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SOCIAL SUSTAINABILITY WITHIN THE SUPPLY CHAIN: THE CASE OF MANIFATTURE SIGARO TOSCANO

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1 Introduction

According to a survey by the World Economic Forum, in the next ten years the most serious threats will come from the environmental and social spheres and will mainly affect companies with significant supply chain activity. ("5 challenges facing global supply chains," 2022). The case of MANIFATTURE SIGARO TOSCANO is particular and fascinating because, as the company with the highest level of cigar sales and production, it plays a crucial role in achieving full corporate sustainability.

Among the various challenges facing the company, the most imminent one is related to legislative compliance, linked to the concept of sustainability. It is therefore necessary to move from 'one-off' sustainability policies to the adoption of an integrated sustainability strategy that involves the entire corporate organisation and its strategic choices. Starting from the Triple Bottom Line concept and analysing ESG factors, especially the social one, we will look at how the tobacco supply chain is evolving and adapting to legislation.

The aim of this thesis is to investigate the increasingly unique role of all corporate components along the supply chain, the way the company treats people (e.g. human capital management, diversity and equal opportunities, working conditions, health and safety and mis-selling of products) by developing theory on understanding different approaches to corporate rights, but also to understand how new technologies work, the role they play for the company and the symbiosis with employees.

In order to justify and demonstrate how the company is making itself sustainable, a general strategy for considering social sustainability measures is proposed and some social sustainability criteria obtained through interviews with company decision makers are reported. Some of these criteria are then used to demonstrate how, through the BWM method, they can be applied to corporate supply chain decision-making.

The following thesis work will initially introduce the topics of Supply Chain, Supply Chain Management and Social Sustainability, analysing the concepts and preparing the reader for their development in the social sphere. The first chapter will be followed by the chapter in which the Triple Bottom Line concept will be analysed. The fourth chapter will then deal with the implications of sustainability in corporate governance and, in this context, will introduce the concept of Corporate Social Responsibility and how European legislation is moving towards bringing social sustainability into the world of work.

The fifth chapter will aim to collect data on an analysis process to find the best social sustainability criteria within the company MANIFATTURE SIGARO TOSCANO and will give the experimental character to the thesis by providing solutions from the measurement of social sustainability using the BWM method. Finally, the last chapter will draw conclusions and highlight the limitations of the work, suggesting directions for future research.

This work not only contributes to the growing literature on social SSCM, but in a more important contribution it attempts to identify a fair way of examining the social indicators that a company must consider in order to be considered socially sustainable. This research is very useful for supply chain managers and policy makers to understand different models of social sustainability and, in turn, can serve as a key tool for sustainability decision-making.

1.1 Research Question (RQ):

- How is the supply chain of the leading Italian cigar manufacturer evolving from the perspective of social sustainability?
- How is labour law along the MST supply chain evolving and adapting in light of the incorporation of sustainability practices?
- What is the relationship between new technologies and employees' work?
- What are the criteria for achieving social sustainability?
- How can social research in the manufacturing sector be integrated with the dominant conceptualisations of SSCM and what are the drivers, enablers and barriers for the implementation of social risk management practices?

2 Literature Review

The following research work is structured as an analysis of the literature on social sustainability in the corporate sector and in the supply chain sector. A basic knowledge of the fundamental concepts in the supply chain context will be provided, as well as an overview of the main sustainability issues applied to the corporate context. This initial part will be preliminary to the drafting of the Manifatture Sigaro Toscano case analysis topic, i.e., theories and managerial strategies aimed at making the supply chain coherent within the framework of social sustainable development.

Over the last decade, many studies have been conducted on sustainability in supply chain management. However, social aspects are still neglected in the discussion (Köksal et al., 2017). The main motivation of this literature review is to investigate the supply chain and the sustainable practices that are involved in it with the definition of some conceptual frameworks that are very important for further work. Initially, it is necessary to refer to and report on what is the world literature and case studies that have been covered in recent years regarding the social sustainability of a company.

2.1 Methodology

Papers and articles related to the topic were searched through the scientific search engine Scopus; reference is made to a previous academic article that analysed the literature of social sustainability: 'Social Sustainable Supply Chain Management in the Textile and Apparel Industry-A Literature Review'.

The authors conduct the content analysis covering 45 articles published in peer-reviewed English journals, and propose a comprehensive map incorporating the latest findings on socially related practices in the textile/apparel industry (Köksal et al., 2017), but the use we will draw from it for our thesis project will be mainly for the 'manufacturing' issue, leaving out the specific type. The results, which show a continued lack of investigation into the social dimension of the Triple Bottom Line in Sustainable Supply Chain Management, open up interesting research questions. The important result of this research is the identification and definition of many social dimensions related to the Italian manufacturing supply chain.

Documents were searched for the keywords needed for the development of Chapter 3 Sustainable Supply Chain Management. The filters and keywords used for the search were: "supply chain", "SCM", "supply network" and "Social Sustainability""social sustainability in manufacturing". For these first two chapters, the notions learnt during the Sustainable Supply Chain course held by Professor David B. Grant during the first semester of the second year of the master's degree course at the Hanken School of Economics in Helsinki were also analysed, and of further help and inspiration was The Journal of Supply Chain Management.
For the preparation of the chapter on sustainability, 'green' or 'sustainability' or 'sustainable' were typed. Finally, for the development of the chapter on sustainable practices and the GSCM, the latter terms were combined with terms from the supply chain field, such as "supply chain" or "manufacturing" or "logistics"

Specifically, the most searched formulas were: green supply chain management, sustainable supply chain, triple bottom line and supplier sustainability In order to sort and select the material useful for the thesis, a quick reading of the title and abstract was necessary. This step was useful to exclude superfluous material that was not consistent with the topic under examination.

Regarding to the specific part of analysis and experimentation on the Manifatture Sigaro Toscano company, company documents found online on the company's website were analysed and made visible to all customers and interested parties. Of particular interest was the analysis of the annual Sustainability Reports, in which it was possible to identify the actions that the company implements to increase sustainable practices in each area of the Triple Bottom Line and some quantitative data on the sustainable performance achieved.

3 Sustainability

The word sustainability is a broad and generic term that touches hundreds of fields from the economic to the environmental and social and with it branches out into hundreds of other subsets extending even in time, just think of intergenerational sustainability that includes future generations. Although the word sustainability is a recent one, considering that it only began to spread and be included in vocabularies all over the world since the 1980s, it is destined to gain more and more importance.

The concept of sustainability was introduced during the first UN conference on the environment in 1972, but only two years later, during the Woodlands Conferences in Houston, Texas the word 'sustainability' for the first time appeared in the United States in the context of development. Thus implying for the first time issues such as social development, resource depletion, urbanisation and the deterioration of ecosystems (Kidd, 1992).

Today, sustainability is commonly associated with nature and the environment, but its economic and social aspects are often not discussed. (Tavanti and Wilp, 2021) As we have seen, the concept of sustainability has undergone an etymological evolution away from a vision centred on ecological aspects and towards a more global meaning, taking into account not only the environmental dimension but also the economic and social dimensions (“sostenibilità nell’Enciclopedia Treccani,” n.d.).

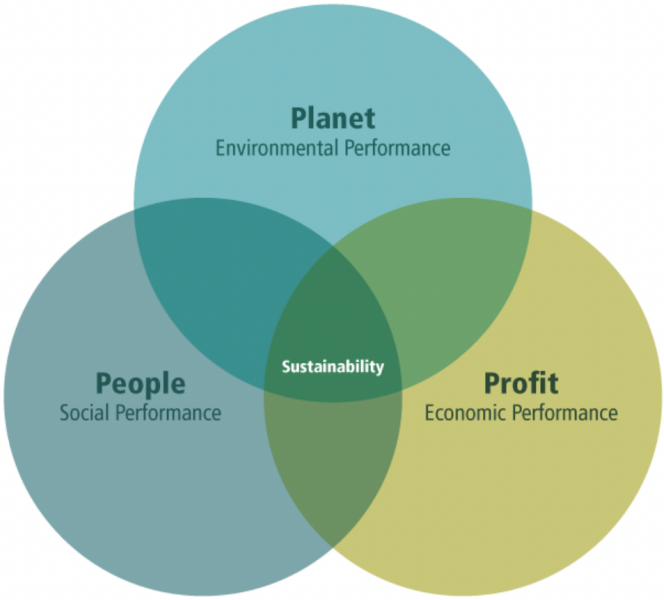


Figure 1. *The graph shows the wide, comprehensive range of sustainability and its possible declinations in the industrial sector*

Sustainability as an interdisciplinary concept was consecrated in 1987 by Gro Harlem Brundtland who drew up 'Our Common Future', a guideline for sustainable development that is still valid today. In the report, the theme of sustainability is linked to the three 'pillars' that make business development and environmental protection compatible:

- ***Environmental sustainability***: a process of change in which the natural resources used are not compromised in terms of availability, reproducibility and where man, in full harmony with nature, enhances the current and future potential of the ecosystem in order to meet the needs of future generations.
- ***Economic sustainability:*** the ability of an economic system to generate lasting growth in economic indicators, which are identified in labour and income.
- ***Social Sustainability:*** a general definition could be given, but as it is a central topic of the Thesis it will be analysed more specifically in the next section (Social Sustainability).

Thus, it is utopian to believe that a single definition of sustainability is universally accepted. This is not necessarily a bad thing if those who use the term take care to explicitly state what they mean by sustainability.

3.1Triple Bottom Line

The meeting of the three sustainable components ideally coincides with the 'sustainable development' constituted by what the British scholar Jhon Elkington called the Triple Bottom Line (1994).

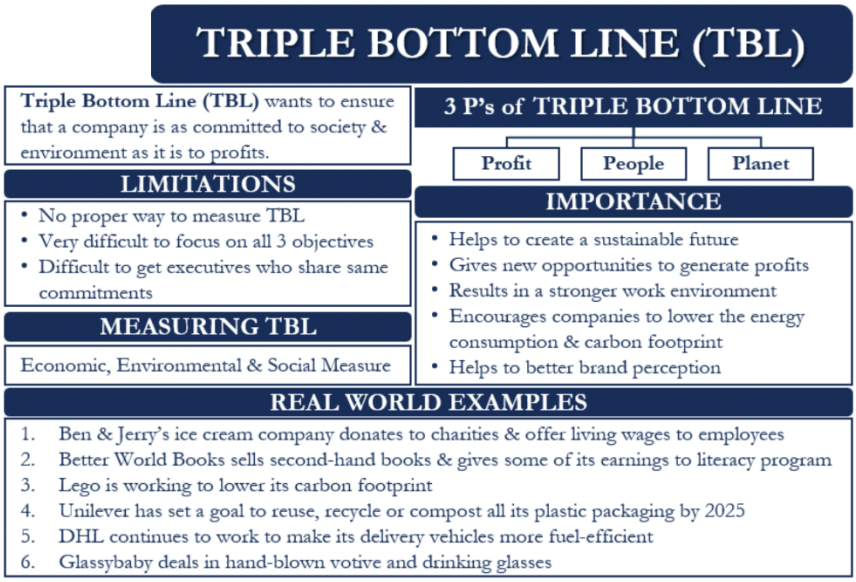


Figure 2. *Definition and real world example of the concept of triple bottom line.*

It is outlined as an accounting framework but differs from other reporting frameworks because not all of its elements, think of environmental and social, are easily measurable. Andrew Savitz gives a comprehensive definition of TBL: "it captures the essence of sustainability by measuring the impact of an organisation's activities on the world... including both its profitability and shareholder values and its social, human and environmental capital" (Savitz, 2013).

The Triple Bottom Line can be used as a reference point for projects of different scales and with action boundaries that may vary depending on the geographical area under consideration, we will focus on projects carried out by the manufacturing company and therefore the action boundary is considered small compared to that of a government acting on a national scale. The set of measures that will then be implemented to complete the project will be decided by the stakeholders who will evaluate the data needed to guide the development of a proper TBL (Slaper and Hall, 2011).

According to a study by the Indiana Business Research Center, the fundamental value of TBL has become increasingly central in the business world, companies and industries take into consideration some very important factors to increase the TBL score, in the area of our interest, the social one we find:

- Average hours of training/employee
- From welfare to career retention

What we are going to do is precisely to outline and clarify a field of study for our thesis. In this transition to the social environment, our focus is on how companies pursue this type of sustainability.

3.2 Social Sustainability

The social dimension is commonly recognised as the 'weakest' pillar of sustainable development due to a lack of analytical and theoretical foundations (Lehtonen, 2004) and the state of development of indicators or measurements of corporate social sustainability is believed to parallel that of environmental performance some 20 years ago (Ranganathan, 1998).

