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Sustainability performance measurement in food supply chains in Italy: deep diving into social sustainability

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Abstract

Key-words: Performance Measurement; social sustainability; Italian agri-food sector; multiple case study analysis; decision tool; key social indicators; semi-structured interviews.

Social sustainability is one of the least considered when coming to this kind of topic. In particular, assessing a social practice is usually the hardest part since it may not present any metrics or quantitative structure. The aim of this work is therefore to put particular stress on how social sustainability performance measurement is approached in the agri-food Italian scenario, leading to what contingent elements may influence this kind of assessment and the specific criteria to be considered when designing a method or a tool for this purpose. To achieve its goal, this study suggests a multiple case study approach, focusing on 8 companies belonging to the Italian agri-food supply chain sector, with different features and characteristics. The analysis of the indicators identified reveals that companies' approach to sustainability is different, bigger companies have the resources to measure their own performance while smaller ones don't, and instead rely on third-party certificates (e.g. B Corp). Also, a different priority to specific topics shows that several contingent elements influence performance measurements such as the position along the supply chain, the type of product handled and others. As a final contribution, this study proposes a decision tool built to be fast and flexible, that may keep into account some of the contingent elements mentioned and in future applications maybe all of them. This tool is intended to translate the social practices of a company (or a supplier) into a quantitative score that might help the to improve its own performance.

Abstract in Italiano

Parole chiave: misurazione di performance; sostenibilità sociale settore; agro alimentare italiano; analisi di casi multipla; strumento decisionale; indicatori chiave sociali; interviste semi-strutturate.

Quando si parla di sostenibilità, la meno considerata è comunemente la sfera sociale. In particolare, misurare una pratica di stampo sociale è solitamente complicato essendo esente da particolari metriche o approcci quantitativi. Lo scopo di questo lavoro è dunque porre un'attenzione particolare su come le misurazioni di performance di sostenibilità sociale è approcciata nello scenario delle filiere agro-alimentari italiane, giungendo poi a come fattori contingenti possano influenzare questo tipo di valutazione e criteri specifici da considerare quando si sviluppa un metodo od uno strumento volto a questo obiettivo. Per arrivare a ciò, questo lavoro propone un approccio di studio a casi multipli focalizzandosi su 8 compagnie appartenenti al settore agro-alimentare italiano, con caratteristiche e priorità diverse. L'analisi degli indicatori identificati, rivela che l'approccio di tali compagnie alla sostenibilità è diverso, compagnie di dimensioni maggiori hanno le risorse per poter misurare le proprie performance mentre le più piccole non hanno le disponibilità e preferiscono affidarsi a enti terzi certificatori (per es. B Corp). Inoltre, una priorità diversa in argomenti più specifici mostra che ci sono elementi e fattori contingenti che influenzano le misurazioni di performance sociali come la posizione nella filiera, il tipo di prodotto trattato e altri ancora. Come contributo finale, questo studio propone uno strumento decisionale costruito per essere veloce e flessibile, che possa tenere in considerazione alcuni dei fattori contingenti identificati e in un futuro sviluppo probabilmente tutti questi. Questo strumento è inteso essere una traduzione di ciò che un'azienda fa in termini di pratiche sociali (o di un fornitore) in un risultato quantitativo che possa supportare la compagnia stessa a migliorare le proprie performance.

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Introduction

Sustainability, resilience, circularity, decoupling, how many times these words are used nowadays? Why are they considered so important? What is their real meaning? At the beginning of the 70s, humanity started to be concerned about the traditional development model realizing how in the long term it could have caused the collapse of the system. The old belief that Earth, people and money are “unlimited resources” has been abandoned by the most and replaced by a deeper awareness of how we can instead use them while preserving. Therefore, the introduction of the sustainability concept in the society is slowly leading toward greater respect for human beings and the environment and a brighter future for the planet where we live has started to see its progressive rising. Mentioning the famous speech for the United Nations from Brundtland: *“I believe the time has come for higher expectations, for common goals pursued together, for an increased political will to address our common future.”* (Brundtland 1987).

There are many definitions of sustainability since its nature is so complex and broad that tackles many different aspects of reality. The most famous and well-accepted was stated back in 1987 in the famous Brundtland Report as *“meeting the needs of the present without compromising the ability of future generations to meet their own needs”* (Brundtland 1987), putting the focus on equity inter- and intra-generations. Following this idea, a common goal was set first in the Agenda 2015, then in the Agenda 2030, by the United Nations giving 17 main targets to be achieved up to the deadline. These goals, called Sustainable Development Goals (SDGs), tackle the whole palette of possible issues the world is facing and lately some guidelines were added to better understand each problem and its solutions. More in detail, some of the main objectives of Agenda 2030 lead to face economic, environmental and social development concerns, including hunger, poverty, health, justice, peace, water and energy access, climate change, environment and animals’ preservation, work, education and many others. (SDGs 2019) These guidelines are useful to firms, privates and governments to put in action practices that



Figure 1: SDGs logo comprising all the 17 targets. (SDGs 2019)

contribute to the achievements of the 17 targets, e.g., the 1.5°C target aims to prevent the increasing of the world's average temperature up to 1.5°C until 2050 (Garcés, et al. 2019). The global response to warming comprises a transition in land and ecosystem, energy, infrastructures, and industrial systems. The feasibility of adaptation options, and the enabling conditions for strengthening and implementing the systemic changes, are constantly updated.

The food and beverage industry is one of the most influential sectors when it comes to sustainability practices, just to mention some of the most well-known issues there are waste generation, plastic reduction, malnourishment and obesity, animal welfare, emissions, and many others (Mintel 2022). 20 years ago, very few people had the opportunity to access such information, but now globalization offered the possibility to shed light on these issues. For example, the compulsory drawing up of a sustainability report in a food and beverage firm will be introduced in 2024, putting huge stress on this tool by the market on the companies. (Nomisma 2022) Consumers

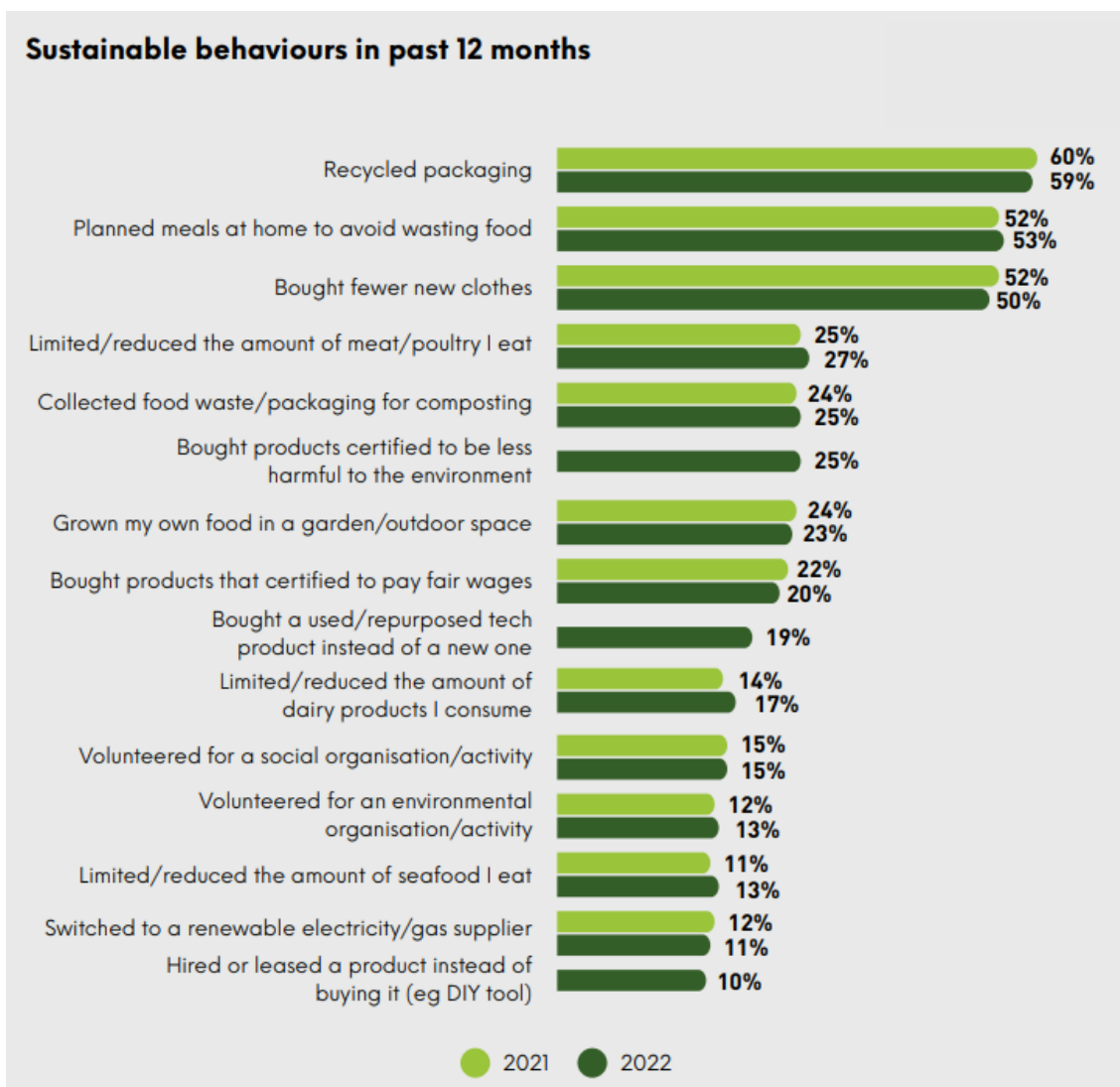


Figure 2: Behaviours of 8000 consumers in the year 2021 -2022. Source: (Mintel 2022)

are giving more and more attention to sustainability matters through their behaviours, pushed by a constant Also, new requirements are arising as trends (or proper shifts) in the daily food and beverages requirements, just mentioning veganism. New raw material supplies must be created along with new supply chain configurations, in order to fulfil the demand, more and more precise (and long-term) forecasts are necessary to create efficient networks, everything along with a great awareness of the challenges the world is facing. (Min, Zachari e Smith 2019) Food organisations and businesses are increasingly making claims about sustainability, promoting alternative food supply-chain models and marketing specific products or individual places. (Ilbery & Maye, 2007) (Watson & Holt, 2008). Many focal companies demonstrate ethical concerns through the adoption and reporting of ethical codes of conduct, labour codes of conduct, or labelling of products that regulate social, environmental or ethical issues. Measuring or benchmarking the sustainability performance of food supply chains can be therefore crucial for governments, businesses and communities. (Yakovleva, Sarkis e Sloan 2010)

Many other reasons might explain the motivation behind this study but what matters the most is a strong belief that a change in how business in the food and beverage industry (and not only) is approached, is of utmost importance in the next few years. The need to push for sustainability practices is rising and the assessment of the performances represents an instrument to constantly track the behaviour and have the awareness of where to intervene. (Yakovleva, Sarkis e Sloan 2010)

The preliminary goal of this work is to map the state of the art of sustainable multi-tier supply chain performance measurement systems in the food and beverage industry. After that, to have a complete view of the performance assessment in a real application, the purpose is to create a semi-quantitative decision tool that can be used to evaluate how social sustainability is handled both in a self-evaluation and supplier-centric perspective. The pathway will follow a mixture of qualitative and quantitative approaches while building a multiple case study framework comprehensive of a set of key performance indicators.

