strategy of Monnalisa S.p.A. is presented as a successful case of the implementation of supply chain traceability. Founded in 1968 in Arezzo (Italy), the company produces and sells luxury clothing for children from 0 to 16 years. Monnalisa has over 300 employees and a 2018 turnover of € 51 million, of which 57% from the domestic area (17 countries in Europe) and 43% from the overseas area (Eastern Europe, Russia, Asia, Middle East, North and South America) with 68% of export.[138] The company operates through four distribution channels: corporate retail, wholesale mono-brand, wholesale and e-commerce. The mission of the company is based on:

- Creativity and innovation, to create high-quality products;

[137] Hiebert P., *A look at the type of person who shops at Patagonia*, in "YouGov", 2017.
[138] Monnalisa, https://group.monnalisa.eu/company-profile/

- Commitment and transparency, to be reliable and environmentally friendly;
- Care and dedication in relationships with the stakeholders.

The company is certified ISO 9001, an international standard for Quality Management Systems[139], SA 8000 and ISO 14001. As said in the first chapter, these last two certifications are important because are internationally recognised standards regarding corporate social responsibility and environmental management systems. This means that the value chain is checked at least six times every year through external audits, and that the company must select and control suppliers also from an environmental and ethical point of view. The SA8000 standard aims to express the requirements to be respected in the workplace which include workers' rights, workplace conditions and the management system. The ISO 14001 certification shows that the organization has an adequate management system to keep the environmental impacts of its activities under control, and systematically seeks its improvement in a coherent, effective and above all sustainable way. A digital copy of the compliance with standards is reported on the website.[140] In addition, the company has included a code of conduct as a contractual clause in contracts with suppliers and requires them to comply with SA 8000 requirements, a sign of a real commitment to sustainability. The code of conduct includes the prohibition of child labour, of forced and compulsory labour, of harassment and discrimination, and promotes freedom of association, right working hours, fair pay and a healthy and safe working environment. The company code of ethics is publicly available on Monnalisa's website, in which the company undertakes to comply with ethical and environmental guidelines and principles based on respect for the stakeholders.[141] Monnalisa's environmental policy envisages reducing environmental impacts by controlling emissions, lowering energy and water consumption, using substances that are not harmful to the territory and preventing excessive consumption

[139] The ISO 9001 standard defines the requirements of a quality management system for an organization. It is the reference standard for those who want to subject their production process to quality control in a cyclical way, starting from the definition of the requirements of customers, expressed and not, and going as far as monitoring the entire production process. Source: https://www.iso.org/iso-9001-quality-management.html

[140] Monnalisa, from the section about certifications. https://www.monnalisa.com/it-it/corporate/certificazioni/

[141] Monnalisa's code of ethics available here: https://group.monnalisa.eu/wp-content/uploads/2018/06/Monnalisa-Codice-EticoDEF-1.pdf

of resources. In addition, the company conducts training programs for the staff so that each employee understands his environmental responsibility. In this perspective, as mentioned above, Monnalisa intends to implement and maintain an effective Environmental Management System (EMS) compliant with the voluntary international standard ISO 14001. The aim of adopting the EMS is to define and implement strategies and action plans for the optimization of business processes considering the environmental matrix and the protection of natural and energy resources.

A necessary condition for this sustainable strategy to be applicable is traceability, which is also indispensable for ensuring transparency to a conscious and demanding consumer.

2.6.1 Traceability and transparency in Monnalisa S.p.A.

Since 2011, Monnalisa has included supply chain traceability through various projects in its corporate strategy. The company defines traceability as the set of information on the origin of the product which allows to reconstruct its history through the identification and documentation of all the activities, the materials used, and the companies involved. This means the ability to keep track of the production path along the supply chain, from start to finish.[142] The choice to invest in traceability derives from the company's need to control the parallel grey market, which refers to the flow of goods through distribution channels other than those authorized or those designed by the producer, and to improve the customer experience. The company started implementing traceability through the use of RFID technology (explained in section 2.3.2) with the aim of making logistics processes more efficient, but after three years they decided to stop using it. Instead of RFID, the company uses the QR code, through which all clothing is tracked. The label with QR code is more effective from a market control point of view, it guarantees the same traceability and has much lower costs than the RFID tag. Using the QR code, the final consumer can get access to information about the product by accessing a dedicated area in Monnalisa's website and by inserting the unique identification code shown on the label. The consumer is thus able to collect information about the materials used, the

[142] Rinaldi Romana F., Testa S., *L'impresa moda responsabile*, Milano, EGEA, 2013, p. 71.

production journey of the product and the suppliers involved, as a guarantee of quality and transparency.[143] In 2020 the company will decide whether to continue only in this direction or whether to integrate again the RFID technology in 2021. The currently measurable benefits that the company has been able to obtain from traceability are the greater control of the supply chain and the elimination of problems that affected its efficiency. According to Guido Cappelli, Certifications and Operations manager for Monnalisa, in the following years traceability will become mandatory in order to grant transparency towards stakeholders and the fact that it has already been implemented for several years will constitute a competitive advantage for the company. As regards the future, Monnalisa is working on the creation of a green product linked to the recovery of fabric waste from the cutting phases. The product will be equipped with a QR code label or an RFID tag in order to guarantee complete traceability and communicate transparency and sustainability of the supply chain to the final consumer.[144]

Monnalisa's social responsibility policy takes into consideration every stakeholder, and in particular the consumer policy says that the company is committed to building a lasting relationship based on a high quality product, thanks to the continuous efforts in research and development, in the verification of materials, in the optimization of the processing phases, in the control and support of suppliers, in the research and development of new proposals. According to this statement, the business model is publicly available in the company profile's presentation, and with it also the structure of the supply chain. [145] The product design and development take place within the company, to grant continuous innovation, while raw materials are bought from external suppliers and selected, controlled and tested by Monnalisa. The transformation phases are outsourced to small companies located in central Italy and subjected to external audits in order to maintain an effective control over all phases of the supply chain. All

[143] Rinaldi Romana F., Testa S., *L'impresa moda responsabile*, Milano, EGEA, 2013, p. 72.
[144] The source used for this paragraph is an email interview with Guido Cappelli, Certifications and Operations manager for Monnalisa S.p.A. The full interview is available in the appendix.
[145] Company profile available here: https://group.monnalisa.eu/wp-content/uploads/2019/08/Company-Profile-2019-EN-Alta.pdf

this information is available for every stakeholder on company's website, from suppliers and clients to the final consumer, to grant transparency and data availability (figure 16).

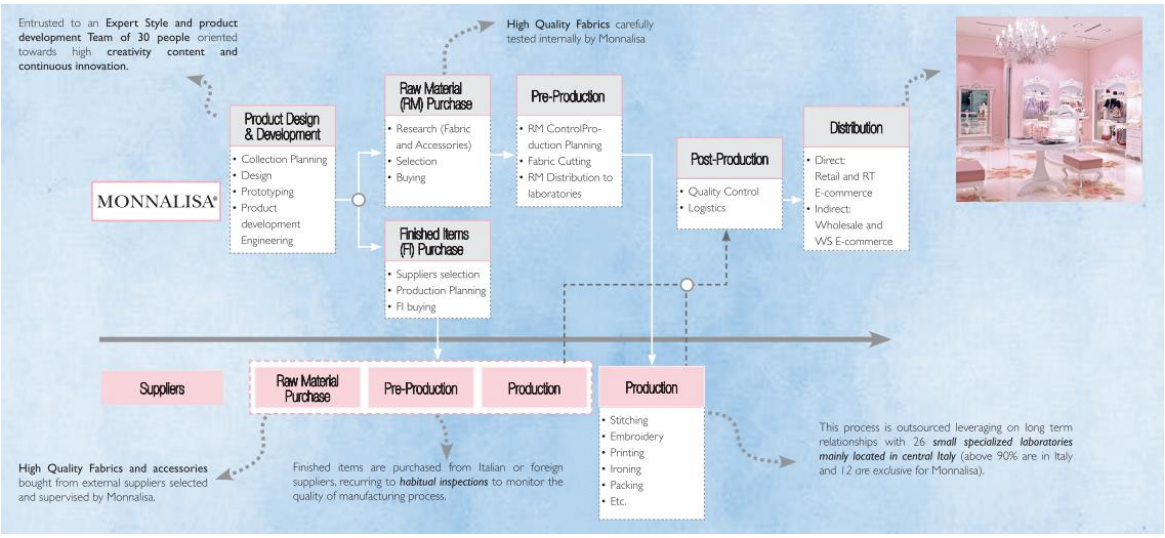

Figure 16: Monnalisa's supply chain structure. Source: Monnalisa.