The definition and objectives of social sustainability, as well as the related indicators, are a rather complex topic to illustrate and to which much attention has been paid: a) because of the multi-level, multi-stakeholder and multifaceted nature of the issues addressed, b) because of the interaction with environmental, economic and institutional aspects and, finally, c) because of the precariousness of the models to be used as a reference. (Fantini et al., 2013).For this reason, in the thesis work, an attempt will also be made to extrapolate from the results of the empirical study a sectoral definition of social sustainability that departs from a broader and more generic view of society as a whole.

Littig and Griessler defined social sustainability in relation to work and lifestyle as: 'the freedom to choose, at any stage of life, between different forms of work (mode of work, field of work) or lifestyles, always having the right to autonomy and freedom of choice of work, field of work) or lifestyles, while always having the right to individual social security'. In other words, underlying the definition is an ethical and moral aspect concerning the uniform distribution and provision of opportunities that do not vary according to type of work, social, ethnic or religious background.

As already mentioned, the diversity among employees in the manufacturing industry is lower than in society as a whole (Berlin et al., 2013), but when analysing cases, it is also fair to look at other companies to see how they apply models and solutions to change social sustainability outcomes. An example of what is meant by social sustainability can be found within the short week experiment carried out by some in the UK:

Over the past five years, the four-day week has had an incredible journey, moving from the margins to the mainstream. This fundamental shift is primarily due to the success of pilot projects around the world, the changes in society post Covid-19 pandemic, the work of the press, social media, groups such as the Four-Day Week Campaign, the coming together of various trade unions, and most importantly the work of politicians across the UK party system who have supported the policy in the national debating chambers, a mixture of actors who have pulled in the same direction in order to experiment and implement an example of change and as we shall see, business improvement.

The experiment conducted sampled 61 companies, of which 56 have so far decided to continue the short week experiment (92%) and as many as 18 have decided to confirm this change permanently. Data from interviews, surveys and company administrative data were collected at three different points in time: during the beginning, in the middle and at the end of the experiment (Lewis et al., 2023). It is interesting to consider this case because it is one of the few implemented and successful large-scale experiments of what could be an improvement not only from a labour and production point of view, but also from the point of view of corporate social sustainability, a topic close to our hearts.

First of all, the report presents the methodology used to collect data throughout the research, then it goes on to introduce the sample companies considered and the type of employees (male, female, other). Moving on to the analysis of key business performance metrics that are identified in turnover and staff turnover and also employee data, including health, well-being and work-life balance. Companies decided to implement different short-week models, but in the end the result was the same, i.e. to remove eight working hours, regardless of whether earlier in the week or later in the year. Some companies could decide to stop the experiment at a certain point in time in order to meet important targets. Of course, the experiment, if it were to be tested in Italy, would notice certain modifications that would be necessary depending on the type of company and the number of employees in that company.

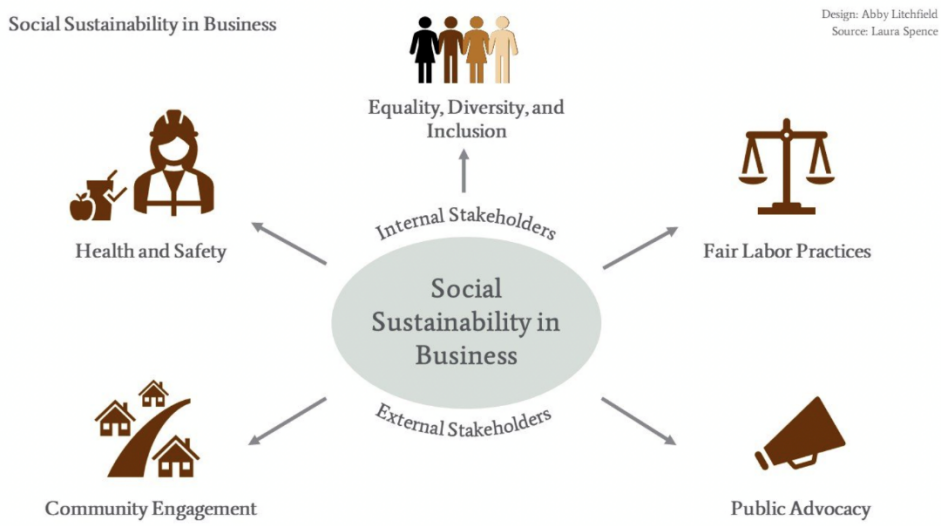


Figure 3. *Schematic diagram of the of the flow of information within the company related to the concept of social sustainability*

It is important to say that the experiment took place at the time of the Great Resignation, and therefore some data such as the number of resignations turned out to be even more interesting, and the data coming out confirms this: "*In fact, resignations per found a decrease from 2 to 0.8 between the comparison period and the experimental period (57%). This suggests that the four-day week helped reduce resignations from these organisations; there was also a drop in new hires, from 3.4 per 100 employees to 2.4 (37%); as well as a reduction in sick days of 67%. On a scale of 1 to 5 from 'never' to 'always', the frequency of work-related stress decreased on average from 3.07 before to 2.07 after. In the face of decreasing job stress and burnout, employees are more satisfied with their jobs, registering a significant average increase from 7.12 to 7.69 on a score of 0 to 10*" (Lewis et al., 2023).

Emotional, mental and physical well-being, fatigue and sleep also improved. Positive changes also occurred at the intersection of paid work and family/other parts of life. This is just one example of the optimisation of business processes that influence the proper development of social sustainability, and the real-life application of the experiment is a major success for companies, consider that a study in the United States found negative health and safety effects of overtime, long hours and shift work. The average hours worked by all family members increased by 11 percent between 1975 and 2005, and with the advent of computer monitoring of work processes and outcomes, performance pressure has increased (Rousseau, 2006), although this study has focused primarily on the U.S., approaches to managing the workforce that off-load risks and costs to employees seem to be spreading around the world as other countries seek to copy the market-like, deregulated approach to labour markets of the United States (Pfeffer, 2010).

These data reflect the unstable situation in the labour sector and, above all, are a direct response to an employee's loyalty to the company that decreases more and more with time, favouring instead temporary arrangements and dismissals. Company management practices such as dismissals, leave, paid holidays and

unsustainable working hours outline a real lack of autonomy of the employee over his work and can cause serious effects on his health and psyche. It is only right to begin to recognise that these working conditions are more widespread than one might think; identifying and correcting them can benefit the company, which would save on training and recruitment costs, for example.

There is strong and abundant evidence of the relationship between the establishment of a healthy work environment and the growth of company performance, a panel data study of 109 Italian manufacturing companies found that the adoption of high performance work modes led to better performance, by high performance (HPWPs) we mean total quality management, formal teamwork, job rotation and employee engagement programmes. (Colombo et al., 2007). The purpose of these high-performance activities is to offer higher flexibility and to motivate employees so as to increase participation in decision-making by significantly enhancing communication skills and problem-solving abilities.

The Great Place to Work Institute has been conducting and reporting on annual surveys to create a ranking of the 100 best companies to work for in America since 1998, the characteristics a company has to advance in this important ranking are to improve social sustainability by introducing activities that reduce both employee stress and the possibility of illness resulting from it. More specifically, what companies do, in addition to experimenting with examples of short weeks as we have seen, is to grant sabbaticals to employees to allow them to take a break from obsessive work, offer flexible working hours and equally sustainable ways of working such as teleworking. It is also important to train the employee to recognise what is the right way to work in a sustainable way, and therefore companies have invested in training both full-time and part-time employees. The emphasis placed on this has not only paid off with increased production numbers, but the companies' notoriety and reputation have attracted top talent that has increased the companies' capital stock.

Social sustainability is not just a sustainability façade, but a business choice that leads to quantifiable results. The mindset that sees only environmental sustainability as the focus of corporate development is misleading and archaic. It is not only nature's ecosystem that is being damaged by the practices of many companies, but people also face illness and premature death as a direct consequence of certain organisational behaviors. The time has come to take matters into our own hands and address the negative consequences of such attitudes by debating and implementing reforms as in Britain.

3.3 Supply Chain

The term supply chain nowadays is influenced by concepts such as globalisation, which inherently almost always include global economic scenarios, but supply chain activities permeate every aspect of our lives and therefore their ability to impact the natural and social environment is of considerable importance. The globalisation of business has meant that many products are no longer manufactured in domestic markets, but are outsourced and produced in less developed countries, particularly in Asia, and then shipped around the world (David B. Grant et al., 2017).

How does a domestic company ensure the sustainability of its global supply chain and keep an eye on potential social implications?

The concept of the supply chain should first be presented in a technical form to promote understanding of its management, in fact: to have meaningful theories of supply chain management, we must have a theory of the supply chain itself (Carter et al., 2015). Most supply chain definitions are based on the production route of a product from the raw material to the finished product. Thus, highlighting two substantial points: origin and destination. In between we find activities that add value depending on the good produced, but the supply chain extends in an integrated way to the information and financial flow. Benita M.

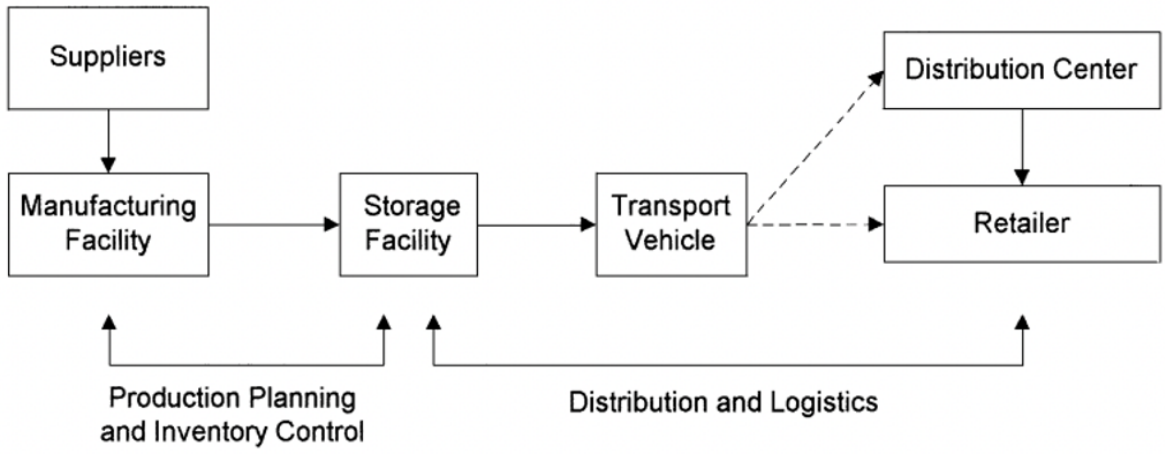


Figure 4. *Supply chain diagram (Beamon, 1998).*

Beamon defines the Supply Chain as an integrated process in which different business entities (e.g. suppliers, manufacturers, distributors and retailers) work together in an attempt to: (1) acquire raw materials, (2) convert these raw materials into specific end products and (3) deliver these end products to retailers. This chain is traditionally characterised by a forward flow of materials and a backward flow of information" (Beamon, 1998). Carter et al. spoke of a supply chain as a network consisting of nodes and links. More explicitly, we define a node as a firm that is an agent that is able to make decisions and maximise its profit within the parameters in which it operates (e.g. manufacturers, warehouses, transport carriers and financial institutions (Carter et al., 2015).