Chapter 1

LITERATURE REVIEW

We conducted a broad work of literature research starting from a preliminary set of 17 articles provided and introducing the context and the state of the art. These documents helped us to understand and to have an overview of the current situation concerning sustainability management approaches in agri-food companies and in the multi-tier supply chain, its assessment, the drivers, barriers and barriers for the assessment and the opportunities that sustainability performances evaluation can bring to a company and its supply chain. This initial step also allowed us to identify the main goals of the study along with useful information about the food sector, and food supply chains. Then, the following step was to enlarge the knowledge of the literature aiming to better refine the final objective of our study.

1.1. Keywords

We conducted this research relying mainly on search engines such as Scopus and Google scholar, considered the most useful platforms for academics. We started by identifying some keywords to find the most relevant papers that may tackle directly (or in the references section) some of the issues we wanted to analyse more in detail. Here is the list of them:

- multi-tier
- multi-stage
- food supply chain
- sustainab*
- performance
- evaluat*
- assessment
- measur*
- capabilit*
- trade-off
- asymmetry information

- resource
- dynam* model*
- power imbalance
- multi-criteria decision

Concerning the choice of these keywords, all the searches contained some of them considered “essential”, in particular, multi-tier (OR Multi-stage) and food supply chain. The reason behind this decision is to filter on Scopus (and Scholar) to consider only a very specific area in the literature and only when we were sure to be in our field of interest, the combination with more particular keywords was performed.

Relying on this set of keywords and using different combinations of more of them we collected a large number of articles also due to the connections in the reference sections. After removing papers that in the end were considered not entirely relevant for our scope and eventual overlaps while keeping only the most concerning ones, we refined the set-up to only 57 crucial articles combined with 17 of the initial literature, for a total of 71.

Particularly useful were the connectors and the filters available in the research engines such as AND (to include both keywords), OR (to put more options for a certain keyword), * (to allow different declinations of the same word), or the presence of the keywords in the abstract/title only along with the whole article or the references. Below is a reported example of the utility of these tools, filtering from 2585 papers to 19 only by adding the TITLE-ABSTRACT-KEYWORD constraint.

2,585 document results



Scopus

ALL (food AND supply AND chain AND multi-tier OR multi-stage AND sustainab*)

19 document results

TITLE-ABS-KEY (food AND supply AND chain AND multi-tier OR multi-stage AND sustainab*)

Figure 3: Scopus search for keywords in two different filter conditions (Extracted from Scopus.com)

1.2. Literature analysis

For analyzing this literature review, a very useful tool we used was a visualization software named VOSviewer which has the main purpose of performing text analytics on a group of articles and classifying the items based on a specific requirement selected (i.e. words repetitions, noun phrase presence, ...). We plotted “noun phrases” (meaning not only a single word but also groups of strictly connected words e.g., SUPPLY + CHAIN = SUPPLY CHAIN is identified as a noun phrase) based on their presence in the set of articles gathered to see how much some topics are tackled. The result is commonly a map where the items are clustered and connected to each other but without showing which article is considered. The clusters are nonetheless a concentration of papers presenting the same feature selected at the beginning, the bigger the cluster, the higher the amount of the same feature found. An example is shown in Figure 4, the majority of the articles had as a common feature the presence of sustainability matters as expected since it was the crucial keyword along with supply chain (another mandatory selection criterion). There are a couple of points that actually highlight interesting observations on the composition of articles gathered:

- “barrier” has a particular impact on the definition of the literature framework. Indeed, it seems to be quite frequent in this type of articles to focus on the barriers of a specific topic whilst not considering the solution or the enablers in this field. This will arise observations in the identification of the literature gaps.
- “dynamic capabilities” and synonyms are connected to all the biggest clusters, leading to show their wide range of applications as Performance Measurement (PM) tools. This is strictly linked to the purpose of this thesis: to identify and assess how is the maturity of PM tools in the food industry.

Also, the other clusters appearing show clearly how the composition of the set of articles is and how are the most important keywords used present throughout the whole set. This map does not show all of the most frequent ones but there are smaller clusters with labels not visible to avoid overlaps, it gives a good picture of the state of the art of our interest. It is also to be pointed out that this text analytics is not as precise as a manual one since it’s automatically done by the software, but for the purpose of this thesis, it’s enough to give a clearer view.

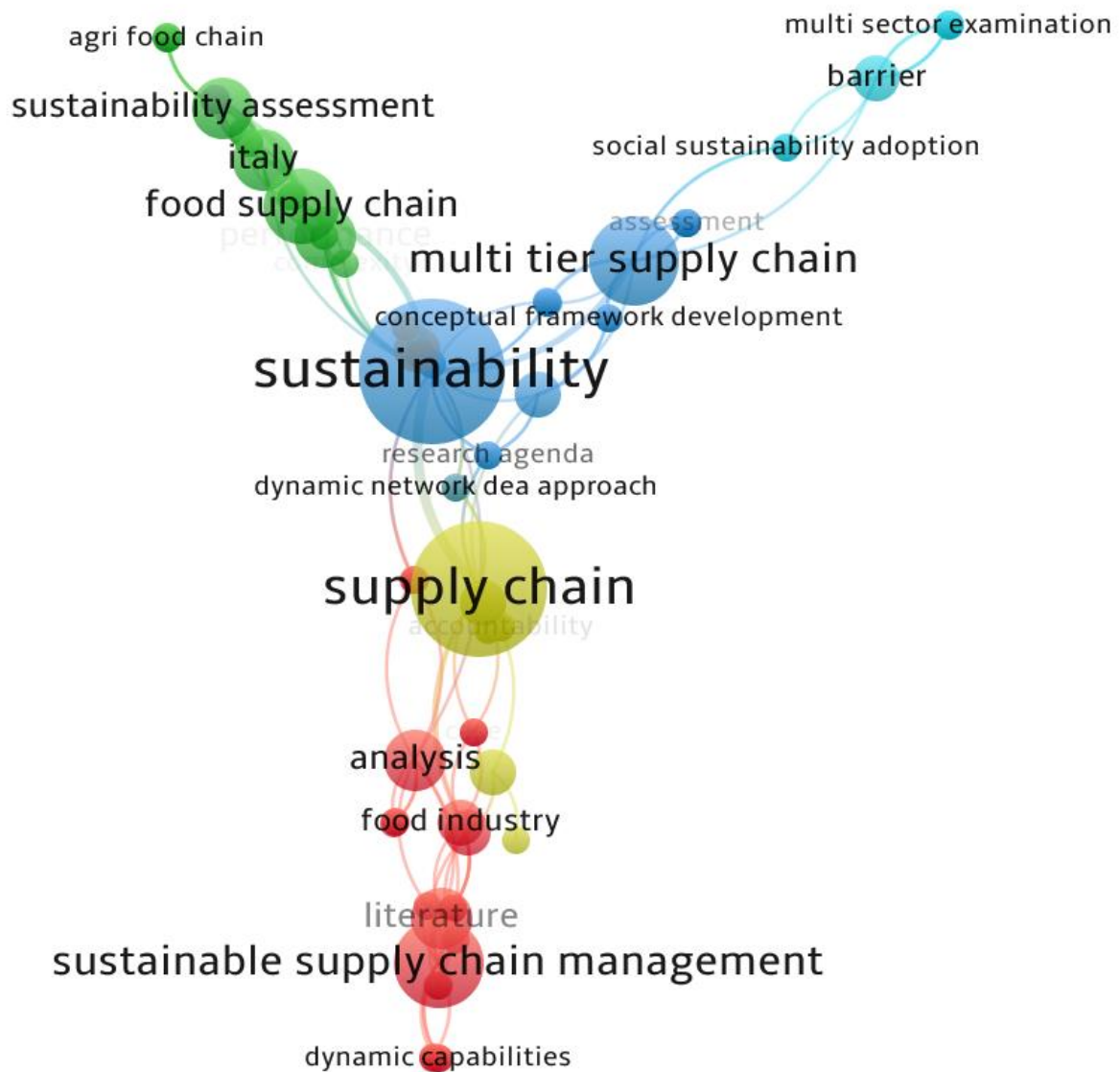


Figure 4: VOSviewer text analytics for noun phrase presence in the articles (created with VOSviewer software).

We ran additional research on the Scopus database to see how, in less than a year, literature concerns about sustainability had changed. The results were quite interesting because keeping the initial string of keywords (*food AND supply AND chain AND performance AND measure* OR assess**) AND *social*, 165 documents were found of which 19 were published in 2022 and 43 total between 2021 and 2022. Thus, around 26% of the documents were published in the last two years. Instead, using the same string but adding AND *environ** 353 documents were found of which 33 were

published in 2022 and a total of 79 were published between 2021 and 2022. In this case, around 22% of the documents were published in the last two years.

These results show how much the environmental aspect is the most addressed one, the publications about this topic are almost double what are those about the social dimension. Moreover, it is possible to understand how much the topic of sustainable PM is a quite recent theme for researchers, with an exponential increase in the number of publications in the last few years. This is likely an addition credit to our choice of addressing this theme.

1.3. Literature review content

1.3.1. Tri-dimensional sustainability

From this initial literature review, it was possible to assess that sustainability in the broadest sense is a relatively young concept in the food supply chains. The majority of these papers indeed had been written in the last twenty years. At the basis of all the articles, there is the idea of sustainability coming from the Triple Bottom Line approach according to which sustainability itself is made of three dimensions namely environmental, economic, and social (Elkington 1997).

According to this theory, these three dimensions are strictly correlated and interdependent: it is impossible to have good results in one sphere without the proper attention to the remaining two. As stated by Usmani et al. the Triple Bottom Line affirms that *“a firm cannot be successful by only doing business, earning a profit, and avoiding the negative consequences on people and planet. Therefore, a mixture of all these elements is necessary to gain a competitive advantage”* (Usmani, et al. 2021).

It is therefore evident how a company and its supply chain should put much effort into all the dimensions mentioned.

Despite the clear interdependence of the sustainability dimensions, most of the papers we selected, dealt with the only environmental sustainability topic. *“The literature*

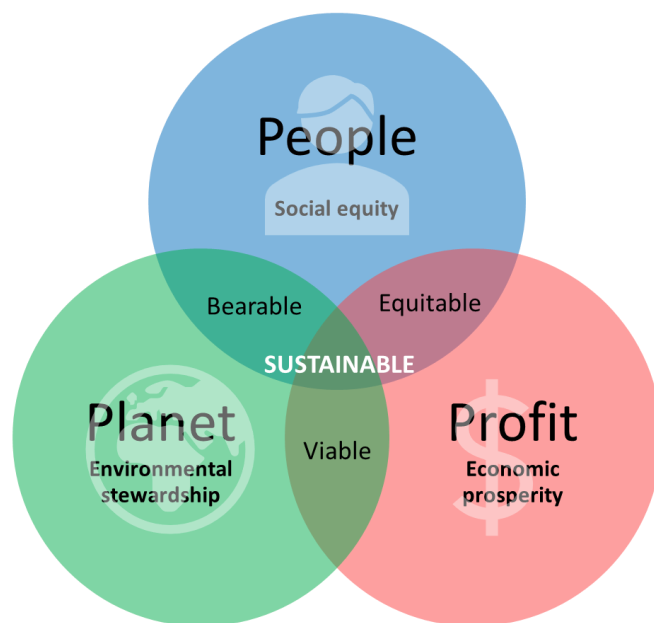


Figure 5: Triple bottom line representation with the three dimensions (3 Ps). Image adapted from (Furukawa 2017).

shows that there is a very strong dominance in addressing the environmental dimension of sustainability in a supply chain. While the environmental aspect of sustainability forms the main foundation in the majority of the modeling approaches identified, it is important to acknowledge that there are a number of publications that address both the environmental and economic dimensions of sustainable supply chain performance. However, very few approaches explicitly address the social dimension of sustainability” (Ahi e Searcy 2013). It is indeed still not clear how social sustainability may contribute to a firm’s profitability. Even dealing with sustainability with a triple-bottom-line approach social dimension usually is still not present in papers (Negri, et al. 2021).