In 2019 the company published the Integrated Report 2018 for the first time, drawn up according to the framework of the International Integrated Reporting Council (IIRC) and adopting, as sustainability reporting criteria, the GRI Standards, defined by the Global Reporting Initiative (explained in chapter 1.4.3). The document aims to provide a complete view of Monnalisa's business model and results, through the analysis of all the aspects that guide the company's ability to create sustainable, long-lasting value in favour of its stakeholders. The firm wants to communicate not only the economic and financial results, but also answers to the social and environmental issues that guide the corporate decision-making processes, the definition of the strategy, the governance and the business model. According to the report, in 2018 Monnalisa generated a growth in financial terms, especially in online sales, but also an increase in the company's contribution to the achievement of the Sustainable Development Goals set by the 2030 Agenda. The Integrated Report was drawn up by collaborating with stakeholders and analysing each phase of the value chain, in order to highlight the main impacts of business management on the three dimensions of sustainability: economic, social and environmental. An analysis of Monnalisa's performance was imposed on these areas, in

order to involve all business aspects in achieving sustainable development. Regarding social responsibility, the company is committed to improve training and internal communication on sustainability issues and to continue to grant workers' health and safety; while regarding environmental responsibility the company is committed to focus its efforts on energy, supply chain and waste. The report document aims to demonstrate company's commitment in sustainability issues in order to be transparent towards stakeholders and keeps track of the value created and of the impacts of company's activity.

Monnalisa is an example of how sustainability and traceability can be integrated in the business strategy to make production more efficient and align with the Sustainable Development Goals set by the 2030 Agenda, but also to guarantee the transparency of the supply chain required by the final consumer. The company was not born with an environmental or social mission but decided to integrate them later because it understood that they are a fundamental requirement for the success in the fashion industry of the future.

3. Case studies: implementation of traceability for sustainability

3.1 Methodology

In order to provide some practical examples of the integration of sustainability in companies' strategy using traceability, four case studies are presented and analysed. In collaboration with the research laboratory and project with firms "Tracciabilità per la sostenibilità: valore economico e design" by Ca' Foscari University of Venice and IUAV University of Venice[146], the methodology used is a face to face qualitative interview. A group of four companies belonging to the footwear industry was selected to understand what they are doing in terms of sustainability, if they are interested in improving their efforts and the role of traceability in their future projects. A semi-structured qualitative interview was used as method of analysis, because of different reasons:

- the aim was to avoid imposing the interviewer's structures and assumptions;
- questions required articulated answers depending on the companies interviewed;
- there were concepts and variables that could be different from those predicted by the interviewer, and new topics that could emerge from the interview.

The advantage of conducting a qualitative interview was the opportunity to add questions if needed and to ask for feedback and clarifications, allowing to conduct a more detailed final analysis. Furthermore, qualitative methods are useful when the questions can't be answered with a simple affirmative or negative hypothesis. Qualitative studies are particularly effective for answering questions such as "How?" or

[146] In this project, the issue of traceability is addressed in relation to sustainability through the study of design solutions in concert with local businesses. The aim of the project is to highlight how the technological detection systems can find application and development also in relation to the broader questions concerning economic and environmental sustainability. For further information: http://www.politecnicocalzaturiero.it/web/politecnicocalzaturiero/gate.nsf/contents/attivita?openform&id=83CADF637080167AC125835800341F90

"What?" and to fully argue a topic of interest.[147] Finally, from the respondent's point of view, a qualitative interview gives the freedom to express his/her opinion and to clarify complex answers.

The sample was selected based on the sector to which it belongs and on the size of the companies. It is composed by small-medium Italian enterprises based in Veneto and working in the footwear manufacturing industry. The regional accounting data for 2017, released by Istat in December 2018, indicates that Veneto has been one of the leading regions of the entire national economy, being the third region in Italy for wealth production, after Lombardy and Lazio. In the 2014-2016 period, it is estimated that 52.5% of Veneto's industrial and service companies with at least 10 employees have introduced innovations, presenting an innovative propensity greater than the national context. There are currently around 100 companies in Veneto whose social responsibility system is certified to the requirements of the SA8000 standard, as a guarantee of the ethics of its production cycle, and 1,303 companies ISO 14001 certified. The region of Veneto is moving toward a more transparent and innovative production, working for a durable and conscious growth, thus stimulating companies to take part into this context.[148] As said before, the companies analysed are participating in the research laboratory "Tracciabilità per la sostenibilità: valore economico e design" to work on traceability and understand its benefits both for the efficiency of processes and the sustainability of production.

The structure of the interview can be divided into three main topics, each of them developed through some questions, illustrated in table 1, 2 and 3. In the interviews, we talk about sustainability intended as the manufacturing, marketing and use of garment, footwear and accessories, and its parts and components, taking into account the environmental, health, human rights and socio-economic impacts, and their continuous improvement through all stages of the product's life cycle (from design, raw material production, manufacturing, transport, storage, marketing and final sale, to use, reuse, repair, remake and recycling of the product and its parts and components); while

[147] Flick U., von Kardorff E., Steinke I., *A Companion to Qualitative Research,* SAGE Publications*,* 2004, pp. 203 – 204.
[148] Veneto Region, *Rapporto statistico 2019. Equilibrio*, 2019. For further information: http://statistica.regione.veneto.it/Pubblicazioni/RapportoStatistico2019/index.html

traceability is intended as “the ability to trace the history, application or location of an object” in a supply chain[149], and “the process by which enterprises track materials and products and the conditions in which they were produced through the supply chain”.[150]

Table 1: First topic of the interview.

TOPIC 1: INFORMATION ABOUT COMPANY
What is your consumer target?
In which geographical area are your sales concentrated?
What is your core business?

Table 2: Second topic of the interview.

TOPIC 2: SUSTAINABLE STRATEGIES IMPLEMENTED
What is the role of sustainability inside the company?
Is sustainability important for the company?
Do you integrate sustainability in the production process?

Table 3: Third topic of the interview.

TOPIC 3: SUSTAINABLE STRATEGIES FOR THE FUTURE
Do you think that using traceability measures would be useful to the company? How?
Are you working on inserting the “talking label” on products?
Which contents would you want to communicate with the “talking label”?
Is the management of waste materials a cost for the company?
Do you think that circular economy could solve the problem of waste materials?
Do you draw up a CSR report?

The questions from the first topic aim to delineate the company profile, the ones from the second topic describe what the companies are currently doing in the sustainability field and the questions from the third topic aim to understand where the company wants to go in the future, using traceability to improve processes and communicating what they are doing. The questions in the tables have been used as guidelines for the interview, but for every case study new question were added, depending on the firm

[149] ISO 9001:2015. Available here: https://www.iso.org/obp/ui/#iso:std:iso:9000:ed-4:v1:en
[150] OECD, *OECD Due Diligence Guidance for Responsible Supply Chains in the Garment and Footwear Sector*, 2017, p. 15.

analysed and on its needs. In the following section the four case studies are described and analysed.

3.2 Qualitative interviews

For each company analysed, a summary of the interview is reported, based on the topics addressed through the questions presented in the tables.

3.2.1 Gianfort S.r.l.

Figure 17: Gianfort S.r.l. - company logo. Source: company's website.

Respondents: Diego Simoncello and Elisabetta Tasca (administration)

Website: https://www.gianfort.it/

Gianfort is a small Italian enterprise located in Casoni, Vicenza. The production is divided into two main segments: police and army footwear and high-quality footwear for women and men. The analysis will take into consideration only the second market. The company is located in a both strategic and disadvantageous geographical area, between the Riviera del Brenta district of elegant shoes and the Montebelluna district of sport footwear. Gianfort has a strong tie with the local territory, mostly due to the manpower that characterizes its production: labor techniques are handed down from person to person, giving quality to shoes.