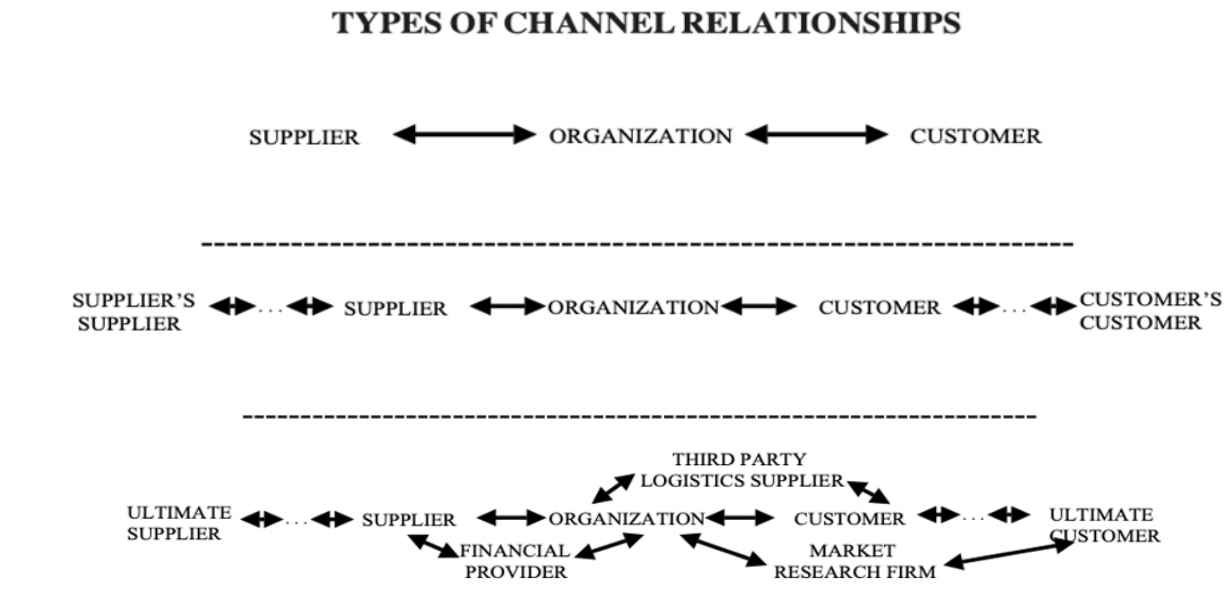


Figure 5. *Supply chain diagram on the types of channel relationships (Cooper and Ellram, 1993)*

A link, on the other hand, is explained as the connection between two nodes. Links represent transactions that consist of the flow of materials, information and/or funding between nodes. Building on these concepts, we arrive at the basic premise that: The supply chain is a network, made up of nodes and links and the activities that are carried out within the chain all have the same level of importance because they are all indispensable to the subsistence of the chain itself and have the sole purpose of guaranteeing service. This interdependence between them causes the chain to break down if an activity fails or a supplier does not complete the work for which it is responsible; the effectiveness of the supply chain is the sum of the coordinated work of all the links that form it. (Stevens, 1989)

Effective management of the chain in which the company operates is crucial to the success and competitiveness of the company, becoming a real driver for success in a changing market (Barla, 2022). The various general processes throughout the supply chain encompassing the supply of materials and sub-

assemblies, manufacturing and assembly, warehousing and stock monitoring, order management, distribution and shipment to the customer as well as the management of the information systems required to control all these activities.

Logistics-production systems have expanded and the relationships between the different actors have become increasingly complex, the focus has shifted from the organisation of the production site and its operations to the management of the entire chain, from suppliers upstream to the final customer downstream. This new global vision pursues the joint optimisation of the entire system and is therefore deeply linked to an integrated and coordinated management model of all its actors, which makes the exchange of information its fundamental enabler.

3.4 Sustainable Supply Chain Management

The definition of supply chain seems to be more common among authors than the definition of supply chain management (Cooper and Ellram, 1993), but the term supply chain can also refer to the more managerial aspects of the supply chain. In this case, it would be more appropriate to use the term supply chain management (SCM), which refers to the coordination activities that serve to optimise the individual links in the supply chain. If the supply chain is simply something that exists and is identified with the distribution channels and phenomena that exist in the business world, SCM requires a managerial effort from the companies that form it and thus emphasises the fact that supply chains exist regardless of whether they are managed or not.

The term Supply Chain Management is best defined by Cooper et al. as "the integration of key business processes, from end-user to original suppliers, that deliver products, services and information that add value to customers and other stakeholders" (Cooper and Ellram, 1993). Definition later expanded by Carter and Rogers who define Sustainable Supply Chain Management (SSCM) as "the strategic and transparent integration and achievement of an organisation's social, environmental and economic objectives in the systemic coordination of key inter-organisational business processes to improve the long-term economic performance of the individual company and its supply chains".(Carter and Rogers, 2008).

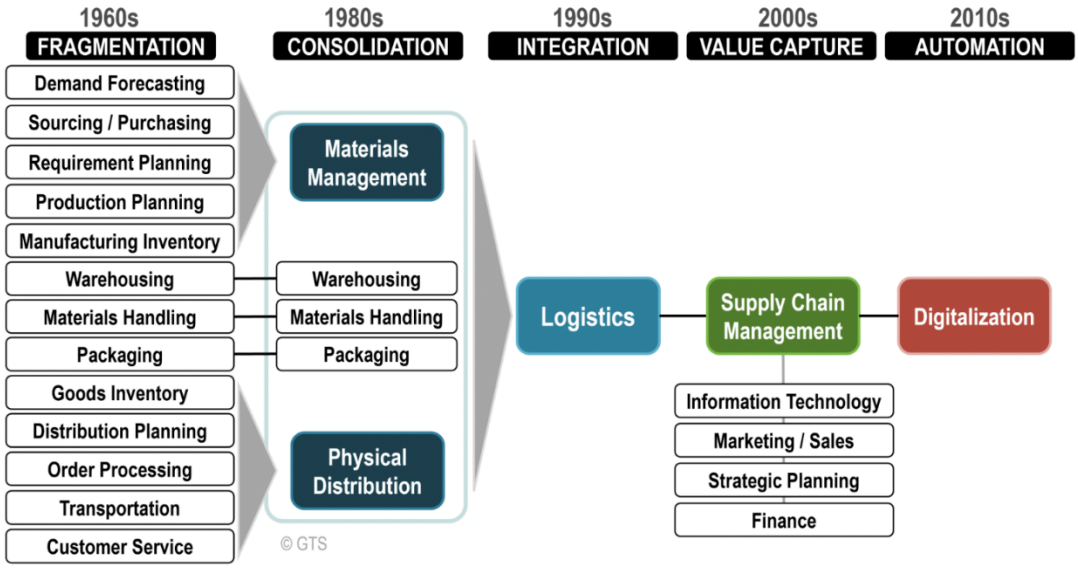


Figure 6. *Supply chain management and its evolution throughout the last decades.*

The importance of analysing and defining Sustainable Supply Chain Management lies in the increasingly important role that companies play today. In fact, companies are often pillars on which various aspects of the surrounding communities are built, just think of companies that support discretionary activities such as

philanthropic donations, health care, child care and educational opportunities, of course with these opportunities also come responsibilities that we will define later in the chapter on Corporate Social Responsibility.

While in general, a company can be said to be sustainable when it integrates ESG factors into its decision-making process, some studies have to be used to define the socially sustainable part. For example, Seuring and Muller, in 2008, analysed the limitations of studies on the subject and came to the conclusion that social aspects are often neglected in sustainable development, which is due to a lack of knowledge of sustainability issues or the misinterpretation of them. In many cases, companies refer to the aforementioned definition of sustainability set out in the Bruntland Commission, but do not understand its application in particular, as the topics dealt with are of a macroeconomic nature.

While recent interest in social sustainability has prompted scholars to question how social sustainability has been considered in the study of supply chain management, little attention has been paid to exploring how the implementation of SSCM practices at the social level can be effectively facilitated and enhanced (Alghababsheh and Gallear, 2021).

In order to shed more light on the topic, it is necessary to define the actors and decisions that give rise to supply chain management: first of all, we encounter three important actors, which are the focal company, the suppliers and the stakeholder groups (Seuring, 2013). The main step for a supply chain to subsist is the choice of supplier and, in the light of changing business trends and stakeholder influence and given the strong pressures to avoid commercial and reputational damage, (New, 2015) this is done by evaluating the choice of supplier against social impact criteria (Hutchins and Sutherland, 2008). To simplify, organisations are required to address social sustainability issues not only in their operations, but also in the broader supply chain networks in which they operate. (Miemczyk et al., 2012).

Klassen and Vereecke (2012) pointed out that a commitment by the larger acquiring company to provide financial incentives, training and development to suppliers could facilitate the adoption of social sustainability measures. (Klassen and Vereecke, 2012), important, therefore, is the guiding figure of the focal company that must respect and be in line with the principles of social sustainability: provide fair opportunities and encourage diversity.

To this end, the United Nations Division for Sustainable Development has drawn up a series of social indicators covering a range of topics, the latter used to describe the 'social' performance of a nation or a well-defined territory. There are many issues that can be encountered in this type of analysis: the vastness of the subjects to be analysed, the form of government and the policies it implements, social and cultural expectations, but above all the economic and business activities that include companies in the area. Many companies are influenced by external factors during the implementation of the right social sustainability practices and that these factors cannot be controlled in most cases (think of changing tax rates). At this point,

the companies' personal interpretation of the sustainable changes to be implemented becomes of utmost importance.

This is where our qualitative empirical analysis process comes in, which will specifically analyse the Manifatture Sigaro Toscano company's interpretation of the application of social sustainability issues. Although it is an example, its value is intrinsic in the analysis of the actions applied by the company so far in this field. Consider the analysis of specific information such as sustainability reports, social responsibility reports and citizenship initiatives. In the current work we will identify some social indicators to be analysed and compared with others chosen from scientific articles, it must be said that these indicators do not fully cover all dimensions of social sustainability, but address a wide range of human and social needs that are a starting point for assessing social sustainability throughout the supply chain.

3.5 Industry 4.0

Since the dawn of humanity, man has been driven to improve himself, and with the improvements and integration of new industrialisation processes came the so-called industrial revolutions. The first took place in the field of mechanisation, the second through improved use of electricity and the third through widespread digitisation. In a present where scenarios in which products control their own production process are increasingly emerging, the fourth industrial revolution is born.

The first use of the term Industry 4.0 dates back to 2011 when it was presented in Germany at the Hannover Messe by a working group representing the Research Union Economy-Science of the German Ministry of Education and Research (Culot et al., 2020). The term summarised what had been happening in the world of industry for a few years and the imminent revolution that was about to take place in the world of manufacturing. Although one would expect a clear definition of Industry 4.0, recent research works instead show a clear omission in the conceptualisation of the phenomenon.

Technology had already permeated some areas of society with the advent of computers at the end of the last millennium. Within industries, on the other hand, it is not yet firmly present, but is rising rapidly. Riding on the high capacity and desire for innovation of many companies and in conjunction with the increase in mechanisation and automation, the work process has increasingly become characterised by the use of technical aids to support physical work.

In addition, networking and digitisation of produced goods and services have caused digital processes to evolve exponentially leading to increasingly digitised environments. Working environments are undergoing a transition to Industry 4.0 due to the presence of technologies such as simulation or augmented virtual

reality.The process of miniaturisation has resulted in the saving of space, where previously it was used for computers or large machines it is now replaced by much more powerful and physically contained installations.

The success of this innovation has led to the efficient development of supply chains that have become faster and longer thanks to automation that has made it possible to track and trace goods in production, in the warehouse or in transit. Significantly increasing production processes in the context of logistics has not only turned industrial production practice on its head (Lasi et al., 2014).

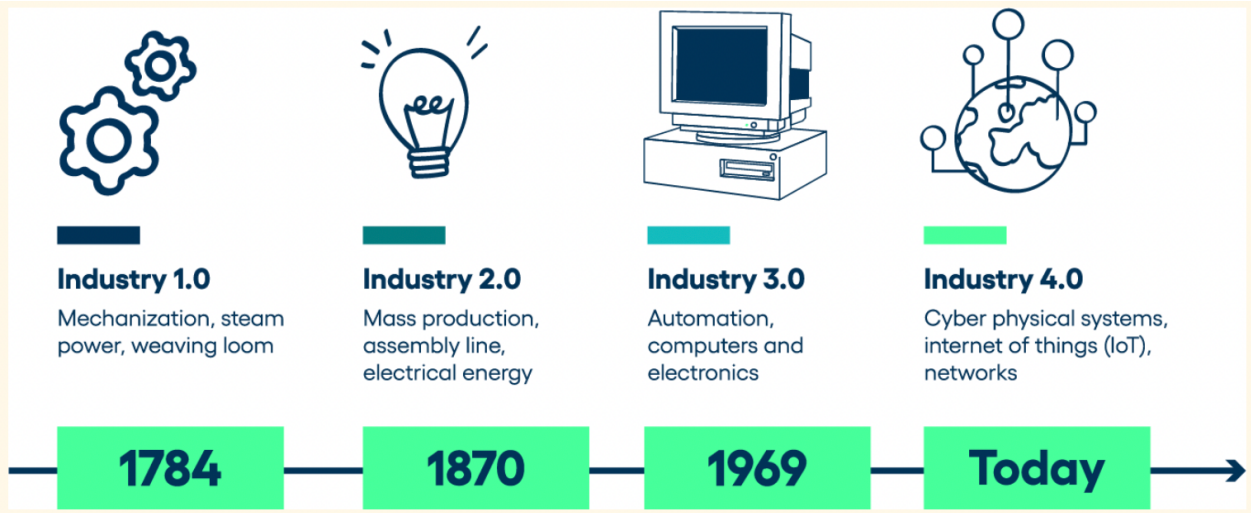


Figure 7. *Evolution of industry by date*

The internal and therefore social aspects of the companies have improved considerably, an example of this is the case of Manifatture Sigaro Toscano, which decided to implement the Track & Trace tool to make the supply chain more efficient and at the same time tackle problems such as smuggling. Considering Technology and People as two important levers for company growth, MST decided to develop the Track & Trace project, which, as mentioned, was created to counter the illicit trade of tobacco products within the European community. The tool is aimed at intercepting disruptions in the supply chain, safety issues or product origin. The implementation of the new system is closely linked to the adaptation of the EU regulation (Directive 2014/40/EU) article 15-18) that will become mandatory on 20 May 2024 and that will exclude from the market all companies that have not adapted their business to the standard.