It is easy to think that environmental issues are the ones more closely concerning the consumers. These kinds of problems are tangible in terms of climate change, water scarcity, air pollution, greenhouse gases and others, putting this area under the consumers' spotlight. It follows that implementing sustainable practices and having a system that efficiently allows their assessment and communication to the consumers can guarantee an important reputation improvement for the company eventually resulting in a competitive advantage (León-Bravo, Caniato e Caridi 2018). However, it is not clear how to measure the benefits coming from the implementation of sustainable practices from an economic point of view in a food supply chain.

1.3.1.1. Classification according to TBL

The graph reported below is based on data coming from the number of documents found on Scopus by using the same string for the research changing only the last word: *environ** in the first case, *econom** in the second and *social* in the last. It is possible to notice that not all the sustainability facets have been addressed with the same commitment. Indeed, it is clear how much more effort has been put into the research about the economic and environmental aspects of the food supply chain with respect to the social one. Again, this observation will lead to considerations in further chapters.

1.3.2. (Multi-tier) Supply chain management

From the definition given by Ahi & Searcy (2013) SSCM (sustainable supply chain management) can be described as *“the creation of a coordinated supply chain through the voluntary integration of economic, environmental, and social considerations with key inter-organisational business systems designed to efficiently and effectively manage the material, information, and capital flows associated with the procurement, production, distribution of products or services”* or as stated by Seuring & Müller (2008) *“SSCM comprises the management of material, information, and capital flows as well as cooperation among companies along the supply chain while taking goals of all three dimensions of sustainable development, i.e. economic, environmental, and social, into account which are derived from customer and stakeholder requirement”*. Despite talking about supply chain management, the focus of the majority of the research has been only on the relationships between

focal firms and their first-tier suppliers, without going deeper along the tiers (Tachizawa e Wong 2014).

Nowadays supply chains are made of many different actors belonging to many different supply chain stages. Supply chains are indeed expanding both vertically

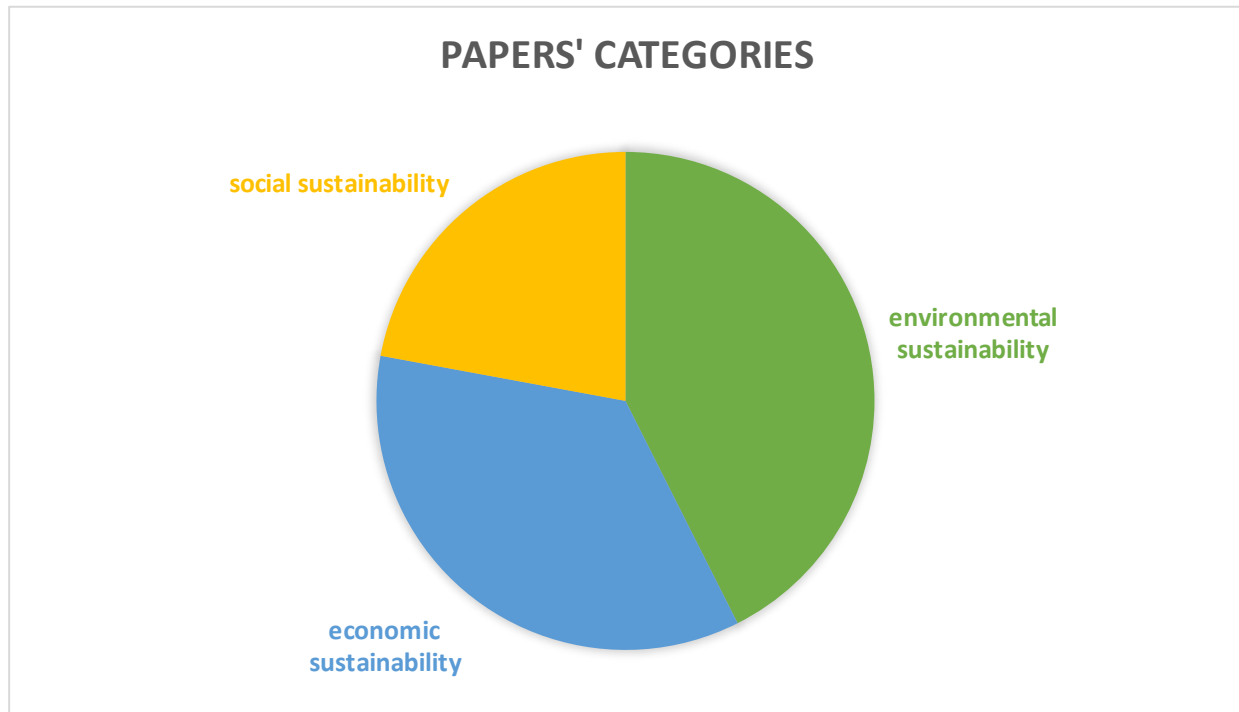


Figure 6: Graph showing the % of papers dealing with social, environmental and economic sustainability (Created with Microsoft Excel)

(increase in the number of tiers) and horizontally (increase in the number of actors per tier) (Sauer e Seuring 2018). Thus, a focal firm cannot claim its products as sustainable without considering the processes (and their economic, social and environmental impacts) of companies in the other stages, especially the upstream of the chain. The first stages of supply chains are indeed reported to be the most impacting on sustainability topics (Sauer e Seuring 2018). Despite this, the final consumer is likely to attribute the responsibility for these unsustainable behaviours not to the small low-tier suppliers but to the focal company itself (Tachizawa e Wong 2014).

Thus, it becomes important for focal companies to be able to have visibility into what happens to their raw materials in the stages prior to their own. In this context, the MTSSCM (multi-tier sustainable supply chain management) concept becomes important, since it "aims to reach deeper into the supply chain" (Sauer e Seuring 2018) extending its influence not only to the first-tier suppliers but to "any lower-tier supplier" (Tachizawa e Wong 2014).

This is not always easy to achieve, indeed, it requires strong relationships along all the chain steps and a strong effort in disclosing and sharing information with the other

actors of the chain. For example, lower-tier suppliers tend to be less prone to sustainability since feeling less pressure from society, usually, the final consumer neither knows them. Moreover, lower-tier suppliers' relationships with the rest of the supply chain are usually unstable (Tachizawa e Wong 2014) because they provide commodities and the focus on those types of products is much more on cost saving than on a specific quality, thus they are quite independent of their buyers.

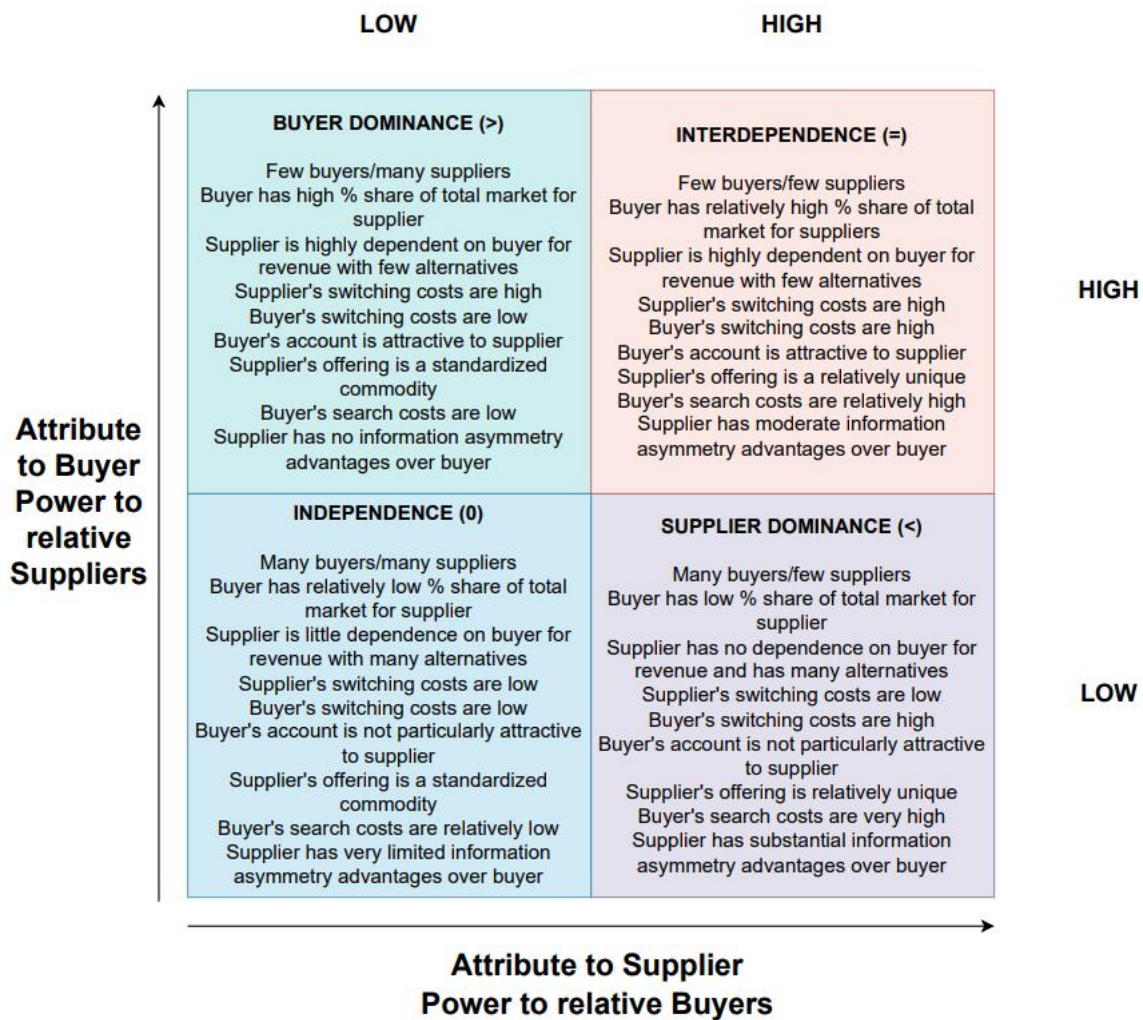


Figure 7: Buyer-Supplier relationship matrix comparing their power.
Image adapted from Cox et al. (2003)

Other factors can hinder sub-suppliers' management reported in the literature such as the lack of direct control and dependence from the focal firm, it also may happen that the direct suppliers of the focal firm are reluctant to share information about sub-suppliers (Grimm, Hofsetter e Sarkis 2014). Other reasons can be a lack of supply chain visibility at the n-th tier (Tachizawa e Wong 2014), cultural and social distance from

sub-suppliers, resource unbalance between the focal firm and sub-suppliers (Tachizawa e Wong 2014) (Grimm, Hofsetter e Sarkis 2014).

Literature highlights two main practices to achieve effective and efficient supplier and sub-supplier management (Grimm, Hofsetter e Sarkis 2014):

- Assessment practices: these allow the firm to evaluate suppliers' sustainability performances
- Collaboration practices: these instead are more related to practices aimed at suppliers' support to improve relationships or practices between buyers and suppliers.

This implies the importance of both measuring and assessing sustainability performances and also helping and supporting suppliers where there is room for improvement.