With the answers from the first topic (table 1 – Information about company), what emerged was that its main consumer target are men looking for elegant shoes and who prefer purchasing in physical shops rather than on-line. Their main market is located in

Alto Adige (Italy), and in particular in the city of Dobbiaco, Bolzano. They have two core businesses: contractors who commission to Gianfort the production of shoes that will be sold on the market with another brand and retailers who sell Gianfort's branded products directly to the final consumer. Gianfort has a proprietary brand called *Alexander*, a luxury line of handmade shoes for men sold also on-line in a dedicated website.[151]

With the answers from the second topic (table 2 – Sustainable strategies implemented), what emerged is a concrete commitment in integrating sustainable activities into corporate strategy through different initiatives:

- the company obtains leather for its shoes from a 100% sustainable supplier (vegetable tanning, use of photovoltaic energy, water purification to put it back in nature and recycling of materials) and from companies located in Tuscany that comply with standards and regulations. For internal production, Gianfort is testing a water-based glue that could provide advantages for both the environment and the workers, who would no longer stay in contact with chemicals. Moreover, the company works mostly with seams instead of glue, which reduces the use of harmful substances;
- the company outsources only some processes, like cutting and edging, but maintains control over materials and substances used in that processes, which are environmentally friendly;
- the company is certified Bureau Veritas, a French company of global importance in the assessment and analysis of risks related to quality, environment, health, safety and social responsibility. It is also certified ISO 14001, presented in chapter 1.3.1, and Ecolabel, mentioned in chapter 1.3;
- the company is thinking of replacing the old machinery still in use with new low consumption machines and has future plans about energy consumption and emissions;
- the company collaborates with universities and public entities and donates to non-profit entities.

[151] For further information: www.alexandershoes.it

With the answers from the third topic (table 3 – Sustainable strategies for the future), what emerged was their interest in circularity applied to the use of leather scraps, in particular those deriving from uppers during the cutting phase. A possible solution for the future could be the use of traceability to map processes in order to understand which are the ones that produce more waste, and then map the quantity and the type of scraps. This would allow the company to have a clear idea of the costs and of the quantities deriving from the production of waste, using this information to start introducing circular economy in the value chain. At the end of their life cycle, leather scraps can be reused directly inside the company or can be sold to other organizations to be utilized in other type of production, according to the circular economy definition given by the Ellen Macarthur Foundation and discussed in the first chapter.[152] This would allow to reduce the total cost of waste materials and, at the same time, help to make processes more efficient and limit the environmental damage. Traceability could be used also to map materials and processes in order to understand if they comply with some of the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda (see chapter 1.1.2), or if they can be modified in order to conform with the goals. Once this project is put into practise, it would be useful for the company to communicate this commitment to its stakeholders, using the Corporate Social Responsibility report. For example, the fact that Gianfort obtains leather from a 100% sustainable supplier, could be a form of application of the SDG number 12 - Responsible consumption and production.

3.2.2 Voltan 1898

[152] "A circular economy is an industrial system that is restorative or regenerative by intention and design. It replaces the 'end-of-life' concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models". Source: Ellen MacArthur Foundation, *Towards the circular economy. Economic and business rationale for an accelerated transition*, vol.1, 2013, p.7.

Figure 18: Voltan 1898 - company logo. Source: company's website.

Respondent: Martina Marcato (accounting)

Website: https://voltan1898.com/

Voltan is the oldest shoe factory in the Riviera del Brenta district of footwear manufacturing, and also the first in Italy to have started a mechanized production of shoes. The founder, Luigi Voltan, came to Italy bringing machinery and innovation from America: he was in fact one of the first to apply the concept of corporate welfare, providing homes and services for workers near the workplace. Founded in 1898, Voltan is a small enterprise located in Strà, Venezia, in the Riviera del Brenta district. It produces luxury shoes for women, and has a strong tie with territory, tradition and manpower, even if the collaboration within the district is rare or almost absent.

From the questions of the first topic (table 1 – Information about company) it emerged that the consumer target of the company is a rich and fashion woman, traditional but also eccentric, and able to understand the quality of materials and the handmade products. The main market is Northern Europe, in particular Belgium and Benelux, and China and Japan. Indeed, in Belgium the brand *Voltan 1898* is equated with brands like Jimmy Choo, and in the shops it is displayed alongside well-known luxury brands. Their core businesses are contractors who commission to Voltan the production of shoes that will be sold on the market with another brand, retailers who sell Voltan 1898 branded products directly to the final consumer and their outlet store located in Strà, Venezia. The company has also a proprietary brand called *Alexandra Voltan,* a luxury line of handmade shoes for women that inspires its collections to the city of Venice and that is sold in shops and on-line in a dedicated website[153], and another one called *V Season*, which has a more eccentric style and is sold in a dedicated showroom in Milan.[154]

[153] For further information: https://www.alexandravoltan.it/
[154] For further information: https://vseasonshoes.it/

From the questions of the second topic (table 2 – Sustainable strategies implemented), what emerged is that the company pays attention to sustainability, integrating it within its production process in different ways:

- use of energy from a photovoltaic system;
- limitations in the use of chemical materials, such as the use of water-based glue instead of the traditional one;
- attention to the health of employees working in the production process.

From the questions of the third topic (table 3 – Sustainable strategies for the future), what emerged is the desire to communicate contents regarding the brand *V Season.* The brand is described as charismatic and eccentric, and with a target "represented by an intellectually and professionally mature woman, estimated between 30 and 50 years old, self-confident, charismatic, with a strong communicative power. Her personal mission is to express herself not only through words and actions, but also through looks designed to catch the eye" (from vseasonshoes.it). The company wants to create some contents to transmit this message through the use of a talking label containing a QR code to be inserted inside the packaging of shoes. The contents must tell the story of tradition and innovation of the product by attracting attention and by using images or videos that reflect the soul of the brand. This objective for the future would be useful not only to communicate engaging contents, but also to allow the final consumer to track the products and understand their origins, in order to enjoy the communicative benefits of traceability. Another important topic for discussion was the management of waste materials. Currently, the company has no recycling systems and does not differentiate waste, which all ends up in a container. To solve this problem, the firm could map the scraps to understand type, quantity and quality, and then recycle them if possible. Recycling directly inside the company is a difficult process to put in practice, so an alternative could be to sell them to external organizations that could use them in other ways, considering that Voltan works with high-quality and expensive materials, in particular leather. This would allow the company to reduce disposal costs and, at the same time, implement a circular economy that promotes reuse and limits waste and pollution. Linked to the recycling of leather scraps, an idea could be to create a shoes line from recycled materials and tell the story of this products. Together with the

sustainable activities already put in practice by the company, this future goals and ideas could be used as contents to be communicated within a Corporate Social Responsibility (CSR) report.

3.2.3 Calzaturificio Bellò

Figure 19: Calzaturificio Bellò - company logo. Source: company's website.

Respondent: Federico Bellò (administration and design)

Website: http://www.calzaturificiobello.it/

Founded in 1962, Calzaturificio Bellò is a small Italian enterprise located in Vigonovo, Venezia. It belongs to the Riviera del Brenta district of footwear manufacturing and has a strong tie with territory, handcraft and tradition. The company produces high-quality shoes for men and women, characterized by elegance and classicism and completely made in Italy.

From the questions of the first topic (table 1 – Information about company), what emerged is that their main markets are located in Northern Europe, especially in Germany, because the consumer pays more attention to the quality of the products and to the durability of shoes and appreciates the "Made in Italy" label. The consumer target is characterized by women and men who like to dress elegantly but also comfortably, who are able to distinguish quality materials and who are interested in the origins of the product. Their core businesses are: contractors, who commission the production of shoes that will be sold on the market with another brand, and retailers, who sell Bellò branded products directly to the final consumer. Calzaturificio Bellò owns another proprietary brand, in addition to the brand *Bellò*: *Bellò Heritage*, with shoes with a more vintage and traditional taste combined with a casual style.

From the questions of the second topic (table 2 – Sustainable strategies implemented), what emerged is a strong attention towards sustainability combined with innovation within the production chain. The company produces a line of vegan shoes and organic shoes for an external brand: *NOAH Organic.*[155] These shoes are made of environmentally friendly materials like organic cotton, linen and natural rubber and are handmade in Italy. The models are designed to be lightweight and comfortable, with a minimalist design. Their main market is Northern Europe, where consumers are more interested in sustainable products, in particular if they are made in Italy. The most important aspect of this type of product is innovation, and how it is combined with sustainability. Calzaturificio Bellò, together with Noah Organic, starts from the design to think about circularity: these shoes are projected to be biodegradable, giving a particular attention to their life cycle. This innovation is communicated to the final consumer and to the retailer through a QR code printed on the outside of the shoe box, which directs you directly to Noah Organic's website via mobile phone, allowing the consumer to track the products. This is an example of how innovation can be combined to sustainability and traceability to realize and promote a product good for the environment.