The decision to make the product traceable through the use of this technology is a winner in several respects:

1. ***Efficiency*** = in fact the quality and quantity of information put into the system is a great opportunity. Errors during storage, picking, handling and delivery are reduced to zero, and out of stock and product shortages are minimised.
2. ***Security*** = In the case of a compromised product or batch, maximum transparency can be provided and guaranteed, so that the batch can be traced back immediately, or when something was mishandled.
3. ***Protection against fraud*** = Traceability enables companies to protect their production from the black market.

The aim of the project, in addition to regulatory alignment with European law, is to make supply chain activity more transparent. To this end, all the actors in the supply chain must register every incoming and outgoing product movement, so that it can be traced in the system and digitally transmitted to the competent European bodies. Thus, an information flow is generated towards the bodies in charge of tracking and tracing. This traceability is achieved through the detection of unique codes affixed to each handling unit (packet, carton, package and pallet) from the producer to transport to the tobacconist's shop.

The combination of people and technology allows the creation of tools that help modern companies to ride the evolution and sudden changes we have witnessed in recent years. Another example of technology implementation is the smart, safe, innovative and efficient lifting machines, which is implemented at the MST manufacturing site in Lucca. Here, manual work has been complemented by a very important component that improves processes on the assembly line, the automation of certain functions makes production faster and more efficient, and also meets the growing demand for safety.

Safety had already been worked on for several years with the implementation of practices to improve the situation of employees, with the advent of automation the desired performance levels were achieved. New technologies become an enabler, an opportunity for those who introduce hoisting machines into their production processes to get closer to the world of Industry 4.0 and to respond to changes dictated by market requirements in a correct and efficient way.

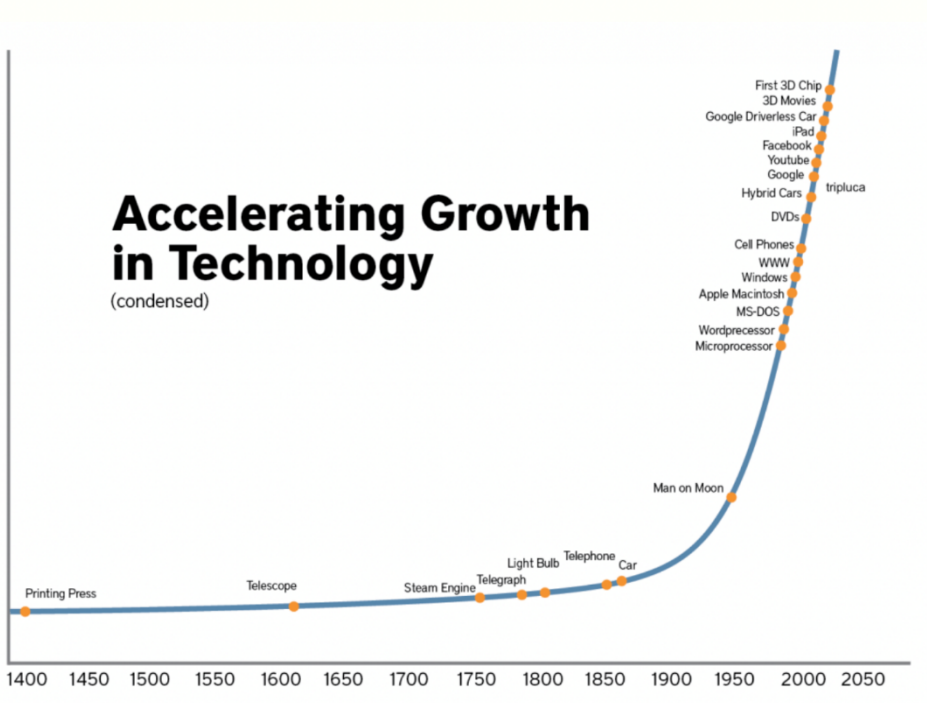


Figure 7. *The graph shows the impact of efficiency within the industrial sector and its conquers.*

3.6 Agricolture 4.0

If the term we use to refer to the digital transformation in manufacturing environments is 'Industry 4.0', the entry of Fourth Industrial Revolution technologies in the agrifood sector is 'Agriculture 4.0'. In fact, Agriculture 4.0 refers to the upgrading of traditional production methods and strategies of global agriculture towards an optimised value chain, using a range of emerging technologies that enhance disruptive solutions at all stages of the agricultural production chain. (Silveira et al., 2021)

The implementation of Agriculture 4.0 practices is revolutionising the way we produce and interact. Innovations in agriculture are transforming a world that was permeated by traditionalist practices towards innovation. The purpose of implementing these practices is not only to support the farmer in the activities inherent to cultivation, but to facilitate relationships with all the links in the supply chain so as to generate value for his company and its partners.

Manifatture Sigaro Toscano, given the importance and incisiveness of this topic in the product's production process, has decided to publish a report on good agricultural practices whose objectives are:

1. Giving guidance in order to produce tobacco in a responsible and sustainable way.
2. Another objective, is to practise responsible agriculture that is attentive to the land and the environment, with a rational use of available resources while preserving sustainability through the appropriate and correct use of pesticides.
3. Protect water resources, soil, air and plant and animal life as well as pollinating insects.

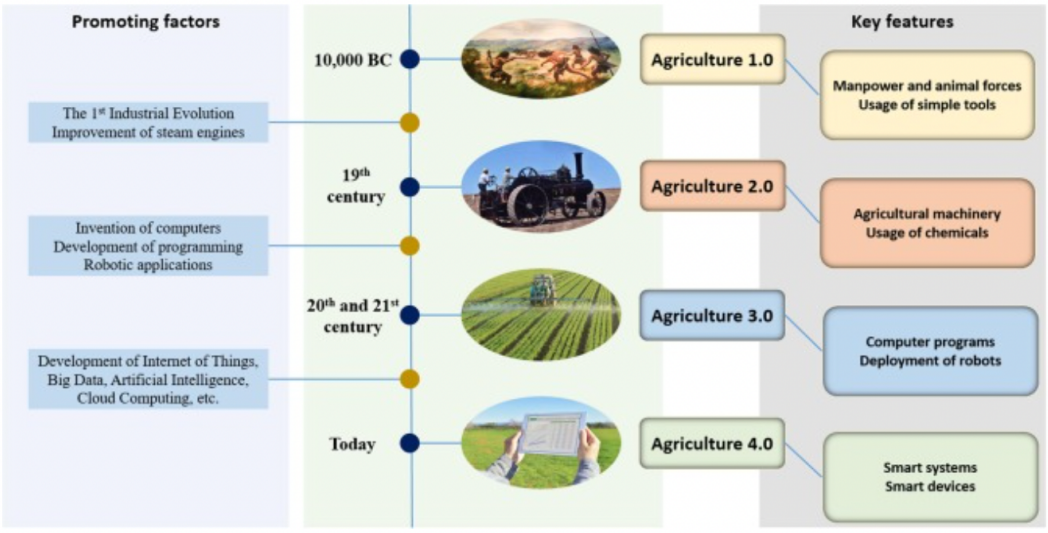


Figure 8. *Evolution of the concept of agriculture and its steps to our days*

4. Corporate Social Responsibility

Sustainability is linked to corporate social responsibility, as a socially responsible company should ensure that its impact on the natural environment is minimised. Corporate Social Responsibility goes beyond the natural environment to include aspects such as fair trade, good employment practices and appropriate relationships with customers, suppliers and other stakeholders (David B Grant et al., 2017). Some economists have studied a way to turn these attentions that the company must provide to the social into profit, Drucker (1954) suggests turning social problems into economic opportunities, economic benefits, productive capacity, human competence, well-paid jobs and wealth. Johnson (1971) perceived social responsibility as a way to achieve profit maximisation in the long run.

Nowadays there is more and more competition between companies, this leads managers to make important decisions in order not to lose competitiveness, these decisions in most cases can be the result of a negative trade-off that sees social and environmental responsibilities sidelined. The definition of CSR, mentioned above, should be augmented by adding that a company has the responsibility to make profits but must do so within the legal, ethical and discretionary terms that society expects from a company at any given time (Carroll, 1979).

Grant et al. drew up a hierarchy of responsibilities that a company should follow in order to help give new meaning to CSR. In first place, as mentioned above, is economic responsibility, which is the hierarchical basis on which all other responsibilities rest and which makes companies profitable and allows them to invest earnings in sustainability practices as well. Legal responsibility is the second hierarchy of responsibility. Companies must obey the law because it is society's codification of what is right and wrong. Ethical responsibility is last within this special ranking and deals with the obligation to do what is right and fair and to avoid harm (David B Grant et al., 2017).

Companies need to incorporate all these types of responsibilities to achieve model results and avoid falling into unethical behaviour, and to this end many commercial and non-commercial organisations and industry associations have developed some very good CSR attitudes. A step that is slowly becoming more and more important and in some cases indispensable is the evaluation practices performed by a 'focal company' on its suppliers to assess their actual socially sustainable footprint (Dyer and Singh, 1998). We find an example in codes of conduct (COD) or codes of ethics (COE). The code of conduct sets out the company's values in a charter of principles that employees must adhere to in order to mediate interpersonal relationships within the company.

Figure 9. *Different types of responsibility within the industry and their range of importance in the decision process*

The choice to adhere to these codes is not legally binding, but conditional on the mandatory presence of an internal supervisory body that acquires additional responsibilities. This body has the duty to act as a role model for colleagues, supervise the company's actions, assess the consistency of actions with the codes and as a last resort punish any omissions with sanctions proportionate to the infringement committed. Increasingly, suppliers are being required to hold certifications developed and issued by high-profile independent bodies (Ni and Sun, 2018) one example is the SA8000 certification, an accredited standard that certifies companies' commitment to sustainable development with an emphasis on social issues.

With this certification, all activities that have an impact on workers' conditions and the training and professional development of employees can be monitored. The certification takes as an example those principles suggested by international references in the field of human and labour rights and aims at the respect of well-prescribed parameters throughout the supply chain, such as:

- *child labour*
- *forced labour*
- *health and safety*
- *freedom of association, right to collective bargaining*
- *discrimination*
- *disciplinary practices*
- *working hours*
- *pay*

- *management system*

Furthermore, an important aspect of certification is the possibility of extending monitoring and verifying the ethical compliance of suppliers as well, in order to make the entire corporate supply chain socially sustainable. These practices listed above and many others are monitored and evaluated by the focal company through the use of audits (Huq and Stevenson, 2020).

Audits are defined as "procedures through which internal or external auditors systematically verify whether a supplier complies with the requirements contained in a given code of conduct" (Lund-Thomsen, 2008). Audits can be supervised and carried out by three parties, the focal company, the supplier itself or a third-party auditor (Huq et al., 2016), but recent problems and bribery through payment of bribes that have occurred in some Indian companies (Huq, 2014) have led many buyers to physically inspect facilities, check records and documents and conduct interviews with workers themselves (Ciliberti et al., 2009).

Figure 10. *Types of certificates used to certify corporate social responsability*

4.1 Sustainability Report

Another very important tool to keep corporate sustainability practices under control is the Sustainability Report or also called Non-Financial Statement (DNF). It gives a very precise definition: "is a report prepared by a company or a public organisation to provide its stakeholders with information on the economic, environmental and social impacts caused by its activities".