1.3.3. Performance measurement and sustainability

When coming to SCPMS (supply chain performance measurement systems) context, this topic is already well-established. PMSs are in fact the basis of the business monitoring in a supply chain, and they allow to detect possible strategies for improvement. It is indeed reported that the performance of every firm increasingly depends on the performance of other stakeholders along the supply chain (Maestrini, et al. 2017). For this reason, it is becoming fundamental to keep track not only of the performance of the belonging company but also of the other ones in the supply chain and to take into account a broader range of tasks and competences. Neely, Gregory & Platts (1995) give the following definitions for performance measure and performance measurement system: (Neely, Gregory e Platts 1995)

- *Performance measure* can be defined as a metric used to quantify the efficiency and/or effectiveness of an action
- *Performance measurement system* can be defined as the set of metrics used to quantify both the efficiency and effectiveness of actions

Moreover, usually, literature on PMS assumes that it is a system adopted within a single firm's boundaries. Talking about SCPMS means considering not only a single firm but also the other stakeholders composing that supply chain and their relationships and how they influence each other. Therefore, SCPMSs are made of different components. In a broad manner they can be divided into internal and external SCPMS where: (Maestrini, et al. 2017)

- *Internal SCPMS* focuses on monitoring and controlling the processes that take place within the firm's boundaries
- *External SCPMS* focuses on monitoring and controlling the inter-firm processes and relationships

The latter can be further divided into *supplier SCPMS*, defined as a “set of metrics measuring the efficiency and effectiveness of supplier’s actions and the goodness of the relationship with them”, and *customer SCPMS*, defined as a “set of metrics measuring the efficiency and effectiveness of customers’ actions and the goodness of the relationship with them” (Maestrini, et al. 2017). Consequently, it is clear that different sets of indicators are needed to correctly evaluate the performances of actors in different stages of the same supply chain.

With the introduction of the sustainability concept, PM became even harder to achieve. For example, the need for new and updated indicators arose, since the already existing KPIs, focused only on economics, resulted in being insufficient (Beske-Janssen, Johnson, & Schaltegger, 2015). Indeed, traditional SCPMS are used to assess economic performances and the main indicators taken into account are usually quality, speed, dependability, flexibility and cost. These indicators are not anymore sufficient when it comes to sustainability performance assessment.

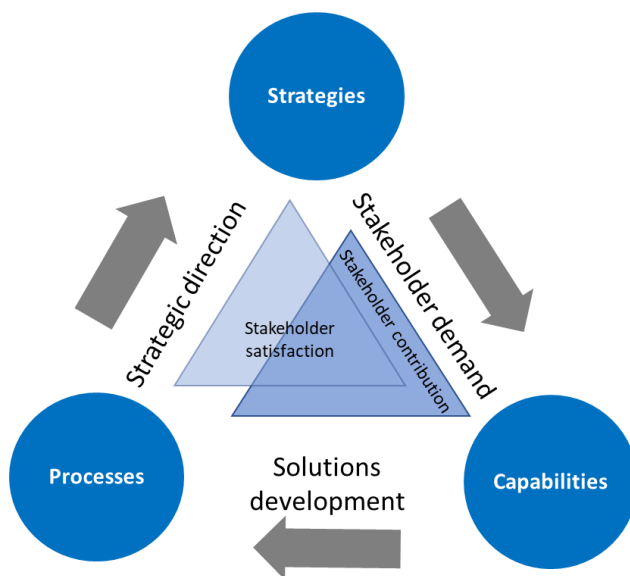


Figure 8: Performance measurement prism from stakeholder-centric point of view. Image adapted from “Performance measurement frameworks: a review”

In the context of sustainable PM and assessment, the environmental one is for sure the most suitable dimension for this goal. It is indeed possible to gain lots of quantitative data regarding the most different topics, just to cite a couple of examples, CO₂ emissions or water depletion. Indeed, it is harder to assess performances regarding an attribute that cannot be easily measured and quantified and that is more qualitative and prone to subjectivity as is the case of social sustainability (Beske-Janssen, Johnson e Schaltegger 2015). In the past few years, many instruments dedicated to environmental performance assessment have been developed, such as the Life Cycle

Assessment (LCA). LCA is an internationally standardized methodology (ISO14040, 2007), it helps to quantify the environmental pressures related to goods and services, the environmental benefits, the trade-offs and areas for achieving improvements taking into account the full lifecycle of a product (European Platform on Life Cycle Assessment (LCA), s.d.). The clear drawback of an LCA technique is its design compatibility only to assess performances in the environmental area, while the social

and economic ones are mainly out of scope. In fact, especially talking about a whole supply chain and considering all three dimensions of sustainability, the literature suggests that *“generic supply chain frameworks might not be the most appropriate tool for analyzing multiple supply chain stages because each stage would have its own needs and objectives, each company would measure its practices differently, and each stage would have different effects on other stages’ performances and reputations”* (León-Bravo, Caniato, & Caridi, 2018). It seems that each different stage of the food supply chain is affected by different contingent factors that make a single PM instrument unfeasible to be applied to all the stakeholders. In such case, an example is the PM prism, in Figure 8, which highlights how important are stakeholders in a supply chain perspective: an important distinction is made between stakeholder satisfaction (what the stakeholders want of the organization) and stakeholder contribution (what the stakeholders contribute to the organization). But as stated by Neely et al. *“Many of the existing measurement frameworks and methodologies appear to stop at this point. Once the strategies have been identified and the right measures established it is assumed that everything will be fine. Yet studies suggest that some 90 per cent of managers fail to implement and deliver their organization’s strategies”* (Neely, Kennerly e Adams 2007).

As for the distribution of the articles among the different topics, also in the PM group, most of the tools are designed to assess performances in only one sustainability dimension, especially in the environmental one. It is still pretty tough to design a method that enables to encompass all three dimensions in a simple and user-friendly way. The main aspect that contributes to the increase in the complexity of designing a holistic sustainable supply chain PM system is that, as already mentioned, all three spheres are strictly correlated. Thus, an improvement in one dimension may imply a conflict with another. For example, the implementation of more sustainable practices requires an increase in investments, creating a trade-off situation.

1.3.4. Buyer-supplier relationship vs multi-tier SC

The majority of the papers analyzed, often times only look at the buyer-supplier relationship. The focus is rarely on more than two different stages of the supply chain and consequently, almost no paper addresses the topic of sustainability PM in the whole supply chain. There are indeed different kinds of barriers that contribute to hindering the implementation of sustainable practices and their measurement within the whole supply chain. First of all, buyers often have little power and influence on their sub-suppliers as they may represent only a small percentage of sub-suppliers’ business. Thus, they may decide not to collaborate and not to share information or data, making therefore impossible the implementation of practices and performance assessments at a supply chain level. There may be indeed a lack of direct control of the focal firm over the sub-suppliers; commonly there is no direct contractual relationship between a focal firm and its sub-suppliers (Grimm, Hofstetter, & Sarkis, 2014). Many

companies just rely on their first-tier supplier for the management of their upstream suppliers; therefore, their performance assessment will not cover more than one stage of the supply chain. Furthermore, sub-suppliers may be less prone to the implementation of sustainable practices in the perspective of keeping their costs as low as possible since they are less exposed to consumer judgements (Tachizawa & Wong, 2014). Also, the management of the relationships with suppliers with respect to sustainability is gaining more and more importance in order to avoid possible negative effects due to scandals related to focal firms' suppliers (Tachizawa e Wong 2014).

Also, the buyer's approach to the relationship with its suppliers can affect the way in which the suppliers themselves approach sustainability issues (Tachizawa e Wong 2014). There are indeed different ways in which lower-tier stakeholders relate to the upstream of the supply chain. In some cases, the focal firm can impose its authority and its power over its suppliers pushing them to standards that are maybe out of their reach, and also use the first-tier suppliers as agents to ensure sustainability in lower tiers (this kind of approach is known in the literature as agency theory) (Aßländer, Roloff e Nayir 2016) (Govindan, Shaw e Majumdar 2020). Often, in this case, suppliers are chosen only considering the ones that can meet the focal firm's standards guaranteeing the lowest costs possible (Govindan, Shaw e Majumdar 2020). In this way, no partnerships are built, and relationships are frequently short-term. On the other hand, focal firms can also relate to their suppliers as a guide, helping and supporting them in reaching common goals and standards. In this case, long-term relationships are preferred; suppliers can be supported during their growth both in terms of knowledge and finance (this kind of approach is explained by the so called stewardship theory) (Aßländer, Roloff e Nayir 2016). Also, in this case, the authority of the focal firm is well defined but not by imposing its power over the upper-tier stakeholders.

Moreover, looking upstream along the supply chain, other kinds of barriers can be related to the lack of instruments to implement or measure the attributes required by the lower tiers' stakeholders (Govindan, Shaw e Majumdar 2020). Often, sustainability practices imply time and money to be invested without an immediate return and this is the reason why many actors are not willing to follow this path. Also, the actors of upstream tiers of the supply chain may be not directly linked with the brand label on the product and consequently are not the centre of eventual scandals (Tachizawa e Wong 2014). This makes them even less prone to put the effort in the sustainability direction, only aiming at offering the lowest possible price for their clients.

A very big source of tension within the supply chain is the price at which the buyer demands to buy products from their suppliers. Indeed, usually, the final customer asks for low-price products, this reflects on buyers that demand their suppliers to reduce costs as much as possible (Govindan, Shaw e Majumdar 2020). Thus, suppliers are usually pushed towards two antithetic paths: on one hand, they are required to

guarantee the lowest price possible for their products; on the other hand, they are required to meet strict and precise standards in terms of sustainable performance. This leads to some tensions due to discrepancies in the incomes of the different stages of the supply chain. Most of the income of the final product ends up in the pockets of the downstream actors, leaving for the first stage stakeholders only the crumbs. In the case of the agri-food supply chain, this burden falls especially on the growers that are requested to comply with high sustainability standards and then they do not see their efforts correctly rewarded.

Chapter 2

RESEARCH GAPS and QUESTIONS

In order to make sure that this study would bring a real output, we have to narrow down the object of the study through the definition of more specific goals. Many authors focus their studies on the same frequent topics, mainly analysing the same issues and barriers to the implementation and measurement of sustainability practices. While on the other hand there are many shaded areas still far from being well explored. A definition of research gaps (RG) and connected research questions (RQ) is necessary to proceed, they not only allow a common language on the premise but also help the reader and ourselves to keep a steady point along the whole analysis.

2.1. Research gap identification

One of the main tangible outcomes of the preliminary literature review is the identification of the RGs. (Elsevier 2022)

It can be defined during academic research as a topic that hasn't been approached yet by any other scientist. Many academics end up, during their professional careers, adapting classic methodologies to a modern context, without finding any useful answer for the progression of science. Another reason to identify RGs is the presence of obsolete data on a specific topic that has the urge to be updated with new contexts. RGs are particularly useful for the advance of science, in general. Finding a RG and having the tools to develop a complete and sustained study on it, can be very rewarding for the academic community, not to mention how its new findings can positively impact the whole society. These concepts are usually applied in the building

of a scientific paper but the same means can find application in a thesis project developed in the academic environment. (Elsevier 2022)

The expression “literature gap” is used with the same intention as “research gap.” When there is a gap in the research itself, there will also naturally be a gap in the literature. This thesis has not the self-conceit to give a large contribution to the academic community but still presents a problem that is derived from a gap in the literature; in this sense, the preliminary literature review helped us not only to



Figure 9: Graphic that summarizes the general purpose of the Research Gaps. (image taken from (Jain e Chetty 2021))

understand the current framework but also to determine the gaps and possible solutions to fill them. (Elsevier 2022)

2.2. Research gaps in the study

The first aspect that was possible to observe after the preliminary literature review is the scarcity of clear solutions proposed in the papers analyzed for sustainability-related problems. The authors point out to the readers, issues and barriers to sustainability matters without taking into consideration enablers or solutions. This led to some preliminary doubts on how to approach the research of a real gap because it would be easy but at the same time useless to identify it in most of the articles found just highlighting their “lack of solutions”.