From the questions of the third topic (table 3 – Sustainable strategies for the future), what emerged is that the company needs to communicate what they do to be sustainable. Their objective is to create 100% Bio shoes and share contents about it with consumers. Communication could take place online through their website or through a talking label, but also in physical stores with a dedicated packaging. The aim is to create contents to let people know more information about compostable shoes: how it is made how to dispose it. Another possible idea for the future would be the recycle of shoe boxes made of cardboard, according to the concept of circularity. It would allow to reduce disposal costs and to create sustainable packaging made of recycled paper. Regarding communication, the company does not draw up a Corporate Social Responsibility (CSR) report but is interested in doing it in the future. It highlights the social responsibility of the company and is voluntary and would allow to the firm to communicate its commitment in sustainability activities like welfare, ethics and use of environmentally friendly materials. Calzaturificiò Bellò could use it to attract suppliers

[155] For further information: https://www.noah-shop.com/it/organic

and clients by telling them the design and the production of vegan, vegetarian and organic shoes and by integrating the report during time, adding what they will do in the future.

3.2.4 Stivali S.r.l.

Figure 20: Stivali S.r.l. - proprietary brand logo. Source: company's website.

Respondent: Matteo Martignon (administration)

Website: http://www.stivaleriacavallin.it/

Stivali S.r.l. is a medium-sized Italian enterprise located in Fossò, Venezia. It belongs to the Riviera del Brenta district of footwear manufacturing. The company produces luxury shoes for women, especially high-quality boots. The history of the company is linked to the brand *Stivaleria Cavallin*, born in 1961 and specialized in luxury boots production.[156] In 2015 Stivaleria Cavallin opened a dedicated boutique in Belgravia, London, to sell exclusively its products to well-to-do women who became in time loyal customers. The company produces shoes for Gucci and Salvatore Ferragamo.

From the questions of the first topic (table 1 – Information about company), what emerged is that the consumer target of the company are women who buy exclusive products that are accessible for the few. Their main market is London, UK, where their own shop is located. The company has two core businesses: the production of boots by Stivaleria Cavallin, sold directly to the final consumer in their shop in London, and contractors, like Kering, who commission the production of shoes that will be sold on the market with their brand. Stivaleria Cavallin sells its boots in its boutique located in a rich area of London, allowing customers to purchase limited editions of ready-made styles, but also tailored and personalised boots, improving the buying experience with a

[156] For further information: http://www.stivaleriacavallin.it/

high-quality service. Clients like Gucci and Salvatore Ferragamo trust the craftmanship and the experience of Stivali S.r.l., and that's why they choose to produce here their luxury shoes.

From the questions of the second topic (table 2 – Sustainable strategies implemented), what emerged is that the company has to agree with ethic codes and sustainability principles because it is a supplier of products for Kering, which is known for being one of the most sustainable multinationals in the fashion industry. Regarding Stivaleria Cavallin, sustainability does not have a precise role within the value chain.

From the questions of the third topic (table 3 – Sustainable strategies for the future), what emerged is the innovative use of the talking label: the company is working to use it as a mean of internal traceability. The project is under construction and plans to share instructions and information about the production with internal and external stakeholders who participate in the value chain. The QR code inside the talking label should link to an online platform for workers who obtain the access through an identification, thus having information about the progress of products along the production chain and instructions about the single steps of the chain. This would allow the company to be more efficient in terms of timing, coordination and product traceability. Another way of using the talking label is to develop some contents about Stivaleria Cavallin to communicate to the final consumer. The idea is to tell the history of the brand, the quality of materials and the craftmanship of the process to their clients, both online and in-store. Combined with this, to build trust and create customer loyalty, another idea is to associate every purchase with an ID code, providing customers with an app to monitor the creation of their order. This would allow the consumer to track its product from the creation to the after-sale, creating at the same time a network of clients wearing Stivaleria Cavallin's boots. Leather scraps are not a problem for the company, since not so many scraps are produced from Stivaleria Cavallin boots, while from those of Gucci or external brands the leather cannot be reused because it is recognizable, and they have to dispose it after the use. Currently, the company does not draw up a Corporate Social Responsibility (CSR) report but is interested in doing it in the future. The company could use it to communicate corporate welfare, for example that they want to expand the breakroom for the employee's well-being, their future

sustainable activities and traceability. This would allow to attract clients and help to keep existing clients who care about sustainability.

3.3 Analysis of the case studies using sustainability indicators

From the answers to the qualitative interviews, it is clear that the four case studies analysed are in some way interested in sustainability. The companies are small-medium enterprises with a strong tradition linked to the territory and to the "made in Italy", and for this reason every sustainable activity that they put in place is an innovation, because it means to introduce a new concept inside of their business strategy.

As said before, some aspects of sustainability are not at all easy to measure, therefore, it is important to identify some indicators that produce measurable data to evaluate the level of sustainability of a company. In order to evaluate the current sustainable performances of the case studies, I have used the answers to the qualitative interviews to obtain the information needed and, following the Elkington theory of the Triple Bottom Line[157], I have divided the indicators into three main areas covering the three aspects of sustainable development: economic, social and environmental. The economic performance indicator is defined by company turnover and number of employees. The social indicators are:

- working conditions, which include worker safety during working hours and well-being at work;
- transparency towards stakeholders, evaluated through the available information on the website and through the level of information sharing;
- bond with the territory, that is the Made in Italy production, the belonging to districts and relationships with other companies or public/private entities.

The environmental indicators are:

[157] Elkington J., *Cannibals with Forks. Triple Bottom Line of 21st Century Business,* Capstone Ltd*.,* 1997.

- use of non-chemicals in the production process, for example water-based glues;
- level of conformity to environmental standards and certifications, both of the company and of their suppliers;
- innovation of materials, including the use of certified leather or non-animal raw materials.

Each company is analysed using cartesian column diagrams divided by areas and showing the score assigned to the level of each indicator on the y-axis, and the type of indicator on the x-axis. The score ranges from 0 to 10, where 0 indicates “very bad” and 10 indicates “excellent”. Company turnover and number of employees, used as economic indicator, are not represented in a graph but indicated. The main purpose of this analysis is to provide a comprehensive and measurable architecture of the case studies analysed, in order to understand how traceability can be involved in sustainable development and how it could be useful in the future, both from an economic and an environmental aspect.

Gianfort S.r.l.

- Economic performance indicator: company turnover of € 1,5 million, the smallest of analysed companies. It has 20 employees and can be defined as a small enterprise;[158]
- Social indicators:

[158] As defined by European Commission in the Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises. A small enterprise has less than 50 employees and a turnover of € 10 million or less.

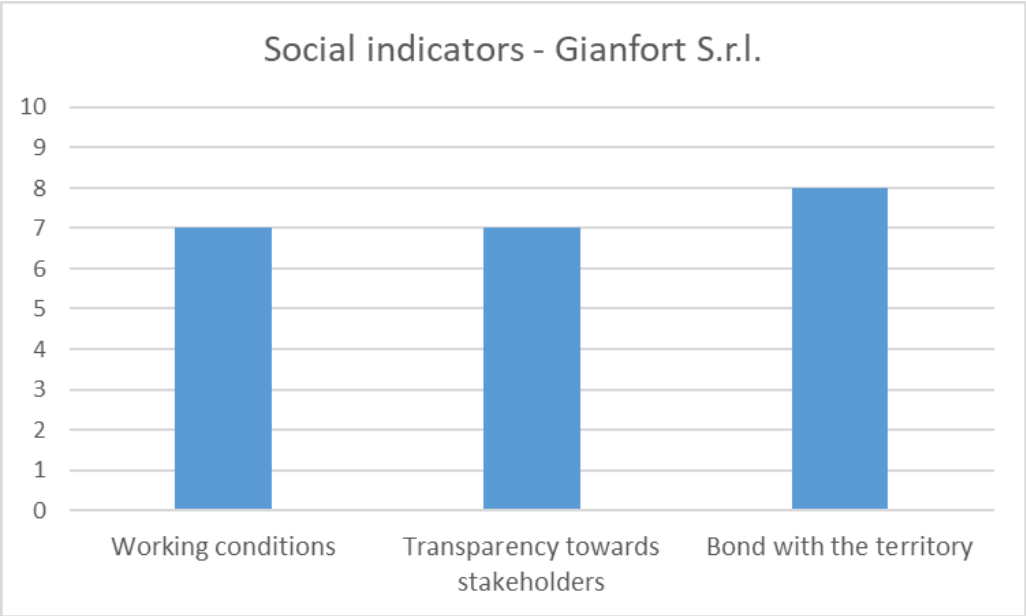

Figure 21: Gianfort S.r.l. - Social indicators. Source: personal elaboration.