The declaration has undergone many evolutions over the years, if until recently companies were free to declare their activities impacting on sustainability, with the entry into force of the Legislative Decree of 30 December 2016 No. 254 aligned with the European Directive No. 95/2014, the choice has disappeared, making the practice a compulsory form. Thus the Sustainability Report has surpassed in effectiveness the previous instruments for reporting social and environmental sustainability performance.

Manifatture Sigaro Toscano is committed to reducing the risk of injury and/or improving the level of safety, Making the work environment ergonomic and comfortable, Eliminating the possibility of using defective parts and/or parts, Reducing wasted time searching for tools and/or objects, Reducing the risk of contamination of production facilities, Keeping equipment efficient with maintenance and cleanliness, Reducing non-value-added activities.

The protection of people is of primary importance to MST. Employees represent an added value for the company, in the light of the specific skills they have acquired over the years: it is therefore essential to invest in a working environment that encourages them to maintain high quality standards, protects their well-being and allows them to develop professionally. Similarly, the company takes up the legacy of a tradition manufacturing tradition that characterises the history of many territories: it is for this reason that MST must guarantee support for its communities and itssupply chain in continuity with the constant commitment shown in favour of Made in Italy, farmers and their families.

4.2 European Commission & Law

Businesses are one of the main stakeholders for the achievement of the UN Agenda 2030 Sustainable Development Goals:

Figura 11. *Sustainable Development Goals as stated by the United Nations.*

On 21 April 2021, the European Commission adopted a proposal for a Corporate Sustainability Reporting Directive (CSRD) to revise and strengthen the provisions introduced by the 2014/95 Non-Financial Reporting Directive (NFRD). The proposal will amend the current reporting requirements (Council and European Commission, 2014).

Here are the main points:

- Extension of the scope of application to: all large companies (companies exceeding, for two consecutive financial years, at least two of the following thresholds: 250 average employees, 20,000,000 Corporate Balance Sheet Proposals and 40,000,000 revenues); Sustainability Reporting all companies listed on European regulated markets (excluding listed micro-companies).
- EUROPEAN COMMISSION: this enlargement of the perimeter would imply the involvement of approximately 49,000 European companies (as opposed to the approximately 11,700 currently covered by the NFRD). Brussels, 21.4.2021 COM(2021) 1 9 final Mandatory audit, at least in a limited assurance form, of the NFRD. 2021/0104 (COD) Introduction of more detailed reporting requirements and submission of Proposals for a disclosure according to the EU Sustainability Reporting Standards to be defined DIRECTIVE OF THE PARLIAMENT AHE COUNCIL by the EU (EFRAG has been mandated to provide technical advice on the development of the new amending Directive 2013/34/EU, Directive 2004/109/EC, Directive 2006/43/EC Regulation (EU) No 537/2014, as regards European

corporate sustainability reporting standards). Mandatory reporting of sustainability information within the annual report and disclosure in digital and machine-readable format. Transposition of the directive is expected by December 2022 and will apply from the financial year 01/01 2023.

Companies that fail to implement these policies must, through the 'comply or explain' principle, justify their failure to do so. We find other types of legislative adjustments by the company in what is the workers' statute and in particular in the first three statutes concerning:

- Title I of the Statute (arts. 1 - 13) regulates rights and prohibitions aimed at guaranteeing the freedom and dignity of workers; in particular on the freedom of opinion of the worker (art. 1), regulation of the power of control (arts. 2 - 6) and disciplinary power (art. 7), and of duties and transfers (art. 13).
- Title II (arts. 14-18), dedicated to trade union freedom, in affirming and regulating the cardinal principle of the right to form and join trade union associations in the workplace (art. 14), sanctions the nullity of discriminatory acts (art. 15), prohibits the formation or support of trade unions of convenience (art. 17) and, in order to make these rights effective, introduces the guarantee of job stability, providing for the protection granted to workers in the event of unlawful dismissal (art. 18).
- Title III outlines the prerogatives of trade union activity in the workplace, through the recognition to the trade union of the power to operate in the legal sphere of the entrepreneur, to achieve its objectives of representation and protection.

5 Methodology of measuring

In the past few years, Labuschagne and Brent developed a framework for ranking measures of social sustainability and found it applicable in 10 case studies. But when used to determine the "social footprint" (analogous to the "environmental footprint") associated with three target projects, they failed to calculate all the indicators in the social midpoint category they had proposed. This indicates that many of the proposed frameworks for social sustainability or corporate social responsibility may be difficult to incorporate into decision-making activities.

Recently, a new framework has been proposed in order to adress high variability- decision making problems. These category of methods give a quantitative measure of the impact of social sustainability within manufacturing companies. In our case, MCDM methods were selected from the various classes of analysis methods available. In an MCDM problem, a number of alternatives are evaluated with respect to a number of criteria in order to select the best alternatives (Rezaei, 2015). Below, the theoretical fundaments are presented, with particular attention to a simple, effective sub-category: the best-worst method (BWM).

5.1 MCDM & BWM

Multi-criteria decision-making (MCDM) is a very important branch of decision-making theory. MCDM problems are generally divided into two classes with respect to the solution space of the problem: continuous and discrete. To handle continuous problems, multi- objective decision-making (MODM) methods are used. Discrete problems, on the other hand, are solved using multi-attribute decision- making (MADM) methods.

In existing literature, MCDM is commonly used to describe the discrete MCDM, which is the method we are going to use in our example.

A ‘discrete MCDM’ problem is generally shown as a matrix, as follows:

$$A = \begin{array}{c} \\ a_1 \\ a_2 \\ \vdots \\ a_m \end{array} \begin{array}{c} \begin{array}{cccc} c_1 & c_2 & \cdots & c_n \end{array} \\ \begin{pmatrix} p_{11} & p_{12} & \cdots & p_{1n} \\ p_{21} & p_{22} & \cdots & p_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ p_{m1} & p_{m2} & \cdots & p_{mn} \end{pmatrix} \end{array}$$

Where $\{a_1, a_2, \ldots, a_m\}$ is a set of feasible alternatives (actions, stimuli), $\{c_1, c_2, \ldots, c_n\}$ is a set of decision-making criteria, and p_{ij} is the score of alternative i with respect to criterion j. The goal is to select the best (e.g. most desirable, most important) alternative, in other words an alternative with the best overall value. The overall value of alternative i, V_i can be obtained using various methods. In a general form, if we assign weight w_j $\left(W_j \geq 0, \Sigma w_j = 1\right)$ to criterion j, then V_i can be obtained using a simple additive weighted value function, which is the underlying model for most MCDM methods, as follows:

$$V_i = \sum_{j=1}^{n} w_j p_{ij}$$

What is very important here, and which has been the impetus of introduction of several MCDM methods during the last decades, is the way in which the weights of the criteria or vector w =), $\{w_1, w_2, \ldots, w_n\}$ is obtained.

Here we try to make a better understanding of the so-called pairwise comparison, which, makes the foundation of the method we chose (BWM).

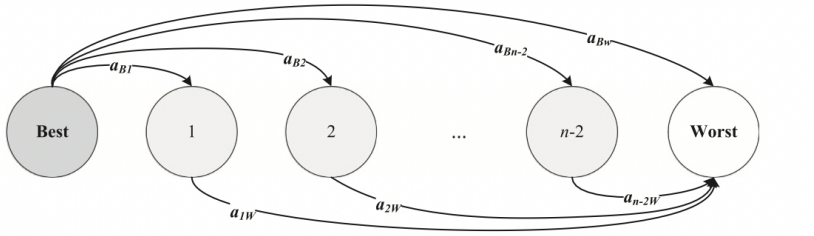
Suppose we have n criteria and we want to execute a pairwise comparison between these criteria using a 1/9 to 9 scale. The resulting matrix would be:

$$A = \begin{pmatrix} a_{11} & a_{12} & \cdots & a_{1n} \\ a_{21} & a_{22} & \cdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ a_{n1} & a_{n2} & \cdots & a_{nn} \end{pmatrix}$$

where aij shows the relative preference of criterion i to criterion j. aij = 1 shows that i and j are of the same importance. aij > 1 shows that i is more important than j with aij = 9 showing the extreme importance of i to j. The importance of j to i is shown by aji. In order for matrix A to be reciprocal, it is required that aij = 1/aji and aii = 1, for all i and j. Considering the reciprocal property of matrix A, in order to obtain a completed matrix A, it is necessary to have n (n - 1)/2 pairwise comparisons. The pairwise comparison matrix A is considered to be perfectly consistent if:

$$a_{ik} \times a_{kj} = a_{ij}, \quad \forall i,j$$

If we think back to the comparison matrix we see that, for n elements, all the possible comparisons are n^2. From this, we can conclude that n comparisons are a_{ii}= 1. The rest is n$(n-1)$ for half of which $a_{ij} \geq 1$ while the other half are the reciprocals of the first half. From the first n$(n-1)/2$ comparisons, 2n-3 are reference comparisons, and the rest are secondary comparisons.



Each secondary comparison a appears in two relation chains, two members of which are reference comparisons:

$$a_{best,i} \times a_{ij} = a_{best,j}, a_{ij} \times a_{j,worst} = a_{j,worst}$$

5.2 Case analysis Manifatture Sigaro Toscano

The internship at Manifatture Sigaro Toscano was a very useful and interesting experience for me, during the period I spent learning about the manufacturing process and the logic of sustainability proposed, I thought it would be useful to apply the described method to a specific real case. Therefore, data collection and interviews were conducted for the purpose of accumulating data to be later analyzed. Where available, existing rating scales were proposed in order to obtain sustainability criteria as relevant as possible to measurable values (Khokhar et al., 2020).

Several interviews were conducted with employees of Manifatture Sigaro Toscano company. The employees belong to different sectors of the company, namely: Dr.C.Chindemi (Head of Human Resources); Dr.B. Bergantino (head of communication and sustainability project); F.Passerini (head of security sector); Dr. P. Speranza (head of right agricultural policies).

The choice to select candidates from different sectors of the company allows us to have an overall view of the procurement process and its sustainability; the candidates were asked three questions:

1. What is sustainability for you, if you had to give a general definition?
2. If you had to select three general criteria regarding sustainability to implement in your company, what would they be?
3. Considering all that the worker can do for the company and the company for the worker, if you could choose one criterion related to social sustainability, what would it be?

The questions were submitted in the form of a questionnaire as given below:

MST interview instructions

In light of the thesis project I am pursuing with LUISS under the supervision of Professor Raffaele Fabozzi, I would need to conduct a series of interviews in order to collect useful qualitative data.

The interview will have the following steps:

PRE- INTERVIEW PHASE (by May 2 1:00 pm).

The interviewee will need to choose three general sustainability criteria that he/she feels are important for his/her role in the company. To have a guideline of the criteria to choose, please see the attached list of examples. (Inserire lista in forma di tabella)

a. Environmental Sustainability

The concept of corporate environmental sustainability is based on the "Environmental" criteria, which takes into consideration how a company contributes to environmental challenges and actively fights climate change. In fact, a sustainable company is primarily an environmentally friendly company, which translates, for example, into virtuous actions aimed at:

- Reduce polluting emissions;
- use renewable energy;
- decrease environmental impact;
- curb water consumption (and the Planet's other resources);
- carefully dispose of waste;
- adopt circular economy solutions;

b. Social sustainability

The concept of corporate social sustainability is based on "Social" criteria, which relates to how the company behaves to the social fabric in which it operates: the goal is to adopt a business development model that has a positive impact on the community. Here, a company focused on social sustainability will care about issues such as:

- occupational safety;
- workers' rights;
- equality and social justice;
- the well-being and inclusion of the people who work in the company;

c. Economic sustainability

Corporate economic sustainability refers to "Governance" criteria, which analyze the way a company is administered and the ethics of the decisions made. A sustainable company is in fact a company that is able to produce value for the community, the organization and all stakeholders affected by the company's activities, acting with the aim of producing profits in an ethical manner. To achieve this goal, a sustainable company:

- invests in innovation, technology, digitization and research;
- pays its staff and suppliers appropriately;
- has a fair pricing policy;
- favors certified and local raw materials;
- contributes to the development of the local economy;
- manifactures products and services that are useful and can improve the lives of consumers;

The interviewee should choose a criterion of SOCIAL sustainability (OUT OF THE LIST) that characterizes according to her/him their department.

It would be essential, for the purpose of the thesis work, that respondents choose the criteria before the beginning of the FIRST INTERVIEW (May 2), only then will it be possible to sort the criteria in the next phase.