A more systematic structure to the articles’ network was implemented in order to distinguish gaps from simple and small lacks connected to their application sphere. The previously explained division of articles into categories was particularly helpful in this sense because allowed us to compare the same type of articles to each other.

Therefore, some initial ideas were brought to the surface allowing the identification of 4 main gaps:

- 1) **Quantitative findings**/conclusions with modelling (or similar) missing in most of the articles. A challenge might be to develop appropriate methods or tools to map sustainable supply chain management by mixing quantitative and qualitative considerations. Qualitative methods have already been studied a lot, the purpose might be to deepen the analysis of quantitative ones.
- 2) Few **social sustainability-based articles** (in MT-SSCM), it is a very recent matter especially in the food sector, how it connects with the other dimensions and why it is not so stressed by the companies.
- 3) Literature investigates the **barriers** to MT-SSCM implementation without focusing on how to overcome these barriers.
- 4) Literature broadly investigates **buyer-supplier relationships** in terms of agency theory which is built on a strong economic basis, while only a few articles concern stewardship theory more oriented to the social sphere. Thus, the topic is only partially studied and may need a deep dive into it.

The final choice resulted to be a more specific focus on the first two gaps since, as previously mentioned, the lack of solutions for sustainability matters and connected enablers is a too broad concept to be investigated (and solved) in such a work. On the other hand, the buyer-supplier relationship can be included in one of the social sustainability-based topics since it's part of this broader concept and will be tackled anyways while studying the second gap.

After the identification of these two main gaps, the next step was to clarify their connection to the topic of the study. From a multi-tier supply chain perspective, this fits particularly well: long supply chains are inclined to issues related to trust in the suppliers and their practices that sometimes might be beyond the focal firm's control leading to big scandals (e.g. Nike, in June 1996, was the centre of a scandal due to a sub-supplier who was using children to produce their soccer balls). Often similar episodes happened in the food industry too, not only regarding employment and suppliers but also on the social responsibilities of consumers. . To make sense of these schemes, for organisations to manage their food supply chains more sustainably, and for consumers to build trust in these supply chains, tools to help audit, assess and control these chains are needed. (Yakovleva, Sarkis e Sloan 2010)

2.3. Research questions definition

A research question (RQ) is the core of the investigation that seeks to respond to a certain inquiry and at the same time helps to draw the path in the research process. It usually follows the definition of the RGs and should be the primary interrogation point of a research. Typically, it determines the methodology and hypothesis guiding all

stages of inquiry, analysis, and reporting. These might also derive from a structured Research designed defined as *“the overall strategy that you choose to integrate the different components of the study in a coherent and logical way, thereby, ensuring you will effectively address the research problem; it constitutes the blueprint for the collection, measurement, and analysis of data.”* (Vaus 2001)

RQs might be classified, depending on the research to be done, as quantitative, qualitative, or a combination of the two. Knowing the type of research to be done, can determine the best type of RQ to use. Doody and Bailey (2016) suggest several common features in the three types of RQs.

2.3.1. Quantitative research questions

Quantitative RQs are specific, they include a population to be studied, variables, and a research design. Research design is typically the coherent and balanced choice in combining the different scenarios and elements of specific research. These elements are framed and defined at the beginning of the study (Berger, 2015). Quantitative RQs also establish a link between the questions and the research design. Moreover, these questions do not foresee a YES/NO response. (Doody e Bailey 2016)

They can be further categorized into three types:

- Descriptive RQs aim to measure the responses of a population to one or more variables while describing variables that the research will measure.
- Comparative RQs aim to highlight the differences between two or more groups for an outcome variable. The researcher can also compare a group where a certain variable is involved and another group where that variable is not present, or both.
- Relationship RQs try to explore trends and interactions between two or more variables. These questions can include both dependent and independent variables.

2.3.2. Qualitative research questions

Qualitative RQs may concern broad areas of research or more specific areas of study. Similarly to quantitative ones, qualitative RQs are linked to research design but unlike their quantitative counterparts, are usually adaptable and more flexible (Fetters, Curry and Creswell 2013). As a result, studies using these questions generally aim to explain or explore certain phenomena in detail.

Qualitative RQs can be therefore categorized into a few types too, as reported below (Doody e Bailey 2016):

- Descriptive RQs attempt to describe a certain phenomenon.
- Contextual RQs seek to describe the nature of something that already exists.

- Evaluative RQs assess the effectiveness of existing already methods or paradigms.
- Explanatory RQs seek to present a phenomenon or examine reasons for and associations with others.
- Exploratory RQs investigate areas of a particular topic where there's a lack of data or knowledge.
- Generative RQs try to provide new ideas for the development of theories.
- Emancipatory RQs aim to produce knowledge that leads to engagement in social actions, usually for the benefit of disadvantaged people.
- Ideological RQs are used in research that aims to advance specific ideologies of a position.

2.3.3. Mixed-methods studies

Mixed-methods studies typically require a set of both quantitative and qualitative RQs; these are usually appropriate when the study focuses on the differences and analogies in quantitative and qualitative approaches and not on the study's components. Researchers also have the option to develop a single mixed-methods RQ. This suggests an integrative process or component between the study's quantitative and qualitative methods. (Bouchrika 2022) As stated by Doody & Bailey: *"The development of a mixed methods question should reflect the procedures or the content and not include separate quantitative and qualitative questions. This suggests that there is some integration or linking between the study's quantitative and qualitative phases"* (Doody e Bailey 2016)

2.4. Social sustainability

It was particularly challenging for us to explore the social area which has the most controversial discussions and episodes happening nowadays, it's nonetheless clear what is included or not and what's the priority. A clearer definition of social sustainability has been set in order to keep a common unit of measurement on what will be dealt with throughout the study. This definition is a combination of what we considered more important and what the literature suggested in some of the papers found. Below is reported a sequence of 6 articles from many authors that allowed to set the following basic and academic definition: *Social sustainability can be defined as the sum of actions for internal (e.g. employees) and external (e.g. local communities) actors that a firm put in place to manage social issues making a profit without harming society.*

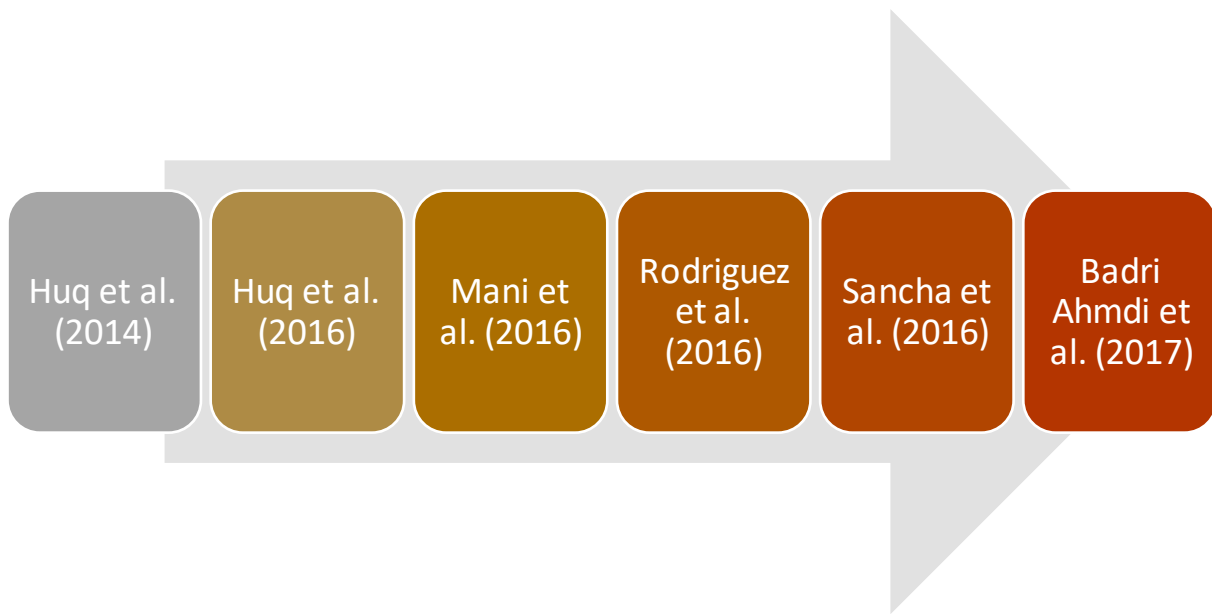


Figure 10: Evolution in time of Social Sustainability definition in literature (created with Microsoft PowerPoint)

Since the literature usually gives the most scientific and objective point of view possible, a cross-check with some famous websites and editorials was done to report also the social community's version:

"Social sustainability occurs when the formal and informal processes, systems, structures and relationships actively support the capacity of current and future generations to create healthy and liveable communities. Socially sustainable communities are equitable, diverse, connected and democratic and provide a good quality of life". (WACOSS 2022)

"Social sustainability is about identifying and managing business impacts, both positive and negative, on people. The quality of a company's relationships and engagement with its stakeholders is crucial. Directly or indirectly, companies affect what happens to employees, workers in the value chain, customers and local communities, and it is important to manage impacts proactively". (UN Global Compact 2022)

These are just a couple of examples of what is the common vision of social sustainability in the non-academic world and it's not to be excluded also from a consumer's perspective (see Figure 10).

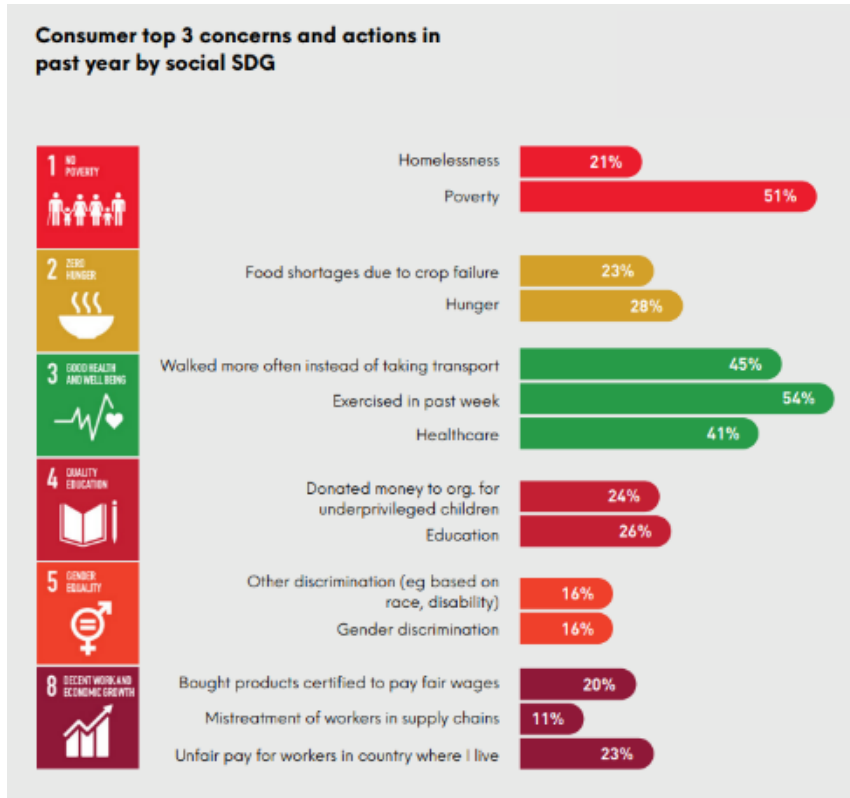


Figure 11: Social concerns of consumers (by SDGs) (Mintel 2022)

In the end, a more inclusive and global definition was finally built also accordingly to the purpose of the thesis, reported in the box below. (Definition created by combining all the citations reported in this paragraph)

Social sustainability should not be an isolated concept, but it has to be defined taking into account also the other dimensions of the TBL (economic and environmental). A socially sustainable SC should make profit without harming the society protecting all the stakeholders, both within and beyond the SC boundaries. It must be a critical part of any business because it affects the quality of a business' relationships with stakeholders since it is a proactive way of managing and identifying business impacts on employees, workers in the value chain, customers, and local communities. We can identify 2 types of communities based on the economic ties: internal and external. Concerning the former, social sustainability aims to ensure safety and health working conditions, hygiene, wages, labour rights, diversity, equity and developing skills and capabilities of current and future generations. Concerning the latter, social sustainability aims at managing social issues by promoting health, support and equal and democratic treatment of the consumers, infrastructure to support social and cultural life, social amenities, systems for citizen engagement, and space for people and places to evolve.