The score assigned to the indicator *working conditions* depends on the fact that the company pays attention to the workers' health, for example using water-based glues and working mostly with seams, and it promotes gender equality and right working hours. The indicator *transparency towards stakeholders* has a score of 7 because the website[159] gives a lot of information about certifications and the writing reported on the shoes. The list of suppliers is not public. The bond with the territory is high because they are in the middle of two important footwear districts, their products are made in Italy and they collaborate with universities and public entities;

- Environmental indicators:

[159] For further information about certifications: https://www.gianfort.it/note-informative-gianfort/certificazioni.html

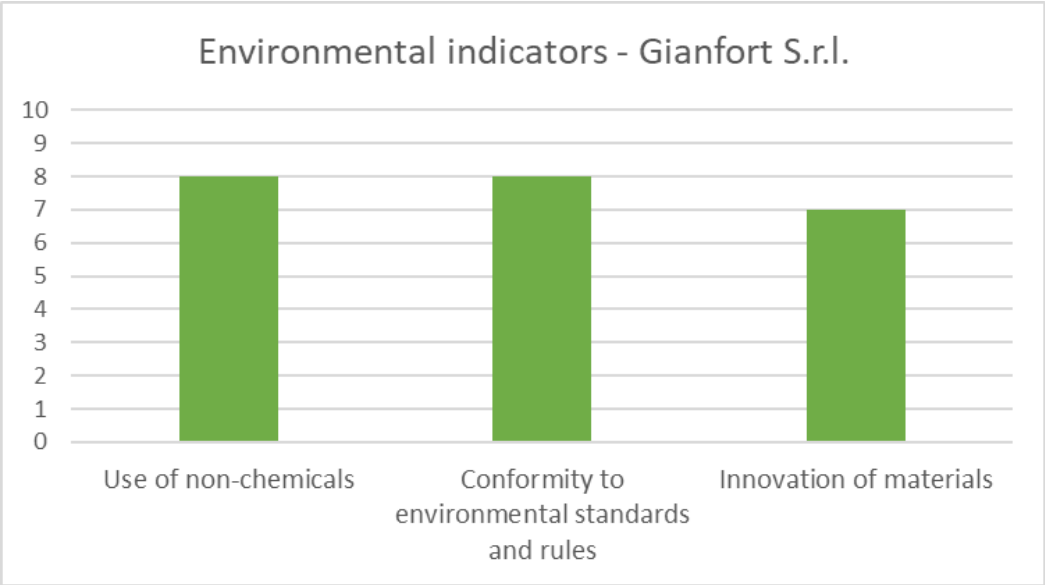

Figure 22: Gianfort S.r.l. - Environmental indicators. Source: personal elaboration.

The scores assigned to the environmental indicators are high because the company uses water glues, it is certified Bureau Veritas, ISO 14001 and Ecolabel and their raw materials are supplied by 100% sustainable companies which conform to standards. The machineries are still old, even if they have in project to renew them.

Voltan 1898

- Economic performance indicator: company turnover of € 4,5 million, among the biggest of analysed companies. It has 42 employees and can be defined as a small enterprise;[160]
- Social indicators:

[160] As defined by European Commission in the Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises. A small enterprise has less than 50 employees and a turnover of € 10 million or less.

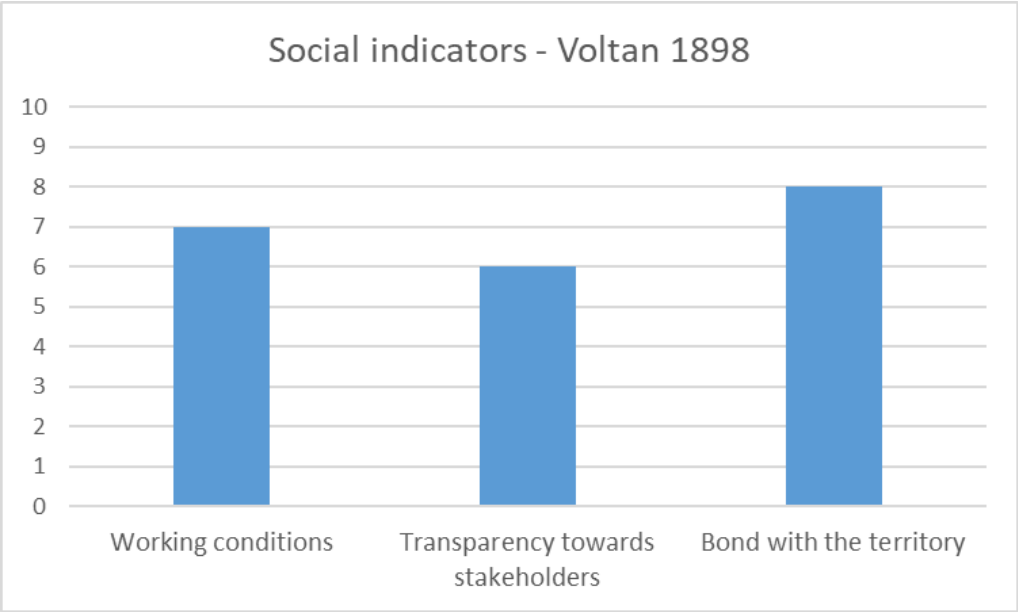

Figure 23: Voltan 1898 - Social indicators. Source: personal elaboration.

The *working conditions* indicator has a high score because the company pays attention to safety and health of workers, for example through the limits to the use of chemicals and the optimization of processes. The *transparency towards stakeholders* indicator has a score of 6 because in their website[161] they don't provide traceability of materials and processes, and in their website dedicated to the brand Alexandra Voltan[162] they only give information about the materials used. The list of suppliers is not public. The bond with the territory is high because the company is the oldest firm in the Riviera del Brenta district of footwear manufacturing and because products are made in Italy;

- Environmental indicators:

[161] Link to the website: https://voltan1898.com/
[162] Link to the website: https://www.alexandravoltan.it/

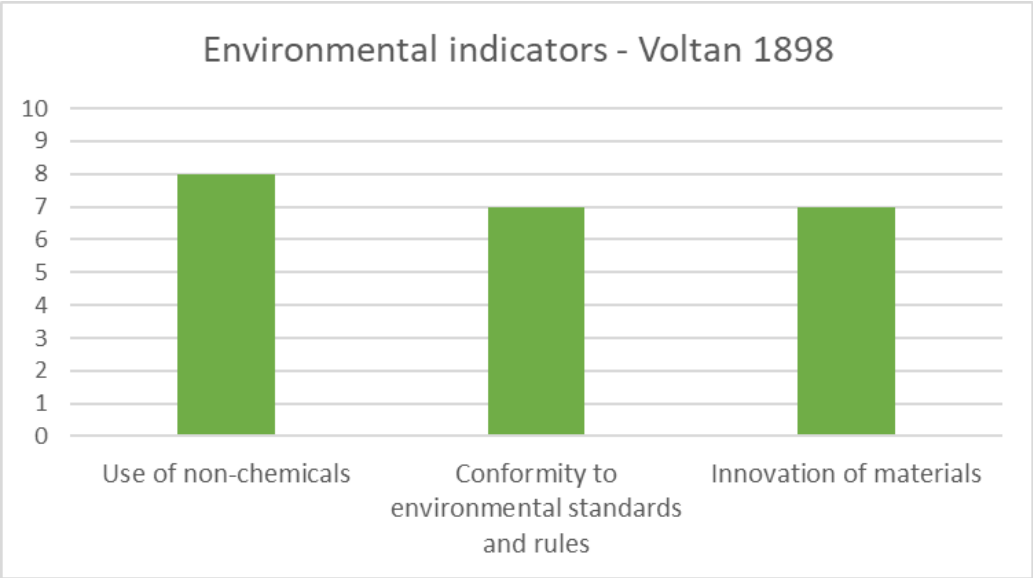

Figure 24: Voltan 1898 - Environmental indicators. Source: personal elaboration.

The *use of non-chemicals* indicator has a score of 8 because they use water glue. The *conformity to environmental standards and rules* indicator has a score of 7 because the company does not conform to international certifications, but pays a strong attention towards environmental sustainability in the production process: for example, their headquarters are powered by a photovoltaic system. The *innovation of materials* indicator has a score of 7 because their suppliers are certified, and all raw materials and components come from Italy.

<u>Calzaturificio Bellò</u>

- Economic performance indicator: company turnover of € 2 million. It has 15 employees and can be defined as a small enterprise;[163]
- Social indicators:

[163] As defined by European Commission in the Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises. A small enterprise has less than 50 employees and a turnover of € 10 million or less.