INTRA-INTERVIEW PHASE

The respondent will be asked for his or her definition of sustainability.
Then, he will have to sort the criteria chosen by the other respondents by giving a grade from 1-9 based on what they think is most socially sustainable for the company.
Lastly, the interviewee will need to sort the criteria chosen by giving a grade from 1-9 based on what he or she feels is least socially sustainable for the company.

POST-INTERVIEW PHASE (UNDERGRADUATE)

The results of this process will be analyzed using the BWM model in order to identify the most relevant social sustainability criterion in the respondent's area of work.
Attached is the article explaining the method I refer to.

INTERVIEWS

Interview with Dr. C. Chindemi

I: Good afternoon Doctor, what is your role in the company?

D: My role is director of human resources.

I: What is sustainability for you, if you had to give a general definition?

D: Sustainability for me means many things. When I think of sustainability in my area, I think of the future of the business, all those measures to ensure the future of this company, through the development of the skills of individuals, which then translates into a more general logic of organizational development.

I: If you had to select three general criteria regarding sustainability to implement in the company, what would they be?

D: Definitely skills development, a fundamental part of my strategic agenda; all policies to ensure gender balance and inclusion (e.g. activities to support maternity and paternity for a better work-life balance, enhancement of the resources of individuals and the female figure within our business...): to give evidence of our numbers, 60 percent of the workforce in the Lucca plant is female.

So the key points are resource development, gender balance and working to make sure that women have a role in what are the managerial clusters of MST.

This business historically has been one where the apex roles were given to the male gender, both in terms of technical figures and managerial and managerial figures. What we have been doing for a few years now is to try to overcome this concept: in the selection processes that I govern, discrimination makes absolutely no sense and I try to privilege competence, because it is precisely through competence that I can guarantee that medium- and long-term sustainability of the business, whether it is pink or blue.

I: Considering all that the worker can do for the business and the business for the worker, if you could choose one criterion related to social sustainability, what would it be?

Q: Thinking about my department, embracing all areas and following the sustainability process, I had a bit of a hard time choosing them; taking for granted and assuming workplace safety and workers' rights, I selected decreasing the environmental impact, well-being and inclusion of people working in the company, and investing in innovation, technology, digitalization and research.

Interview with Dr. B. Bergantino

I: Good afternoon Doctor, what is your role in the company?

D: I am the communications manager, both internally and externally, and for the past year and a half I have taken responsibility for the sustainability project in the company.

I: What is sustainability for you, if you had to give a general definition?

D: Thinking about sustainability in the company, I think about both the strategy and the production processes to meet the needs and expectations of society and what the world has arranged to do, limiting business impacts but remaining competitive and profitable. In a company, profit is also important and you have to create a widespread and shared culture of sustainability at all levels, doing things better with best practices and also different than in the past.

I: If you had to select three general criteria regarding sustainability to implement in your company, what would they be?

D: Thinking about my department, embracing all areas and following the sustainability process, I had a bit of a hard time choosing them; taking for granted and assuming workplace safety and workers' rights, I selected decreasing the environmental impact, well-being and inclusion of people working in the company, and investing in innovation, technology, digitalization and research.

I: Considering all that the worker can do for the company and the company for the worker, if you could choose one criterion related to social sustainability, what would it be?

D: On the social part, one could give a contribution and support to the territories where we have a presence with the plants and tobacco cultivation. The worker for the company can relate back to the best practices spread at all levels: turning off the light when you leave the room, recycling properly, or raising your hand if you sense that you are doing something wrong. So, the process of employee participation with the aim of optimizing the value chain.

Interview with F.Passerini

I: Good afternoon Doctor, what is your role in the company?

D: I am the head of safety and environment, so I hold the role of SPP for MST and then I am in charge of the environmental and waste cycle aspects.

I: What is sustainability for you, if you had to give a general definition?

D: It is a way of approaching business that allows for the maintenance of resources over time and ensures for citizens the possibility of living in a perpetual environment.

I: If you had to select three general criteria regarding sustainability to implement in your company, what would they be?

D: Regarding our type of business certainly the waste aspect, adopting circular economy solutions. Most of our waste is plant-based in the form of tobacco plant residues; being able to find ways to put them back into the cycle without sending them to landfill would be something virtuous. On the social side, I can only say occupational safety, and given the social costs associated with health care, occupational safety is a central node of sustainability and also a thermometer of what is the degree of civilization of a society and a company. Lastly, another extremely important element seems to me to be to pay staff and suppliers adequately; I come

from the petrochemical world, where often the big companies would play down, putting the contractors in a situation where they were not earning a lawful and fair profit, and this was reflected in personnel safety issues. So paying both your employees and your contractors fairly has implications not only economically and is absolutely a key issue.

I: Considering all that the worker can do for the company and the company for the worker, if you could choose one criterion related to social sustainability, what would it be?

D: I would have to say that the MST company is a virtuous company from that point of view and it seems to me that from what may be the goals that can be pursued the company tries to pursue them, but certainly from safety to equality, to workers' rights are all issues that MST is sensitive to and protects and I find all of them so important and that MST does as well because of the commitment it puts towards these issues.

Interview Dr. P. Speranza

I: Good afternoon Doctor, what is your role in the company?

D: In the past I started by doing technical assistance to growers, dry tobacco estimates, and purchases from growers. As the years went by and the company grew and expanded abroad, I set up a company in Peru from scratch because we only had the land along the river, from the treatment rooms to teaching the local people. Even now I am still involved in this production, I follow this company in Peru for the pre - manufacturing process of the tobaccos; before they are used, in fact, they have to be stabilized to be handled safely by the workers. Today I am in charge of corporate social responsibility, we have a process that is necessary to be able to sell the tobaccos that we do not use to multinationals and with it a series of useful fulfillments to prove that our tobacco is made following agronomic and environmental regulations. I am involved in testing abroad too.

I: What is sustainability for you, if you had to give a general definition?

D: Basically, sustainability referring to soils means the capacity that this soil has to be able to allow crops, preserving the fertility characteristics and good conditions, that we don't go to deplete these soils or go to pollute them by over-exploitation.

I: If you had to select three general criteria regarding sustainability to implement on the farm, what would they be?

Q: From the environmental aspect, trying to use as few pesticides as possible. The review of these pesticide products by the European community narrows more and more the field, you go to look for products from organic farming, we do integrated pest management so you use all types of pest control: organic chemistry etc. and you try to have a result in the tangible comparisons of the soil, the environment and the plants as little impact as possible. Same with regard to water, we try through drip irrigation systems or with efficiency to do targeted irrigations based on a water balance, to assess the needs and we assess the conditions of need of the plant; based on this we proceed with irrigations. Soon we will be able to use these tools of agriculture 4.0: satellite maps, geo-referenced, use of variable ratio machines, fertilization calculated according to the plot, and if there is disformity we will make a different approach in using fertilizers, we are at the forefront in this aspect and we follow the trend of general directions.

I: Considering all that the worker can do for the company and the company for the worker, if you could choose one criterion related to social sustainability, what would it be?

D: We adhere to this social responsibility program and among the various elements required is this one related to workers, we follow the rules of the legislative regulations and we make contracts and work time, vacation breaks according to the regulations. We also require our suppliers to adhere to a code of behavior and discipline, where we require that workers are paid fairly, that there is a labor contract and that there is no exploitation. In addition to requiring it in the contract we do an annual audit where we check these things: an outside company comes and takes a sample of companies that are then audited and we check all these aspects related to labor but also related to the use of pesticides, fertilizers and everything related to good agricultural practice.

5.2.1 Decision criteria determination

At the end of the interviews, some general sustainability criteria (environmental, socio-economic, energy and financial sustainability) were determined:

- Development of workers' skills
- Gender balance and inclusion
- Decreased environmental impact (Reduced use of chemicals in cultivation; Efficient and targeted irrigation; Virtuous waste recycling and circular economy solutions)
- Technological innovation and research
- Fair payment for suppliers and customers
- Agriculture 4.0 (use of satellite maps etc.)

And some sustainability criteria in its purely social sense:

- Business climate monitoring (worker well-being and work-life balance)

- Active contribution and support to agricultural territories and manufactures
- Adaptation to national and European standards regarding safety and workers' rights.

The criteria were implemented within an Excel code capable of assessing, by BWM method, the balance of business components in terms of sustainability.
By filling in the code several times, substituting social sustainability criteria for general sustainability criteria, different probability distributions are obtained, each representing the impact of the individual criterion on the totality of the judgment.

Below we can see the screenshots for a BWM method with 9 criteria, 6 of which are general sustainability criteria and 3 are social sustainability criteria:

Criteria Number	Names of Criteria
Criterion 1	Sviluppo delle competenze dei lavoratori
Criterion 2	Equilibrio di genere ed inlcusione
Criterion 3	impatto ambientale
Criterion 4	Innovazione e R&D
Criterion 5	Pagamento equo
Criterion 6	Agricoltura 4.0
Criterion 7	Monitoraggio del clima aziendale
Criterion 8	Supporto alle comunità agricole
Criterion 9	Adeguamento alle norme nazionali ed

5.2.2 Identification of the best and worst criteria

In light of what was said in the interviews, we identify the best and worst criteria to be taken into account in our analysis:
Best: Business climate monitoring; **Worst:** Agriculture 4.0 (solely because it has yet to be implemented effectively at the operational level within the company)

Select the Best	Monitoraggio del clima aziendale
Select the Worst	Agricoltura 4.0

5.2.3 Finding the preference of best criteria over other criteria

Scores for the best criterion were determined by the respondents:

Agriculture 4.0 = 9

Worker skill development = 3

Gender balance = 3

Decreased environmental impacts = 7

Technological innovation and research = 6

Fair payment of suppliers and customers = 4

Active contribution and support to agricultural territories etc. = 3

Adherence to standards = 2

From these grades we construct the Best to Worst Criteria vector which has the following form:

$$Ab = (1;\ 9;\ 3;\ 3;\ 7;\ 6;\ 4;\ 3;\ 2)$$

Best to Others	Monitoraggio del clima aziendale
Sviluppo delle	3
Equilibrio di genere ed	3
< impatto ambientale	7
Innovazione e R&D	6
Pagamento equo	4
Agricoltura 4.0	9
Monitoraggio del clima	1
Supporto alle comunità	3
Adeguamento alle norme	2

5.2.4 Detecting the Other Criterion Preference over the Worst Criterion

Scores for the worst criterion were determined by the respondents:

Business climate monitoring = 9

Worker skill development = 5

Gender balance = 8

Decreased environmental impact = 2

Technological innovation and research = 3

Fair payment of suppliers and customers = 7

Active contribution and support to agricultural territories etc. = 4

Adherence to standards = 8

From these grades we construct the Best to Worst Criteria vector which has the following form:

$$Aw = (1;\ 9;\ 5;\ 8;\ 2;\ 3;\ 7;\ 4;\ 8)$$

Others to the Worst	Agricoltura 4.0
Sviluppo delle	5
Equilibrio di genere ed	8
< impatto ambientale	2
Innovazione e R&D	3
Pagamento equo	7
Agricoltura 4.0	1
Monitoraggio del clima	9
Supporto alle comunità	4
Adeguamento alle norme	8

5.2.5 Finding the optimal weights for the criteria

The optimal weight for the criteria is the one where, for each pair of W_B / W_j and W_j / W_W, we have W_B / $W_j = a_{Bj}$ and W_j / $W_w = a_{jW}$. To satisfy these conditions for all j, we should find a solution where the maximum absolute differences $\left|\frac{W_B}{W_j} - a_{Bj}\right|$ and $\left|\frac{W_B}{W_j} - a_{jW}\right|$ for all j is minimized. Considering the non-negativity and sum condition for the weights, the following problem is resulted:

$\min \max_j \left\{\left|\frac{W_B}{W_j} - a_{Bj}\right|, \left|\frac{W_B}{W_j} - a_{jW}\right|\right\}$ s.t.

$\sum_j W_j = 1$

$W_j = 0$, for all j

Problem can be transferred to the following problem:

min ξ

s.t.