2.5. Sustainability Performance Measurement System

This concept has already been tackled in section 1.4 of the literature review. Measure sustainability is fundamental to truly embed this concept into the decision-making process and the management system, crucial aspects of its operationalization are stakeholder engagement and contextualization. The evaluation can be done through a set of indicators, qualitative or quantitative; no matter what type of sustainability metric is used, its role will be anyhow to help decision-makers to evaluate company sustainability performance and consequently provide information to plan future strategic actions. (Delai e Takahashi 2011)

Leon-Bravo et al. give also a categorization of PM systems based on their specific characteristics:

- 1) Non-structured assessment methods are used when sustainability practices are assessed somehow but are related to a single operative perspective or the data collected is not specifically used for evaluating sustainability.
- 2) Structured assessment methods are used when there is a structured PM system that is consolidated in the company with other existing measurement systems. Examples are the Global Reporting Initiative, Life Cycle Assessment (LCA), Codes of conduct and similar.

3) Certifications, i.e. formal performance assessment systems. They establish standard guidelines for all the actors adopting them, internationally recognized and compliance is certified by specialized third parties (Trienekens et al., 2012; Gualandris et al., 2015). Some examples of certification schemes in the food industry can be the British Retail Consortium (BRC), International Featured Standards Food (IFS Food) and Fair Trade International (FTI). (León-Bravo, Caniato e Caridi 2018)

2.6. Research questions in this study

Based on the previously stated RGs (only the 1) and 2) are included from now on) and considering the aforementioned definitions, the aim of the following steps was considered a combination of quantitative and qualitative approaches; thus a set of RQs was built:

RQ1: How is social sustainability assessment approached in food companies?

RQ1.1: What type of social sustainability practices does a company apply?

RQ1.2: Are these social practices assessed? If not, why? If yes, how?

RQ2: How do the following contingent elements influence the implementation of social sustainability assessment? Stakeholder, supply chain stage, geographical area, size of the company, type of product.

RQ3: What are the criteria for designing a Social Sustainability Performance Measurement System?

The proposed RQs find their location in a mixed-method study: for the quantitative category, as mentioned previously, their answer is not only “YES/NO” but gives space to descriptive explanations. Therefore, the comparative branch seems to be the most suitable since the analysis foresees multiple steps and companies to be taken into account for the case study collection. On the qualitative side, the best category that fits into the set of questions is the exploratory one since the main logical purpose of the study (and the connected gaps identified) is to provide additional data on unexplored topics.

These 3 RQs (and connected sub-questions) are the output of a cross-comparison between the initial literature review and the RGs identified, with continuous refining during the study in order to keep updated the main logical thread with new considerations. They must follow a specific order: first of all, we need to assess IF the companies are already considering the social sustainability area as crucial in their agenda; then we can consider the investigation of PM as a consistent tool in their strategy; finally, we can go deeper considering the possibility of having contingent factors influencing the eventual assessment.

Chapter 3

METHODOLOGY

The most important part of a study is to keep a solid and coherent method throughout the whole process to bring a significant result to the literature. (Garg 2016) First of all, since the purpose is to expand the horizons in an unexplored piece of literature, the approach is to gather data that can successfully fill the gaps whilst identifying analogies with other topics. To do that, the first decision to be taken is which type of methodology has to be used. Considering the kind of gaps and questions identified, the best option results is the usage of a mixture of qualitative and quantitative methodology, supported by the choices made in the previous chapter regarding the gaps and the research questions. For the qualitative part, a case study approach will be used, while the quantitative one will be the creation and implementation of a decision tool based on the output of the first part of the study.

More specifically, defining a methodology means first identifying the unit of analysis, and then selecting the case (or cases) to include in the process.

After shedding light on what it means to perform qualitative research as opposed to quantitative one, it is time to understand what a case study is, what the different kinds of case studies are and what steps should be followed when performing it. (Ghezzi 2022)

3.1. Methodology selection: multiple case studies

A case study, in general, is *“the most flexible of all research designs, allowing the researcher to retain the holistic characteristics of real-life events while investigating empirical events”* (Schell 1992).

According to Yin’s book *“Case Study Research: Design and Methods”* which was published in 1984 but still considered fundamental for all researchers adopting this qualitative methodology, a case study is *“an empirical inquiry that investigates a contemporary phenomenon within its real-life context: when the boundaries between phenomenon and context are not evident; and in which multiple sources of evidence are used”* (R. K. Yin 1984). This definition includes all the essential elements case studies deal with: they are applied to study complex phenomena to be observed in the field; and they should imply an investigation or *“inquiry”* where the informant’s declarations must be confirmed or disconfirmed through the use of both primary and secondary sources of evidence, which make for the so-called *“data triangulation”*.

The unit of analysis defines what the case is or identifies where the phenomenon investigated is located, and what will be the main object under observation. As a unit of analysis, case studies can consider individuals or whole organizations, or even social programs, processes, or changes. (Ghezzi 2022) (Eisenhardt 1989)

Case study research differs from other qualitative research methods, like qualitative surveys or action research methods, in terms of several features: (Ghezzi 2022)

- 1) The number of organizations - ranges from 1 to 100 or more, differentiating case studies from in-depth studies or qualitative surveys. A case study typically includes 1 to 10 different entities analyzed, depending on whether the case is single or multiple.
- 2) The researcher's position towards the subject - whether it involves participating in changing events or mere observation. Case studies, contrarily to action research, imply an observing role without direct intervention which modifies the settings of the case itself.
- 3) The main source of data and information, such as interviews, documents, and websites (or surrounding environment) - a case study's main source of evidence is traditionally represented by interviews.
- 4) The depth of information - single case studies could involve 10 to 80 interviews for each case, whereas qualitative phone surveys involve 1 phone interview for each case.

In order to enable comparisons between the results with other similar studies (or allow others to compare their results with ours, so making the study's replication, a key element for the scientific method), we will try to select a unit of analysis that can be used also by others. The first decision to make concerns whether your research will be based on a single case study or a multiple case study. In a single case study, the focus of RQs is typically on a single context, which can be an individual, a process or an organization. Instead, in a multiple case study, the research will include more than one context to be analyzed and compared. (R. K. Yin 1984)

The multiple case studies approach consists of analyzing a set of real cases chosen in order to collect data that may support (or disprove) the thesis with the unique goal of filling the RGs proposed through the answering of the RQs. The researcher gets into the field and gathers the observations, analyzing them through non-mathematical or non-statistical methods. Case studies are viewed to be appropriate research tools when there are "how" or "why" research questions, there is little control over behavioural events and there is a focus on contemporary events. A summary of the differences among research strategies is shown in Table 1. (Schell 1992)

Table 1: Differences between several research strategies (table adapted from (Schell 1992))

Relevant situations for different research strategies			
Strategy	Form of the research question	Requires control over behavioural events?	Focus on contemporary events?
EXPERIMENT	How, why	Yes	Yes
SURVEY	who, what, where, how many, how much	No	Yes
ARCHIVAL ANALYSIS	Who, what, where, how many, how much	No	Yes/No
HISTORY	How, why	No	No
CASE STUDY	How, why	No	Yes

Three different types of case studies can be identified (R. K. Yin 1984):

- a) A descriptive case study portrays an accurate profile of a person, situation, or process. Previous theories help in identifying the variables in play described (i.e. a good question behind a descriptive case study could be how to describe the sustainability plan of a company)
- b) An explanatory case study explores the reflection of theories and hypotheses in the case, to contribute to the theory (i.e. an explanatory case might address how to effectively perform a sustainability plan, based on the theoretical assumption that practices connected to sustainability may impact the company's profit)
- c) An exploratory case study can be applied any time a given phenomenon is new and mostly unexplored, and there's a lack of theories to formulate hypotheses before the investigation. Therefore, a case where the phenomenon of interest can be observed is selected, and fieldwork and data collection are undertaken before the final definition of study questions and hypotheses since the major features of the case are uncertain.

In any of the types, conducting a case study requires following several steps: setting the problem, defining objectives, framing the analysis in already existing theories, defining the methodology (which is further divided into the sub-steps: deciding the unit(s) of analysis, selecting cases, collecting data and analyzing data, interpreting the

findings) and the concluding step of evaluating the case study and assessing the role of theory (R. K. Yin 1984). The objective indeed is to follow an appropriate research approach in order to describe and explore new phenomena or eventually to build new theories. (Caniato, et al. 2012)

In the following chapter, a more precise and critical justification will be given for the choice of this kind of methodology, highlighting both advantages and challenges.

3.2. Methodology justification

In our study, we decided to keep a mixed method approach given the relevance of Social Sustainability in the gaps (and research questions) that will lead to the need for qualitative-oriented observations supported by text analytics. Whereas the choice of analysing PM Tools will be the gap leading to considering quantitative matters too. Hence, a mix of the two ways will be from now on considered in this research.

There must be highlighted several advantages in the adoption of the multiple case study approach:

- The possibility to perform more than one analysis allows for keeping a wider variety in the choice of the type of analysis itself. In general, as stated by J. Gustafsson, *“the writer is able to analyse the data within each situation and across different situations. The writer studies multiple cases to understand the similarities and differences between the cases and therefore can provide the literature with important influences from its differences and similarities”* (Gustafsson 2017). It is possible, in our case, to perform a comparison in the same step of the supply chain through the different cases (horizontal integration) or instead compare the whole chains among them (vertical integration)
- Taking into consideration many cases can improve the precision of the output, our set of cases will be composed of 8, still, a too small number to be considered statistical but enough to provide a sufficiently complete framework. The choice of 8 cases only might seem a too small number but our aim is not to map the entire supply chain PM scenario (in this case only the Italian scenario) but instead to have one (or a couple of) samples on each step of a supply chain
- Other benefits are that the evidence generated from a multiple case study is strong and reliable and the writer can clarify if the findings from the results are valuable or not. It also allows a wider discovery of theoretical evolution and RQs
- To cite again J. Gustafsson, *“An all-embracing fact is that the evidence created from a multiple case study is measured strong and reliable”* (Gustafsson 2017)

The multiple case study approach presents some limitations and challenges too:

- It might increase the complexity of the analysis and the amount of time and information needed, for our case, there's no financial issue because we are conducting a quite small-scale analysis without involving big actors and databases, but often this approach is very expensive.
- There must be paid attention to the possibility of "outliers" cases that may be hidden in a multiple case study choice. A single case study approach may give a better output because of the high focus on a single case that is therefore carefully chosen (and eventually replaced)

Our choice can be finally supported by Robert E. Stake where in his book "Multiple Case Study Analysis" he states: "*The benefits of multicase study will be limited if fewer than, say, 4 cases are chosen, or more than 10. Two or three cases do not show enough of the interactivity between programs and their situations, whereas 15 or 30 cases provide more uniqueness of interactivity than the research team and readers can come to understand.*"

3.3. Multiple case studies: Operative steps

Defined the type of methodology to be used, and a roadmap for the next steps we will follow are defined. First of all, we decided on the type of source with which to proceed in the study: (Rabiansky 2003)

- Primary data: refers to information that a researcher gathers directly in the field (first-hand). Can include personal studies, empirical tests, interviews, surveys, statistics, ...
- Secondary data: it refers to information from secondary sources/channels meaning not directly obtained by the researcher himself. This includes published or unpublished works (papers, reports, videos, ...).