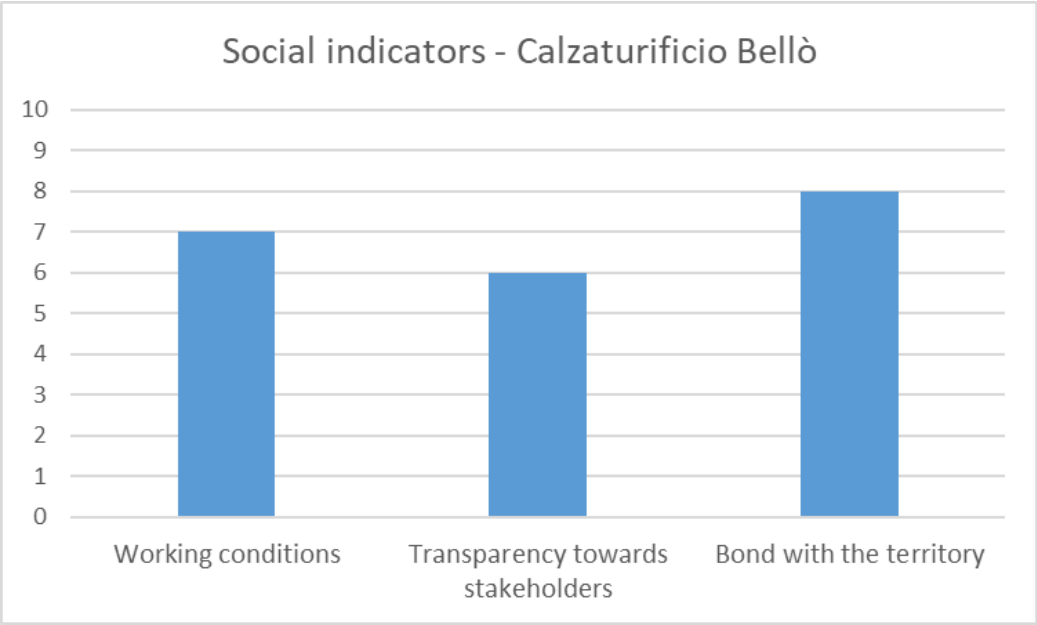

Figure 25: Calzaturificio Bellò - Social indicators. Source: personal elaboration.

The *working conditions* indicator has a score of 7 because the company pays attention to safety and health of workers, for example granting right working hours and safety conditions at work. The *transparency towards stakeholders* indicator has a score of 6 because in their website they don't provide traceability of materials and production, even if they give a description of products. The list of suppliers is not public. The bond with the territory is high because the company belongs to the Riviera del Brenta district of footwear manufacturing, it collaborates with other entities from the territory and has relationships with trade associations;

- Environmental indicators:

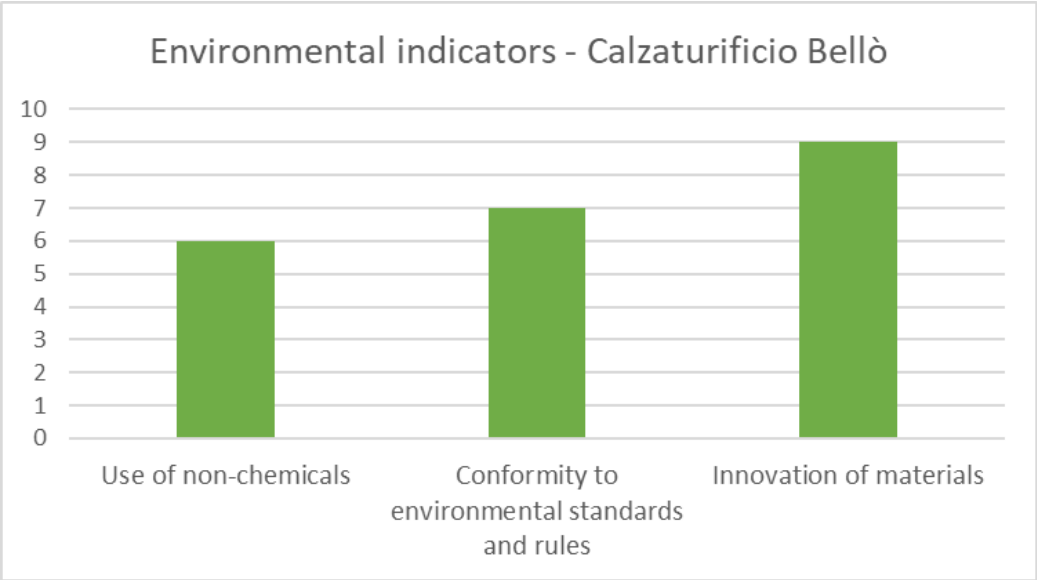

Figure 26: Calzaturificio Bellò - Environmental indicators. Source: personal elaboration.

The *use of non-chemicals* indicator has a score of 6 because they use water glue for the production of vegan shoes, while for the other shoes they use the traditional chemical glue. The *conformity to environmental standards and rules* indicator has a score of 7 because they are certified for the production of organic shoes and they promote circularity starting from product design. The *innovation of materials* indicator has gained the score of 9 because the company is able to produce vegetarian, vegan and organic shoes, which requires a strong attitude towards innovation.

Stivali S.r.l.

- Economic performance indicator: company turnover of € 15 million, the biggest of analysed companies. It has 60 employees and can be defined as a medium-sized enterprise;[164]
- Social indicators:

[164] As defined by European Commission in the Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises. A medium-sized enterprise has more than 50 employees but less than 250, and a turnover greater than € 10 million but less than € 50 million.

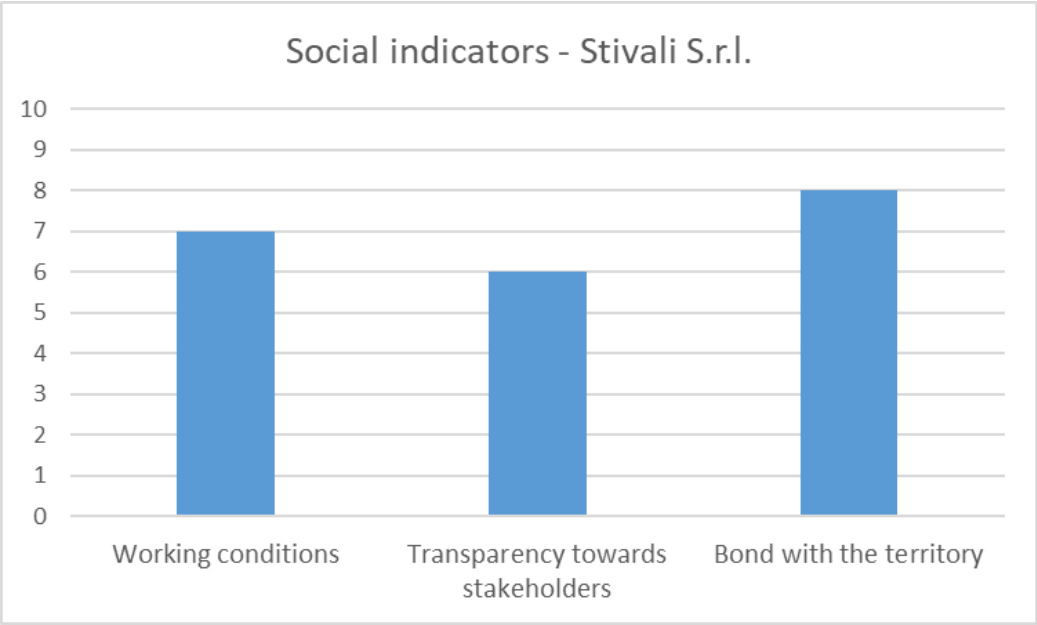

Figure 27: Stivali S.r.l. - Social indicators. Source: personal elaboration.