$\left|\frac{W_B}{W_j} - a_{Bj}\right| \leq \xi$ for all j

$\left|\frac{W_j}{W_W} - a_{jW}\right| \leq \xi$ for all j

$\sum_j W_j = 1$

$W_j \geq 0$, for all j

Solving problem, the optimal weights $(W_1^*, W_2^*, \ldots, W_n^*)$ and ξ^* are obtained. In some decision-making problems, we have an alternative value i with respect to criterion j (p_{ij}). In our case p_{ij} are not available, as

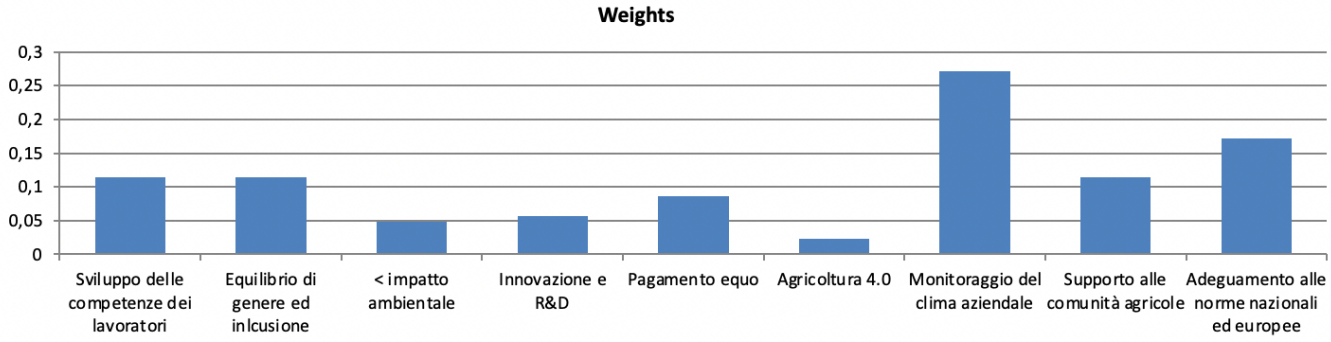
the criteria are purely qualitative; it is therefore necessary to compare the alternatives with each criterion to find pij (the weight of alternative i with respect to criterion j). Eventually, using an appositive programmed is written for the computer and used in Jafar Rezaei's test, the overall score of alternative i is obtained as $V_i = \sum_{j=1}^{n} W_j P_{ij}$. By ordering values of $V_i \forall_i$ the best alternative is identified according to a distribution.

6. Results and discussions

Below we can see the graphs related to the results of our analysis:

Criteria	Weights
Sviluppo delle competenze	0,114224902
Equilibrio di genere ed	0,114224902
Impatto ambientale	0,04895353
Innovazione e R&D	0,057112451
Pagamento equo	0,085668677
Agricoltura 4.0	0,02234835
Monitoraggio del clima	0,271904931
Supporto alle comunità	0,114224902
Adeguamento alle norme	0,171337354

Input-Based CR	0,097222222	The pairwise comparison consistency level is acceptable
Associated Threshold	0,3662	



As can see from the graph in the figure, the obtained probability distribution gives us a representation of the "weight" (here the word weight refers to the effective impact of one criteria over the others) of the criteria within the corporate decision-making process, with particular focus on the issue of social sustainability.

Although the result of a qualitative investigation, the scores previously determined by the interviewee generate a distribution of data in line with the opinion of the corporate decision makers; in fact, it can be observed that the Best criteria (farm climate monitoring) has a higher relevance than the other alternatives. Similarly, Agriculture 4.0 policies, turns out to be well represented as Worst criteria. The other criteria are distributed proportionally, depending on the associated scores.

The algorithm, implemented on the data set described, presents an acceptable level of consistency, an indicator of a judicious choice of criteria and the scores associated with it. The deeper analysis of the graph related to our experience shows how Manifatture Sigaro Toscano can be considered a sustainable company, has it pays attention to sustainability issues, including those of a social nature, putting them at the forefront of their everyday decision making process. This can be observed either in the choice of criteria (Support for agricultural communities, gender balance and inclusion...) and in the weight that these criteria have within the company's decisions (high score associated with criteria with high social relevance, addressing the health and welfare of workers).

Criteria with a lower score (e.g., reducing environmental impact or innovation and R&D) are not to be considered as issues neglected by the company, but rather as the result of the selection process by certain sectors of it. What is important to consider from our point of view is that these criteria are actually taken into account; they represent important areas of investment for the company and it is possible that their evaluation will vary over time, depending on the challenges regarding sustainability that the world and the corporate landscape will face in the coming years.

We would like to emphasize how the method is strongly conditioned by the generality of the choice of criteria, the number of possible alternatives, and the manner of evaluation during the process of constructing the vectors. This may be a limitation from the point of view of its applicability in general terms; however, when evaluated in a context similar to our investigation, the method proves to be elastic, providing a good degree of adaptability.

For example, different evaluations, designed to construct Best to Worst vectors would produce a reweighted distribution of values, with new peaks as a function of the new scores. Choosing different starting criteria instead, by making other business areas participate within the decision making process, would allow us to assess the impact and extend the concept of sustainability to a wider number of decision makers.

It is our opinion that this class of methods may represent a useful tool for analyzing the impact of business choices in terms of sustainability, to be integrated in the future with the other tools already present; its

relevance, tested on a brief case study, appears promising, albeit within the limitations of time and resources proper to this thesis work.

In the future, in order to expand the ranges of possibilities that this type of method offers, it will be possible to select more specific criteria, to increase the number of possibilities, to increase the areas to which these possibilities refer and to proceed with a judicious choice of votes for individual criteria. It is our opinion that in this way it will be possible to obtain comprehensive, truthful picture of the actual decision making process within supply chain management.

7 Conclusions

In this thesis work, the concept of social sustainability was considered, which is a new concept in the field of sustainability, and to this end, the relevant articles and available literature on the subject were analysed, although they are few in number, due to the novelty of the subject. It is important to say that the idea for the thesis work came from the internship experience I had at Manifatture Sigaro Toscano. The activities carried out provided me with skills and led me to develop the definitions of Sustainability, Triple Bottom Line, Social Sustainability, Supply Chain, Sustainable Supply Chain Management, Industry 4.0, Agricolture 4.0 and Corporate Social Responsibility in the thesis in order to theoretically introduce the various definitions pertaining to the supply chain and the topic of corporate sustainability.

At the end of each chapter, a concrete example was included to help understand how the company implements social improvement processes within the main branches of the supply chain. In addition, the work emphasised the importance of technology as a subsidiary means of facilitating industrial work. An important theme was the analysis of the regulation of sustainable issues by the European Commission. Two purposes were taken into account in this thesis work. The first is the novelty given by the application of the BWM method to a concrete case, and the second is the usefulness due to the fact that it was possible for the first time to calculate a value such as that of social sustainability, which up to now has remained without application cases, at least in Italy. The analysis of the results shows that the company taken into consideration applies social sustainability practices in an optimal manner.

The analysis was conducted on the basis of a series of interviews with various parts and subjects of the company. The way in which these interviews were conducted, and the study that led to the obtaining of the data, represents in my opinion a type of investigation that naturally investigates, without the presence of filters, what are the true intentions in terms of sustainability of the company's components and the company itself. The testing of this model has had interesting results that can be applied to any type of company thanks to the ease with which the data can be found. In the future, there are plans to expand the research to include other models in order to make the results more precise and give a 360-degree view of the corporate sustainability process.

I would like to thank Manifatture Sigaro Toscano for the learning opportunity they gave me and their willingness to follow me and provide me with useful material for the thesis.

8 IMAGES ANNEX

Figure 1: https://www.aus.edu/sustainability

Figure 2: https://efinancemanagement.com/financial-management/triple-bottom-line

Figure 3: https://nbs.net/what-is-social-sustainability/

Figure 4: See Bibliography

Figure 5: See Bibiography

Figure 6: https://transportgeography.org/contents/chapter7/logistics-freight-distribution/evolution-supply-chain-management/

Figure 7: https://www.brightlysoftware.com/blog/impact-industry-4-point-0-operations

Figure 8:

Figure 9: https://www.researchgate.net/figure/Figura-43-La-piramide-della-Responsabilita-Sociale-dImpresa-Carroll-1991_fig16_341234863

Figure 10: certificati

Figure 11: https://www.unep.org/

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10 SUMMARY

According to a survey by the World Economic Forum, in the next ten years the most serious threats will come from the environmental and social spheres and will mainly affect companies with significant supply chain activity. (“5 challenges facing global supply chains,” 2022). The case of MANIFATTURE SIGARO TOSCANO is particular and fascinating because, as the company with the highest level of cigar sales and production, it plays a crucial role in achieving full corporate sustainability.

Among the various challenges facing the company, the most imminent one is related to legislative compliance, linked to the concept of sustainability. It is therefore necessary to move from 'one-off' sustainability policies to the adoption of an integrated sustainability strategy that involves the entire corporate organisation and its strategic choices. Starting from the Triple Bottom Line concept and analysing ESG factors, especially the social one, we will look at how the tobacco supply chain is evolving and adapting to legislation.

The aim of this thesis is to investigate the increasingly unique role of all corporate components along the supply chain, the way the company treats people (e.g. human capital management, diversity and equal opportunities, working conditions, health and safety and mis-selling of products) by developing theory on understanding different approaches to corporate rights, but also to understand how new technologies work, the role they play for the company and the symbiosis with employees.

In order to justify and demonstrate how the company is making itself sustainable, a general strategy for considering social sustainability measures is proposed and some social sustainability criteria obtained through interviews with company decision makers are reported. Some of these criteria are then used to demonstrate how, through the BWM method, they can be applied to corporate supply chain decision-making.

The following thesis work will initially introduce the topics of Supply Chain, Supply Chain Management and Social Sustainability, analysing the concepts and preparing the reader for their development in the social sphere. The first chapter will be followed by the chapter in which the Triple Bottom Line concept will be analysed. The fourth chapter will then deal with the implications of sustainability in corporate governance and, in this context, will introduce the concept of Corporate Social Responsibility and how European legislation is moving towards bringing social sustainability into the world of work.

The fifth chapter will aim to collect data on an analysis process to find the best social sustainability criteria within the company MANIFATTURE SIGARO TOSCANO and will give the experimental character to the thesis by providing solutions from the measurement of social sustainability using the BWM method. Finally,

the last chapter will draw conclusions and highlight the limitations of the work, suggesting directions for future research.

This work not only contributes to the growing literature on social SSCM, but in a more important contribution it attempts to identify a fair way of examining the social indicators that a company must consider in order to be considered socially sustainable. This research is very useful for supply chain managers and policy makers to understand different models of social sustainability and, in turn, can serve as a key tool for sustainability decision-making.

The word sustainability is a broad and generic term that touches hundreds of fields from the economic to the environmental and social and with it branches out into hundreds of other subsets extending even in time, just think of intergenerational sustainability that includes future generations. Although the word sustainability is a recent one, considering that it only began to spread and be included in vocabularies all over the world since the 1980s, it is destined to gain more and more importance.

The concept of sustainability was introduced during the first UN conference on the environment in 1972, but only two years later, during the Woodlands Conferences in Houston, Texas the word 'sustainability' for the first time appeared in the United States in the context of development. thus implying for the first time issues such as social development, resource depletion, urbanisation and the deterioration of ecosystems (Kidd, 1992). Today, sustainability is commonly associated with nature and the environment, but its economic and social aspects are often not discussed. (Tavanti and Wilp, 2021) As we have seen, the concept of sustainability has undergone an etymological evolution away from a vision centred on ecological aspects and towards a more global meaning, taking into account not only the environmental dimension but also the economic and social dimensions (“sostenibilità nell’Enciclopedia Treccani,” n.d.).

Sustainability as an interdisciplinary concept was consecrated in 1987 by Gro Harlem Brundtland who drew up 'Our Common Future', a guideline for sustainable development that is still valid today. In the report, the theme of sustainability is linked to the three 'pillars' that make business development and environmental protection compatible: Enviromental, Economic and Social. The meeting of the three sustainable components ideally coincides with the 'sustainable development' constituted by what the British scholar Jhon Elkington called the Triple Bottom Line (1994).

It is outlined as an accounting framework but differs from other reporting frameworks because not all of its elements, think of environmental and social, are easily measurable. Andrew Savitz gives a comprehensive definition of TBL: "it captures the essence of sustainability by measuring the impact of an organisation's activities on the world... including both its profitability and shareholder values and its social, human and environmental capital" (Savitz, 2013).

The Triple Bottom Line can be used as a reference point for projects of different scales and with action boundaries that may vary depending on the geographical area under consideration, we will focus on projects carried out by the manufacturing company and therefore the action boundary is considered small compared to that of a government acting on a national scale. The set of measures that will then be implemented to complete the project will be decided by the stakeholders who will evaluate the data needed to guide the development of a proper TBL. (Slaper and Hall, 2011)

The social dimension is commonly recognised as the 'weakest' pillar of sustainable development due to a lack of analytical and theoretical foundations (Lehtonen, 2004) and the state of development of indicators or measurements of corporate social sustainability is believed to parallel that of environmental performance some 20 years ago (Ranganathan, 1998).