Primary analysis is used with original first-hand materials, studies, or records of events that form the basis for subsequent data analysis, interpretation, and explanation. Examples of these primary sources include but are not limited to: qualitative, quantitative, and empirical research studies; surveys or questionnaires; or direct observations and experiences performed by the researcher. Often, the data are collected as part of a prospective study. Primary analyses address a specific set of objectives outlined before the data are collected. The investigator determines the dataset and has control over the variables included in the dataset. The investigator also has some control over the accuracy of the data or at least has knowledge of how accurate the data are so that limitations can be adequately discussed. Secondary data analysis is defined as further analysis of a pre-existing dataset to address a research question or to conduct research with data that was not collected for research purposes. These types of analyses usually uncover aspects of a research study that need further elaboration, either revisiting the research question, hypothesis, or measurements used that may need further exploration. Secondary sources include

materials, studies, or records of events that provide descriptions, explanations, and interpretations of the primary sources. Examples of secondary sources include but are not limited to: editorials, patient charts, surveys, periodicals, review articles, published or reviewed research experiment articles, events, and/or database companies. (Rabiansky 2003)

For the purpose of this study, we considered the two sources both useful since we are carrying out an academic multiple case study approach.

The companies will be selected following several specific constraints:

- 1) Food company: operating directly or indirectly in the food sector
- 2) Multi-tier: must present multiple stages or act in some of them
- 3) Employees: the social-oriented focus implies the presence of employees or direct contact with them. We chose also to stress the agricultural area since the human role is central
- 4) Sustainability office: the interviewee must generally be part of the sustainability plan of the company means being involved in practices/decisions/report drafting/...

3.3.1. Data collection

As primary data source, the choice would be between surveys and interviews with an actor in the supply chain, leading to excluding the former in order to be consistent with the selection of the case study approach. Interviews will be mainly used to tackle some specific topic, driving the interviewee in our field of interest where we can gather data useful for our purpose. The plan is to perform the interviews online through a platform (Microsoft Teams, Webex, ...) with a duration of 45'-60' maximum. The interview will also be recorded (if the interviewee allows it) in order to be transcribed and revised, leading to a final script that will include everything said during the meeting. (see Annex I for a small extract) If the recording is not possible, the output document will be a note of the answers gathered.

As secondary data, the website of the cases chosen will be the main source. More specifically, companies publish reports annually (i.e. the Sustainability Report, the Impact Report etc.) that fit perfectly with the purpose of the study. When possible, we will consider the Sustainability Report but since not all the cases present one, also the Impact reports will be used.

After collecting all the useful data, the analysis phase will start. The approach will be mainly inductive but strictly rigorous. All the files will be kept in the original language (Italian) and format in order not to give space to interpretation and mistakes in the translation; this method is considered by us the most reliable since keeps the most objective possible data analysis. Specific software will be particularly helpful to perform the analysis in a structured way, NVivo (V 20) is able to collect documents of

any kind (pdf, audio, Word, ...) and organize them in the perspective to be further managed. The main feature that this software display is the text analytics function that will be performed in the original language too, taking the name of "Coding". To be more specific, we will connect each indicator with as many sentences as possible that explain in Italian the real meaning of the indicators themselves. This manual coding will be done on 3 interviews and 1 report in order to give the software as many pieces of information as possible to be more precise in the autocoding phase, this strategy allows a solid internal validity and reliability of the final output.

Primary and secondary data for a single company will form a case (i.e. Company #1 interview together with Company #1 Sustainability Report). The usage of both data is crucial for internal validation, the two sources not only complement each other but also ensure a double proof for a certain topic.

3.3.2. Data analysis

The bridge between data as documents and numbers will be text analytics through coding. In the practice, Coding consists in *"identifying segments of meaning in the data and assigning them a code that can be defined as a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data"* (Linneberg e Korsgaard 2019).

Coding requires a considerable amount of time, but it will be important since this process allows us, as stated by Linneberg & Korsgaard (2019), to build an inventory of our data that is the basis of further analysis and considerations.

Linneberg & Korsgaard (2019) reported some advantages of conducting the coding process. Indeed, it is stated that coding allows to:

- *Make data easily accessible*: that is a useful feature in case the research lasts over a long period or in case more than one researcher is working on the same data.
- *Sort and structure the data*: coding indeed allows to structure data such that they are easily comparable, especially in a multiple-case analysis.
- *Ensure transparency*: this is fundamental in ensuring that our findings are credible and trustworthy, and in explaining how the conclusions and takeaways are linked to the data collected.
- *Give voice to one's participants*: this indeed allowed us to understand and evaluate each company's point of view and behaviour

Different approaches are possible when talking about coding data: *inductive coding* and *deductive coding*.

The former is typical of a research where there are no theoretical concepts immediately available in the literature and this helps in fully comprehending the phenomenon being studied. In this case, researchers create codes relying on the data gathered, often using direct phrases and sentences used by the interviewees. In this way, the codes

stay close to the data. Codes coming from this approach are often very precise and narrow (Linneberg e Korsgaard 2019).

The latter implies the definition of codes before doing the coding and then applying these codes to the data gathered. This allows us to focus on the aspect that is reported to be crucial in the literature. In this case, codes are defined starting from the extant literature (Linneberg e Korsgaard 2019).

However, often the most widespread approach is a combination of inductive and deductive coding. This blended approach indeed allows at the start to rely on a strong theoretical basis while then leaving room for a closer inductive exploration of the data (Linneberg e Korsgaard 2019). For the purpose of this study, we will follow this last blended approach.

There are different possibilities when it comes to coding a document: (Nelson, et al. 2021).

- Manual Coding: the documents are read one by one, coding the whole text manually through highlighting and comments.
- Software supervised coding (SML): the software operates on its own but human intervention is possible every time it shows uncertainty. A final revision is usually performed
- Software unsupervised coding: the software is completely free to operate on its own following its algorithms without limitations

These methods are typically aimed at making the process more scientific, reliable, valid, and reproducible. (Nelson, et al. 2021) For the purpose of this study, we decided to opt for the SML, meaning that we give the software all the necessary inputs to work on its own, while at the same time keeping supervision on the final coding.

SML models can be not only successful at replicating the manual coding results overall, but also it was boosting confidence in the reliability of the results, and they also prompted a deeper analysis and understanding of the subject matter.

To support our choice, we can mention Nelson et al. (2021): *“These new computer-assisted methods can effectively complement traditional human approaches to coding complex and multifaceted concepts in the specialized domain of sociology (and related disciplines)”* (Nelson, et al. 2021)

At this point, all the documents will be coded with each specific text analytics. The data gathered from all the files are ready to be further analysed, mainly following two different paths: within-case and cross-case analysis.

The analysis within the case will compare the documents to find patterns or trends and therefore to validate them. Another addition will be the comparison between cases (i.e. Company #1 interview + report with Company #2 and #3 interview + report) that

can highlight analogies or differences given a certain parameter (i.e. compare results based on #employees, net sales or step of competence).

As we already mentioned, the software we use has many different possibilities to display data gathered from coding and observations. In literature, there's a clear distinction between two approaches when coming to multiple cases: within-case analysis and cross-case analysis. (R. K. Yin 1981)

The within-case analysis puts the basis on becoming familiar with each case as a stand-alone entity. This process allows the unique patterns of each case to emerge before investigators push to generalize patterns across cases. (Eisenhardt 1989)

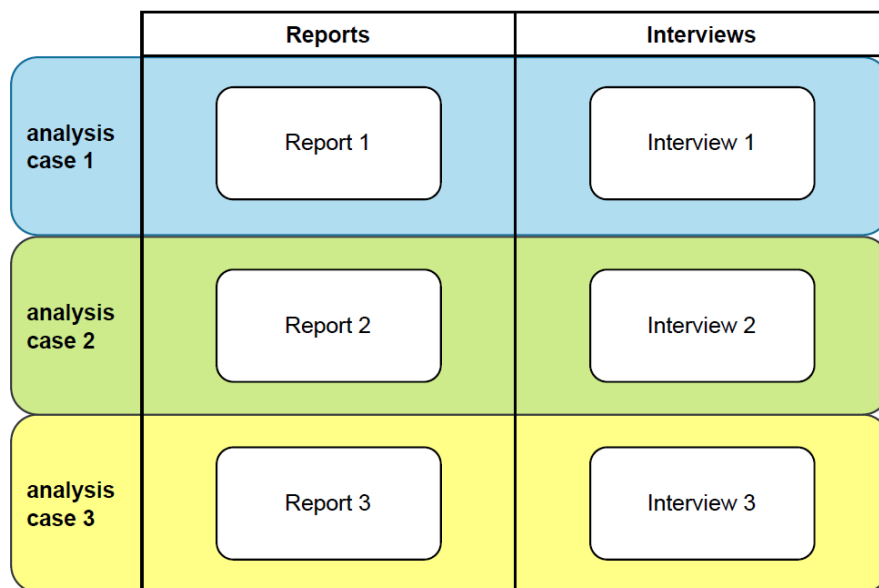


Figure 12: Within-case analysis scheme (created with Draw.io)

In the cross-case analysis, the idea behind this is to force investigators to skip the initial impressions, especially through the use of structured and diverse points of view on the data. These tactics improve the likelihood of an accurate and reliable theory, that is, a theory with a close fit with the data. Also, "cross-case searching tactics enhance the probability that the investigators will capture the novel findings which may exist in the data". (Eisenhardt 1989)

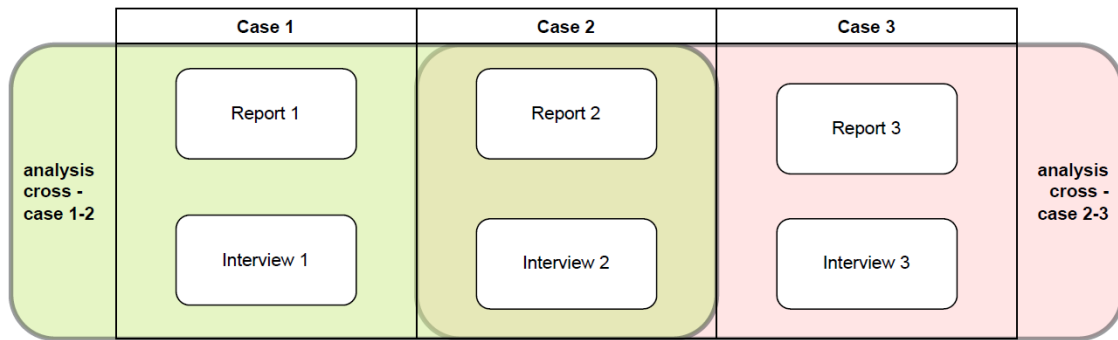


Figure 13: Cross-case analysis scheme (created with Draw.io)

Chapter 4

FRAMEWORK DEVELOPMENT

As mentioned in the previous chapters, when talking about agri-food supply chains there is a lot of concern about the environmental sustainability sphere. Social sustainability instead is still the least addressed topic despite showing as many problems as the environmental one. Thus, based on the research gaps identified in Chapter 2 that are a lack of focus on social sustainability and a lack of clear instruments to be used for its performance assessment, we decided in this work to focus on people and on how agri-food companies and supply chains may take care of them.