The *working conditions* indicator has a high score because the company pays attention to safety and health of workers and they promote internal training and gender equality. Furthermore, they are also subject to external audits for Corporate Social Responsibility required by the SA8000 ethical certification because they must respect the standard in order to work for Kering[165], even if they are not directly certified. *Transparency towards stakeholders* has a score of 6 because they need to communicate more technical information about traceability of materials and production in Stivaleria Cavallin's website. The list of suppliers is not public. The bond with the territory is high because the company belongs to the Riviera del Brenta district of footwear manufacturing, it has relationships with trade associations and donates to non-profit entities;

- Environmental indicators:

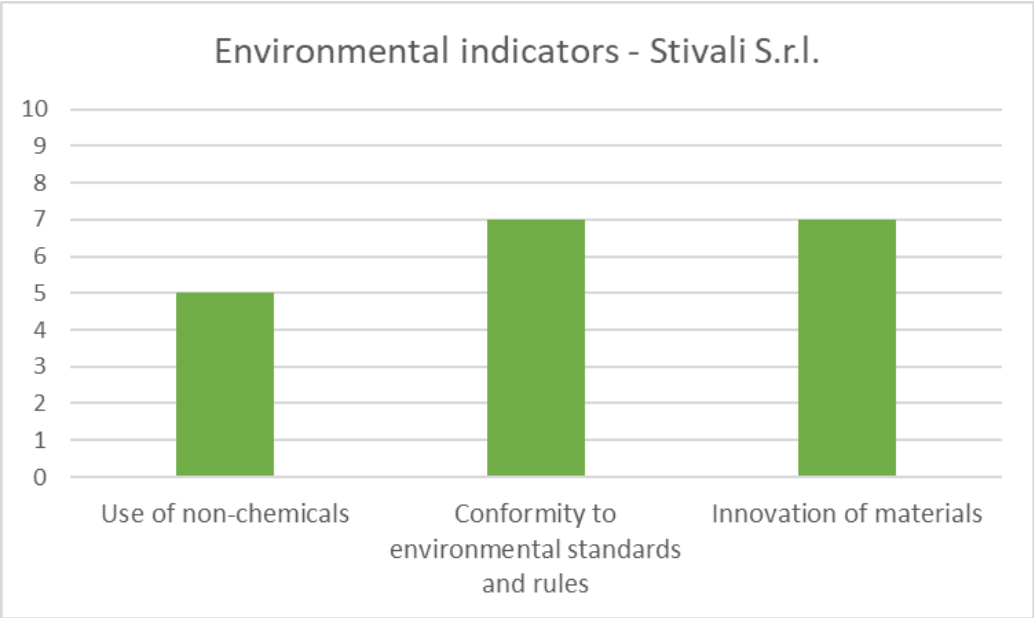

Figure 28: Stivali S.r.l. - Environmental indicators. Source: personal elaboration

The *use of non-chemicals* indicator has a low score because they did not substitute the chemical glue with the water-based glue, even if they plan to do it in the next 12 months. The conformity to environmental standards and rules is high because they work for Kering[165], which requires its suppliers to sign their Ethic Code and their Sustainability Principles, even if the company does not conform to any international standard. The *innovation of materials* indicator has a score of 7 because for their products they use high-quality materials controlled by artisans, and for contractors' products they receive certified raw materials from external suppliers.

3.4 Final observations

Based on the areas of analysis, I averaged the scores obtained from the indicators of social and environmental sustainability, in order to represent a summary of the current

[165] Kering S.p.A. is a group in the luxury sector based in Paris. It owns luxury brands, including Gucci, Saint Laurent, Balenciaga, Alexander McQueen, Bottega Veneta, Boucheron, Brioni, Pomellato. In January 2018, during the world economy forum in Davos, Kering was named the most sustainable of the textile, clothing and luxury goods companies in the Corporate Knights Global 100 index. Source: https://www.kering.com/en/group/

commitment in terms of sustainability. A histogram is used to visually compare sustainability performances of the case studies, where social performance is the average of the scores obtained in working conditions, transparency towards stakeholders and bond with the territory; while environmental performance is the average of the scores obtained in use of non-chemicals, conformity to environmental standards and rules and innovation of materials (figure 29). Economic performance is not represented, because it was not possible to assign a score without comparing companies' turnover.

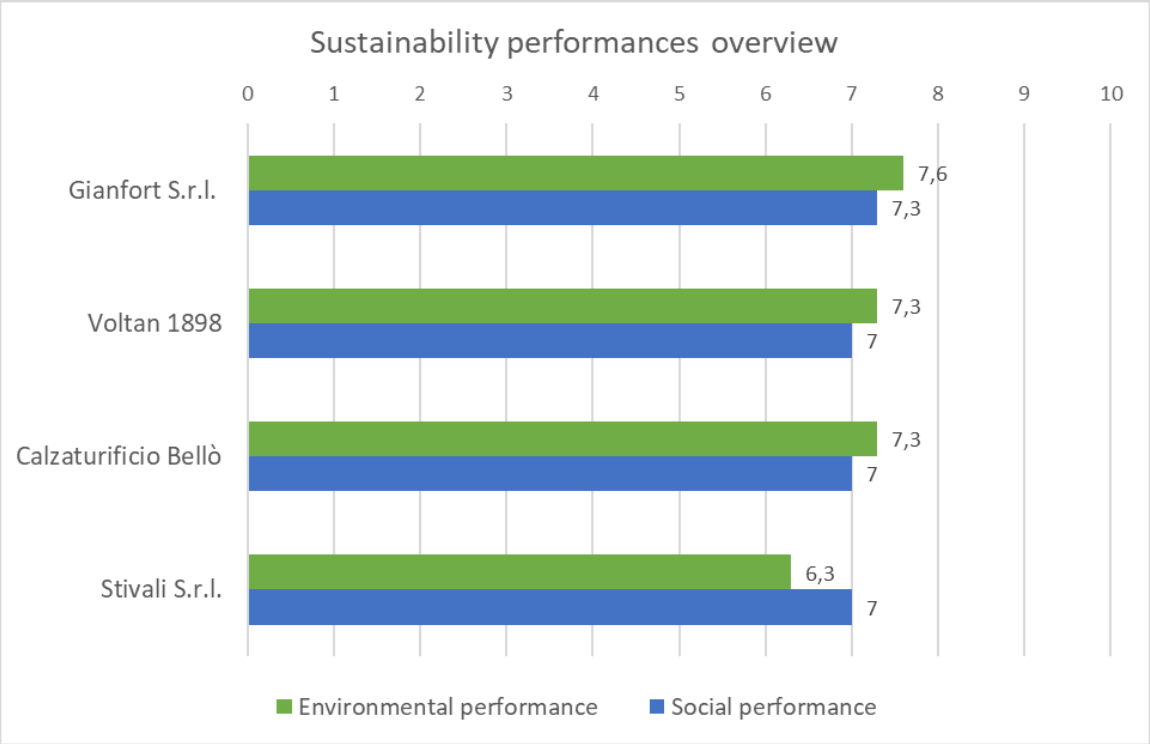

Figure 29: Sustainability performances of the case studies. Source: personal elaboration.

This graph is used to explain how traceability can play its role in in achieving sustainability goals, while being efficient in processes. There are companies that are making a strong effort to integrate sustainability within their strategy, while others have simply conformed to rules when needed because the market and the stakeholders were asking for it. What emerge is that companies perform almost at the same level regarding social indicators, while Gianfort S.r.l. obtained the highest score in the environmental performance, due to certifications and sustainable suppliers. Voltan 1898 and

Calzaturificio Bellò obtained the same high score, the first because pays a strong attention on environmental impacts during the production process, and the second because of its innovative production of vegan and organic shoes. Despite working for Kering, Stivali S.r.l. obtained the lowest score because it needs to improve its own activity related to environment, for example they could exploit the fact of being subjected to external audits to obtain their own certification or reduce emissions. Starting from this current situation, as said before, every company is working on future sustainability projects with the research laboratory "Tracciabilità per la sostenibilità: valore economico e design" because they want to make sustainable strategy plans for the future. Traceability is one of the means by which companies can map their processes and understand where and how they can put future projects into practice, in order to obtain economic, social and environmental advantages. Three main topics about future projects were addressed: the possibility to insert a smart label in the shoes, the problem of leather scraps and the importance of drawing up and sharing a CSR report. These measures have different purposes: the communication to the final consumer to improve firms' reputation, efficiency of processes, costs reduction, the need to conform to standards and rules, or simply a particular attention towards sustainability.