The definition and objectives of social sustainability, as well as the related indicators, are a rather complex topic to illustrate and to which much attention has been paid: a) because of the multi-level, multi-stakeholder and multifaceted nature of the issues addressed, b) because of the interaction with environmental, economic and institutional aspects and, finally, c) because of the precariousness of the models to be used as a reference. (Fantini et al., 2013).For this reason, in the thesis work, an attempt will also be made to extrapolate from the results of the empirical study a sectoral definition of social sustainability that departs from a broader and more generic view of society as a whole.

Littig and Griessler defined social sustainability in relation to work and lifestyle as: 'the freedom to choose, at any stage of life, between different forms of work (mode of work, field of work) or lifestyles, always having the right to autonomy and freedom of choice of work, field of work) or lifestyles, while always having the right to individual social security'. In other words, underlying the definition is an ethical and moral aspect concerning the uniform distribution and provision of opportunities that do not vary according to type of work, social, ethnic or religious background.

The term supply chain nowadays is influenced by concepts such as globalization, which inherently almost always include global economic scenarios, but supply chain activities permeate every aspect of our lives and therefore their ability to impact the natural and social environment is of considerable importance. The globalisation of business has meant that many products are no longer manufactured in domestic markets, but are outsourced and produced in less developed countries, particularly in Asia, and then shipped around the world (David B. Grant et al., 2017). How does a domestic company ensure the sustainability of its global supply chain and keep an eye on potential social implications?

The concept of the supply chain should first be presented in a technical form to promote understanding of its management, in fact: to have meaningful theories of supply chain management, we must have a theory of the supply chain itself (Carter et al., 2015).

Most supply chain definitions are based on the production route of a product from the raw material to the finished product. Thus, highlighting two substantial points: origin and destination. In between we find activities that add value depending on the good produced, but the supply chain extends in an integrated way to the information and financial flow. Benita M. Beamon defines, the Supply Chain as an integrated process in which different business entities (e.g. suppliers, manufacturers, distributors and retailers) work together in an attempt to: (1) acquire raw materials, (2) convert these raw materials into specific end products and (3) deliver these end products to retailers. This chain is traditionally characterised by a forward flow of materials and a backward flow of information" (Beamon, 1998). Carter et al. spoke of a supply chain as a network consisting of nodes and links. More explicitly, we define a node as a firm that is an agent that is able to make decisions and maximise its profit within the parameters in which it operates (e.g. manufacturers, warehouses, transport carriers and financial institutions(Carter et al., 2015).

A link, on the other hand, is explained as the connection between two nodes. Links represent transactions that consist of the flow of materials, information and/or funding between nodes. Building on these concepts, we arrive at the basic premise that: The supply chain is a network, made up of nodes and links and the activities that are carried out within the chain all have the same level of importance because they are all indispensable to the subsistence of the chain itself and have the sole purpose of guaranteeing service. This interdependence between them causes the chain to break down if an activity fails or a supplier does not complete the work for which it is responsible; the effectiveness of the supply chain is the sum of the coordinated work of all the links that form it. (Stevens, 1989) Effective management of the chain in which the company operates is crucial to the success and competitiveness of the company, becoming a real driver for success in a changing market (Barla, 2022).

The various general processes throughout the supply chain encompassing the supply of materials and sub-assemblies, manufacturing and assembly, warehousing and stock monitoring, order management, distribution and shipment to the customer as well as the management of the information systems required to control all these activities.

The definition of supply chain seems to be more common among authors than the definition of supply chain management (Cooper and Ellram, 1993), but the term supply chain can also refer to the more managerial aspects of the supply chain. In this case, it would be more appropriate to use the term supply chain management (SCM), which refers to the coordination activities that serve to optimise the individual links in the supply chain. If the supply chain is simply something that exists and is identified with the distribution channels and

phenomena that exist in the business world, SCM requires a managerial effort from the companies that form it and thus emphasises the fact that supply chains exist regardless of whether they are managed or not.

The term Supply Chain Management is best defined by Cooper et al. as "the integration of key business processes, from end-user to original suppliers, that deliver products, services and information that add value to customers and other stakeholders" (Cooper and Ellram, 1993). Definition later expanded by Carter and Rogers who define Sustainable Supply Chain Management (SSCM) as "the strategic and transparent integration and achievement of an organisation's social, environmental and economic objectives in the systemic coordination of key inter-organisational business processes to improve the long-term economic performance of the individual company and its supply chains".(Carter and Rogers, 2008).

The importance of analysing and defining Sustainable Supply Chain Management lies in the increasingly important role that companies play today. In fact, companies are often pillars on which various aspects of the surrounding communities are built, just think of companies that support discretionary activities such as philanthropic donations, health care, child care and educational opportunities, of course with these opportunities also come responsibilities that we will define later in the chapter on Corporate Social Responsibility.

While in general, a company can be said to be sustainable when it integrates ESG factors into its decision-making process, some studies have to be used to define the socially sustainable part. For example, Seuring and Muller, in 2008, analysed the limitations of studies on the subject and came to the conclusion that social aspects are often neglected in sustainable development, which is due to a lack of knowledge of sustainability issues or the misinterpretation of them. In many cases, companies refer to the aforementioned definition of sustainability set out in the Bruntland Commission, but do not understand its application in particular, as the topics dealt with are of a macroeconomic nature.

While recent interest in social sustainability has prompted scholars to question how social sustainability has been considered in the study of supply chain management, little attention has been paid to exploring how the implementation of SSCM practices at the social level can be effectively facilitated and enhanced (Alghababsheh and Gallear, 2021).

Since the dawn of humanity, man has been driven to improve himself, and with the improvements and integration of new industrialisation processes came the so-called industrial revolutions. The first took place in the field of mechanisation, the second through improved use of electricity and the third through widespread digitisation. In a present where scenarios in which products control their own production process are increasingly emerging, the fourth industrial revolution is born.

The first use of the term Industry 4.0 dates back to 2011 when it was presented in Germany at the Hannover Messe by a working group representing the Research Union Economy-Science of the German Ministry of

Education and Research (Culot et al., 2020). The term summarised what had been happening in the world of industry for a few years and the imminent revolution that was about to take place in the world of manufacturing. Although one would expect a clear definition of Industry 4.0, recent research works instead show a clear omission in the conceptualisation of the phenomenon.

Technology had already permeated some areas of society with the advent of computers at the end of the last millennium. Within industries, on the other hand, it is not yet firmly present, but is rising rapidly. Riding on the high capacity and desire for innovation of many companies and in conjunction with the increase in mechanisation and automation, the work process has increasingly become characterised by the use of technical aids to support physical work. In addition, networking and digitisation of produced goods and services have caused digital processes to evolve exponentially leading to increasingly digitised environments. Working environments are undergoing a transition to Industry 4.0 due to the presence of technologies such as simulation or augmented virtual reality.

The process of miniaturisation has resulted in the saving of space, where previously it was used for computers or large machines it is now replaced by much more powerful and physically contained installations. The success of this innovation has led to the efficient development of supply chains that have become faster and longer thanks to automation that has made it possible to track and trace goods in production, in the warehouse or in transit. Significantly increasing production processes in the context of logistics has not only turned industrial production practice on its head (Lasi et al., 2014).

If the term we use to refer to the digital transformation in manufacturing environments is 'Industry 4.0', the entry of Fourth Industrial Revolution technologies in the agrifood sector is 'Agriculture 4.0'. In fact, Agriculture 4.0 refers to the upgrading of traditional production methods and strategies of global agriculture towards an optimised value chain, using a range of emerging technologies that enhance disruptive solutions at all stages of the agricultural production chain. (Silveira et al., 2021)

The implementation of Agriculture 4.0 practices is revolutionising the way we produce and interact. Innovations in agriculture are transforming a world that was permeated by traditionalist practices towards innovation. The purpose of implementing these practices is not only to support the farmer in the activities inherent to cultivation, but to facilitate relationships with all the links in the supply chain so as to generate value for his company and its partners.

Sustainability is linked to corporate social responsibility, as a socially responsible company should ensure that its impact on the natural environment is minimised. Corporate Social Responsibility goes beyond the natural environment to include aspects such as fair trade, good employment practices and appropriate relationships with customers, suppliers and other stakeholders (David B Grant et al., 2017). Some economists have studied

a way to turn these attentions that the company must provide to the social into profit, Drucker (1954) suggests turning social problems into economic opportunities, economic benefits, productive capacity, human competence, well-paid jobs and wealth. Johnson (1971) perceived social responsibility as a way to achieve profit maximisation in the long run.

Nowadays there is more and more competition between companies, this leads managers to make important decisions in order not to lose competitiveness, these decisions in most cases can be the result of a negative trade-off that sees social and environmental responsibilities sidelined. The definition of CSR, mentioned above, should be augmented by adding that a company has the responsibility to make profits but must do so within the legal, ethical and discretionary terms that society expects from a company at any given time (Carroll, 1979).

Grant et al. drew up a hierarchy of responsibilities that a company should follow in order to help give new meaning to CSR. In first place, as mentioned above, is economic responsibility, which is the hierarchical basis on which all other responsibilities rest and which makes companies profitable and allows them to invest earnings in sustainability practices as well. Legal responsibility is the second hierarchy of responsibility. Companies must obey the law because it is society's codification of what is right and wrong. Ethical responsibility is last within this special ranking and deals with the obligation to do what is right and fair and to avoid harm (David B Grant et al., 2017).

Companies need to incorporate all these types of responsibilities to achieve model results and avoid falling into unethical behaviour, and to this end many commercial and non-commercial organisations and industry associations have developed some very good CSR attitudes. A step that is slowly becoming more and more important and in some cases indispensable is the evaluation practices performed by a 'focal company' on its suppliers to assess their actual socially sustainable footprint (Dyer and Singh, 1998). We find an example in codes of conduct (COD) or codes of ethics (COE). The code of conduct sets out the company's values in a charter of principles that employees must adhere to in order to mediate interpersonal relationships within the company.

The choice to adhere to these codes is not legally binding, but conditional on the mandatory presence of an internal supervisory body that acquires additional responsibilities. This body has the duty to act as a role model for colleagues, supervise the company's actions, assess the consistency of actions with the codes and as a last resort punish any omissions with sanctions proportionate to the infringement committed.

The internship at Manifatture Sigaro Toscano was a very useful and interesting experience for me, during the period I spent learning about the manufacturing process and the logic of sustainability proposed, I thought it would be useful to apply the described method to a specific real case.

Therefore, data collection and interviews were conducted for the purpose of accumulating data to be later analyzed. Where available, existing rating scales were proposed in order to obtain sustainability criteria as relevant as possible to measurable values (Khokhar et al., 2020).

Several interviews were conducted with employees of Manifatture Sigaro Toscano company. The employees belong to different sectors of the company, namely: Dr.C.Chindemi (Head of Human Resources); Dr.B. Bergantino (head of communication and sustainability project); F.Passerini (head of security sector); Dr. P. Speranza (head of right agricultural policies). The choice to select candidates from different sectors of the company allows us to have an overall view of the procurement process and its sustainability.
What is important to consider from our point of view is that these criteria are actually taken into account; they represent important areas of investment for the company and it is possible that their evaluation will vary over time, depending on the challenges regarding sustainability that the world and the corporate landscape will face in the coming years.

We would like to emphasize how the method is strongly conditioned by the generality of the choice of criteria, the number of possible alternatives, and the manner of evaluation during the process of constructing the vectors. This may be a limitation from the point of view of its applicability in general terms; however, when evaluated in a context similar to our investigation, the method proves to be elastic, providing a good degree of adaptability. For example, different evaluations, designed to construct Best to Worst vectors would produce a reweighted distribution of values, with new peaks as a function of the new scores. Choosing different starting criteria instead, by making other business areas participate within the decision making process, would allow us to assess the impact and extend the concept of sustainability to a wider number of decision makers.

It is our opinion that this class of methods may represent a useful tool for analyzing the impact of business choices in terms of sustainability, to be integrated in the future with the other tools already present; its relevance, tested on a brief case study, appears promising, albeit within the limitations of time and resources proper to this thesis work.
In the future, in order to expand the ranges of possibilities that this type of method offers, it will be possible to select more specific criteria, to increase the number of possibilities, to increase the areas to which these possibilities refer and to proceed with a judicious choice of votes for individual criteria. It is our opinion that in this way it will be possible to obtain comprehensive, truthful picture of the actual decision making process within supply chain management.