What all the companies analysed have in common is the need of a CSR report, because it is essential in order to communicate to internal and external stakeholders what is the commitment of the firm in terms of sustainability, to generate trust improving the reputation and to keep track of environmental and social impacts. The company most interested in a CSR report was Gianfort S.r.l., because it already has many sustainability-related activities to communicate. Even what seems to be a small contribution is important, and if it is not communicated then the full advantages can't be exploited. An example of how every company can give its contribution in achieving the 2030 Agenda Sustainable Development Goals and tell it to its stakeholders is the Italian firm Monnalisa S.p.A., presented in the previous chapter. The companies' approach must therefore necessarily be oriented to share with the stakeholders: any form of reporting on sustainability of the production activity is desirable and valuable, in line with the 12.6 Agenda 2030 target which "requires Member States to encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate

sustainability information into their reporting cycle".[166] Another way to communicate contents to stakeholders is a smart label with a QR code to get access to some information about products. It can be used both for internal traceability of shoes, and for external communication of digital contents. From the interviews what emerged is that, considering the four case studies, companies with a very active social profile and with a proprietary brand that has a strong reputation among customers (Voltan 1898 and Stivali S.r.l.) are the most interested in creating a smart label. One problem that three companies out of four have is that of the disposal of waste, in particular of leather scraps. Traceability of waste can help to identify the costs deriving from the disposal, and then to improve the process in order to reduce them. Currently, the companies analysed do not differentiate the waste deriving from the materials used in the production process, and dispose everything through external organizations, generating costs. A way to solve this problem is recycling, to fully exploit the life cycle of high-quality materials as, for example, in the case of Patagonia, Inc., presented in the previous chapter. There are two options: recycle internally, using the leather scraps to produce other shoes within the company, or recycle externally, differentiating waste and giving them to other organizations. The first option is complicated to put in practice, because it requires a precise expertise and it could be costly, but on the other side it would allow the company to save money that they now use for new materials, using recycled ones and creating dedicated collections to promote sustainability. The second option is simpler because other organizations can recycle materials externally, but it could be less engaging to communicate. From the interviews what emerge is that, considering the four case studies, the three companies that currently pay more attention to sustainability (Gianfort S.r.l., Voltan 1898 and Calzaturificio Bellò) are the most interested in starting a process of recycling of waste.

Preparing a CSR report, using a smart label with a QR code and thinking about recycling leather scraps are some examples of how traceability can contribute to gain sustainability in the fashion industry. These three measures allow the company to obtain advantages from different point of views:

[166] Global Reporting, https://www.globalreporting.org/information/SDGs/Pages/SDG-target-12.6-.aspx

- The CSR report is a representation of the activities regarding ethics and environment, in order to be transparent with stakeholders and gain their trust. It is important to keep track of past and present impacts on society, people and environment and to communicate the future commitment;
- A smart label is a mean of traceability because it gives information, through the QR code, about the origins, the materials used and the production process of company's products. It can be used internally, to share technical information with workers and suppliers, and externally, to communicate engaging contents to customers;
- Recycling waste means reducing disposal costs and giving new life to materials at the end of their life cycle, giving both an economic and environmental benefit. Traceability is a pre-condition to this option, because allows to check quantities and types in order to understand its feasibility.

In conclusion, the choice of a sustainable production and a commitment for transparency must be understood not only as a cost for the company, but above all as an investment that guarantees a more solid and more durable positioning in the market. Istat gives testimony to the value of sustainable production by estimating, at national level, significant productivity differences for Italian companies with a medium-high level of sustainability, compared to units with no sustainability.[167] For small and medium-sized enterprises it is easier to implement traceability because they do not have problems linked to the certification and control of high volumes of products and suppliers. In addition, they can gain advantage because multinational enterprises require their small suppliers to be aligned with stringent sustainability standards and the utilization of recognised traceability systems can attract important clients who need to conform with environmental and ethical rules. On the other side, the challenges for small and medium-sized enterprises are the costs to face and the need for resources linked to the implementation of traceability.[168]

[167] Veneto Region, *Rapporto statistico 2019. Equilibrio*, 2019. For further information: http://statistica.regione.veneto.it/Pubblicazioni/RapportoStatistico2019/index.html
[168] United Nations Global Compact, BSR, *A Guide to Traceability: A Practical Approach to Advance Sustainability in Global Supply Chains*, 2014, p. 30.

Conclusions

Sustainability is no longer a choice but a necessary objective for companies, not only because of problems related to the environment, but also because of stakeholders who are asking for responsible behaviours. This is particularly true for the fashion industry, affected by social and ethical scandals and cause of pollution and damages to the environment. Fashion supply chains have become fragmented and complex because of the continuous research for competitive advantage, but as complexity grows, monitoring and identifying accountability for environmental and social damages becomes more difficult. The thesis demonstrated that traceability is the starting point for fashion companies to solve these problems. It covers the three aspects of Elkington's Triple Bottom line theory: profit, people and planet. What emerged from literature is that traceability:

- is a tool for internal efficiency, because grants a more efficient resource management and reputational risk management, being a key catalyst of the change from a linear to a circular system in the fashion industry. In this sense it allows companies to understand their social and environmental impacts in order to improve and control their supply chain, and it is considered an evidence of good business practises linked to innovation;
- is a tool for external transparency, because it allows to share information with stakeholders in order to gain their trust. On one side, enhancing communication with business partners attracts new clients and improves relationships with suppliers, while sharing information with consumers improves the reputation and increases profit. On the other side, being transparent obliges companies to be sustainable, in order to avoid reputational risks.

These considerations were supported providing four concrete examples of fashion companies interested in sustainability and willing to use traceability systems to facilitate its integration in the corporate strategy. An example of traceability as a tool for internal efficiency is the possibility to track waste coming from unused leather and recycle them according to the circular economy model suggested by the Ellen Macarthur Foundation. The amount of waste is a common problem for the case studies analysed, and this

solution would allow to save disposal costs and reduce pollution. An example of traceability as a tool for external transparency is a smart label, which allows to communicate contents to the final consumer by using a QR code, and the Corporate Social Responsibility report, which must be public in order to be transparent and improve company's reputation. Both these measures can be considered a form of traceability because the first allows to track products along the supply chain, while the second keeps track of activities allowing to measure impacts and document sustainability. Companies often engage in responsible behaviours but without properly communicating it externally, and this constitutes a loss of advantages deriving from being transparent.

These case studies offer only a small example of how traceability can be used to identify economic, social and environmental impacts and consequently improve in order to limit them. There are infinite possibilities of gain from the use of traceability in the fashion sector, while being aware of the risks and costs that this entails. It requires resources and a careful evaluation, but most of all it needs to be a multi-stakeholder initiative because, in such a complex industry, collaboration is essential. In the last years there has been a growing number of fashion companies integrating traceability systems in their strategies, in particular using technologies innovations. At the same time, consumer's interest towards sustainability has increased, and with it the need for transparency. What emerged is that there is the need for a radical change that involves all stakeholders, from companies to governments, but also final consumers.

Fashion supply chains were designed to be opaque and until now the problem of corporate responsibility related to the environment and people had not arisen. Traceability and transparency are disruptive in this sense. They serve to stakeholders to choose and buy in a more conscious way, but also to the company to be aware of its impacts. It is impossible for companies to ensure the respect of human rights and reduce the environmental damage if they don't know their supply chain. At an industry level, there is the need for a common approach and a standardized measurement or certification, in order to make it easier to collaborate among stakeholders. Governments should impose stricter regulations regarding sustainability and promote circular economy, while companies should invest more in innovation and technologies in order

to move towards a real change. I believe that in the future traceability will be an essential element for fashion firms to face the problem of an unsustainable industry, which all companies will be called upon to solve.

Appendix

Email interview with Guido Cappelli, Certifications and Operations manager for Monnalisa.

The following questions and answers were made in Italian and then translated in English.

1. What were the reasons that led you to invest in traceability?
   The main reasons for investing in traceability are the control of the grey market and the improvement of the customer experience.

2. Do you use the RFID technology as a mean of traceability?
   For about 3 years we have used RFID technology oriented to the points mentioned above as well as for the purpose of making logistics processes more efficient. The technology is momentarily suspended.

3. Do you use other supply chain traceability systems?
   All the products are traced with QR code technology, which is more effective from a market control point of view, guarantees the same level of traceability and has much lower costs than the RFID tag. In 2020 we will choose which of the two technologies indicated above will be used for the entire 2021 production.

4. What are the benefits provided by supply chain traceability?
   The customer who buys Monnalisa takes it for granted that the product has a controlled supply chain, so if you ask me if, for the moment, we have found benefits regarding sales I would say no. Probably with the change of generations (about 5 years) we would have the "obligation" to report all the information to the final consumer.

5. Do you have future plans regarding sustainability?
   We are working on "green" product lines and studying for the recycling of fabric waste generated during the cutting phases. It will be natural to associate the

RFID tag or the QR code technology to ensure traceability of "green" products and thus be able to inform the consumer transparently.

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