In particular, what came out from the literature review is not just a minor focus on this sustainability aspect but moreover a lack of a clear instrument that allows keeping track of companies' social sustainability performances in a clear, simple and objective way. Literature reports some attempts but they are often characterised by a high level of complexity ending up not being user-friendly. An example can be the attempt of Payman Ahy and Cory Searcy in *Assessing sustainability in the supply chain: A triple bottom line approach* (Ahi e Searcy 2013). These researchers try to include social sustainability in a tridimensional framework that aims at assessing the overall sustainability performances of a supply chain taking into account all three sustainability dimensions. The model developed in this paper aims at only assessing progress (or decline) towards sustainability, and not evaluating the as-is situation. Moreover, it is reported that the indicators needed to make this model work are

needed to be available to be used in a probabilistic model, but most of the ones identified in the literature are not prone to that (Ahi e Searcy 2013).

In order to complete this work, it was important to define first of all a set of categories to be addressed for a complete and effective social sustainability performance assessment.

Since social sustainability encompasses different concepts and targets different topics, and as already cited in the social sustainability definition, the main areas of social sustainability will be identified. Firstly, given the importance of ensuring safe and healthy (and hygienic) working conditions, to respect the dignity of workers as human beings in terms of rights, wages, equity and inclusivity. Secondly, the importance of respecting and protecting and where possible giving something back to local communities and consumers with which the companies of a supply chain have to deal with. It is thus important to detail these concepts and organises them into different categories.

4.1. KPIs identification

Conducting a literature check we found that the concepts we wanted to deal with are not far from those addressed by researchers. An important source has been the table by Morais & Barbieri (2019) which reports the different categories of social issues characterising supply chains. They made a list of fourteen different categories to take into account when dealing with social sustainability. These categories and the correspondent description are reported to be:

- *Working conditions: Employees working conditions include low wages, extended working hours, the right to form unions, employment contracts and worker exploitation*
- *Training Education and Personal Skills: It assesses the level of commitment to improve human capital skills and attempts to correlate the intellectual development of human resources and social progress achieved by the company.*
- *Child Labor: It is concerned with work by children under the age of 15 which prevents school attendance and work by children under 18 years of age that is dangerous to physical or mental health.*
- *Human Rights: Rights inherent to all human beings, regardless of nationality, place of residence, sex, national or ethnic origin, colour, religion, language. The right to equal rights, without discrimination, is the core of human rights.*
- *Ethic: Has a team, department or division responsible for ethical compliance in manufacturing facilities; Audits the client's place for strict compliance with the code of ethical conduct; And establishes a set of transparent, comprehensive and rigorous codes of ethical conduct.*

- *Health and Safety: It includes physical and mental health that is directly related to safety and hygiene at work. It also describes hazardous working conditions, which could leave long-term effects on a worker's personal health.*
- *Health and Wellbeing: It periodically audits its suppliers and guarantees the adhesion of the occupational health policy; Ensures the safety of women at customer sites; Ensure the availability of minimum health care in premises in facilities with supplier*
- *Equity: Ensures diversity in vendor locations, ensures strict compliance with gender and non-discrimination policies at customer sites, ensures diversity in the workplace at customer locations, ensures non- discriminatory gender policy at suppliers.*
- *Development of Minorities: Development of minorities is the development of these populations that are considered minorities in terms of population by virtue of their religion, race or ethnicity.*
- *Disabled/Marginalized Inclusion: Groups that are mostly neglected in societies for physical disabilities or those neglected by the government. Population living below the poverty line is considered as marginalized.*
- *Gender: Equal treatment of women and transgender people to meet special needs and equal rights in the workplace.*
- *Product Liability: Integration of consumer health and safety concerns into the product, such as contaminants or other health threats (including special groups) and complaints handling system; Information on product, ingredients, origin, use, potential hazards and side effects, with labeling. Marketing communications, as ethical guidelines for ads.*
- *Involvement With the Community: Direct and indirect financial support, as well as material resources that impacted communities are benefiting from. It focuses on the cultural and educational interactions established with impacted communities, with a view to improving the external social environment around the company.*
- *Philanthropy: It includes practices such as: donations to religious organizations, encouragement for volunteers to volunteer in charitable units and to donate to NGOs that develop society, encourage suppliers in philanthropic activities, conduct health related fields for society involving factory facilities.*

In two different papers dated 2020 and 2021, León-Bravo et al divide the social sustainability dimension into just three categories, namely *Health and safety, Work and Human rights, and Community* (León-Bravo, Caniato e Caridi 2020) (León-Bravo, Moretto e Caniato 2021). Where the first category includes *“Improved product quality, food safety, food security, traceability and transparency. Promotion of healthy lifestyles and local food. Safer warehousing and transportation”*. The second implies *“Better and safer working conditions that result in higher levels of motivation and productivity and less absenteeism. Training, education, advancement. Regular employment, elimination of illegal and child labour, respect of worker rights, gender equality, freedom of association”*. And the last one is *“Donation, collaboration with NGOs, philanthropy, support economic development in local communities, job training, volunteering, childcare”*.

Therefore, we initially hypothesised a set of seven different categories namely:

- *Working conditions and productive employment*: this category, encompasses all the conditions that may determine the respect of peoples' dignity and work-life balance
- *Training, education and personal skills*: encompasses the amount and quality of training and education courses provided to workers in order to enhance and exploit their skills and personal growth.
- *Child labour*: since it can deprive children of their childhood, and that may be harmful to their physical and mental health
- *Health, safety and well-being*: all the conditions that determine physical and mental workers' health
- *Equity and gender*: with this category, strict compliance with non-discrimination policies are expected, the insurance of diversity, and guaranteeing equal treatment and opportunity to both men and women of all origins and ethnicity
- *Product liability*: this category includes respect for customer health and safety. The assurance of proper and truthful information on the label about ingredients, nutritional values, marketing communication and ethical guidelines
- *Involvement with the community and public affairs*: this category deals with all the initiatives in support of the communities with which companies get in touch. These can be direct or indirect financial support, donation of material resources or shedding of information and education

However, for operationalizing the definition of the previous mentioned categories, first, we decided to merge the categories of *Working conditions and productive employment*, *Training, education and personal skills* and *Health, safety and well-being* since they were all related to the specific workers' conditions in the working environment. Moreover, we decided to introduce the new *Human rights* category to collect the *child labour* and the *Equity and gender* categories. At last, we kept two more categories for *Product liability* and for *Involvement with the community and public affairs* considering them two crucial aspects to be tackled separately.

Thereby we obtained a definitive set of four macro-categories, which are:

- Working conditions and well-being
- Human rights
- Product liability
- Involvement with the community and public affairs



Figure 14: Chart to sum-up the indicators' categories (created with Draw.io)

Then for the only *Working conditions and well-being* category, where we could identify the broadest set of indicators, we split it into four more sub-categories that are:

- Working conditions
- Safety
- Extra benefits
- Communication and involvement

For the remaining three, the consequent sub-categories correspond exactly to the category itself.

At this point, we managed to make a list of the KPIs (Key Performance Indicators) we were able to identify as the ones of major interest for this work. Initially, we drafted the first set of indicators that were then refined thanks to the information we gathered through companies' interviews and their sustainability reports. For the preliminary set of indicators, we relied on different sources and the major ones were the SDGs website (United Nations | Department of Economic and Social Affairs | Sustainable Development s.d.). Along with these, many articles in the literature report list indicators (or practices) to measure social sustainability in agri-food companies. For example, León-Bravo et al. (2018) report a list of the practices implemented in different stages of the agri-food supply chain regarding all the different sustainability dimensions. Or again in the book *Environmental assessment and management in the food industry* where in chapter 16 Yakovleva, Sarkis, & Sloan (2010) make a similar list of indicators, where they are divided by supply chain stage and sustainability dimension.

As the last important source for the KPIs, Ahi & Searcy (2015) draw up a list of possible indicators useful to assess the social sustainability performances of supply chains.

The preliminary set of indicators was then refined as will be detailed in the following sections of this chapter.

4.2. Working conditions and well-being

As already stated, the “*Working conditions and well-being*” area is the broadest to be addressed for several reasons. This is related to what we already called an internal community in the definition we gave of social sustainability in Chapter 2 section 2.4. Also, the sustainability of a company and of a whole supply chain passes through its workers' well-being. This is the aspect that the different stakeholders in each stage of the supply chain we considered can directly control.

This category includes the topics related to conditions that determine the physical and psychological health and well-being of the workers, their dignity as people, their right to form trade unions, the guarantee of right employment contracts and workers' exploitation. This category also includes the company's (or supply chain) efforts in the valorisation and personal and professional growth of its employees, the guarantee of workers' right to safety and hygiene, limiting the cases of hazardous and not suitable working conditions that can have detrimental and long-term effects on health. Therefore, in this section, we also included the assessment of the amount and quality of the training provided to workers and the valorisation of their skills. The growth and valorisation of employees should run parallel to the company's growth.

Including so many different aspects four different sub-categories were needed.

4.2.1. Working conditions

The *working conditions* sub-category is specifically related to the respect for a decent legal contract. This is related to the guarantee of the worker's dignity and values of his job and efforts, and his work-life balance.

In this sub-category we included six indicators:

- Assurance of decent wages (Ahi e Searcy 2015) (Govindan, Shaw e Majumdar 2020) (Yakovleva, Sarkis e Sloan 2010)
- Working hours per day (Govindan, Shaw e Majumdar 2020)
- Extra working hours per day (Govindan, Shaw e Majumdar 2020)
- Job security (Govindan, Shaw e Majumdar 2020) (Govindan, Shaw e Majumdar 2020)
- Number of days off available per year (Govindan, Shaw e Majumdar 2020)
- Right of free association (labour unions) (Govindan, Shaw e Majumdar 2020)

4.2.2. Safety

The *safety* sub-category is related to the indicators that can keep track of the workers' safety and health in the workplace. This is related to addressing the company's efforts in order to guarantee its employees' health and reduce as many as possible eventual accidents and limit long-term effects on employees' health.

In this sub-category we included four indicators:

- Number of working accidents per year (Ahi e Searcy 2015)
- Degree of exposition to hazardous substances (Ahi e Searcy 2015) (Govindan, Shaw e Majumdar 2020)
- Maintenance activities (Govindan, Shaw e Majumdar 2020)
- Investments in new technologies and training courses (León-Bravo, Caniato e Caridi 2018) (Govindan, Shaw e Majumdar 2020)

4.2.3. Extra benefits

The *Extra benefits* sub-category is related to all the initiatives that a company put in place in order to enhance its employees' well-being and that is not regulated explicitly by law. This may include many different employee-oriented initiatives that may contribute to workers' happiness and satisfaction and build a strong appeal for the company's image.

In this sub-category we included five indicators:

- Minimum health care (Ahi e Searcy 2015)
- Number of initiatives supporting the development of workers' skills (León-Bravo, Caniato e Caridi 2018)
- Investments in subsidiary equipment for a more human-oriented environment (Ahi e Searcy 2015) (Govindan, Shaw e Majumdar 2020)
- Corporate childcare (Ahi e Searcy 2015)
- Extra refunds (Ahi e Searcy 2015)

4.2.4. Communication and involvement

The *Communication and involvement* sub-category is related to what a company does to make its employees feel like being part of a community with eventually a common goal. This includes the information disclosure to the workers about the company's initiatives and projects that may value their ideas and opinions.

In this sub-category we included three indicators:

- Degree of information sharing about the company's initiatives toward employees (León-Bravo, Caniato e Caridi 2018)
- Initiatives to promote employees' involvement (Govindan, Shaw e Majumdar 2020)

- Presence of anti-corruption practices and/or policies (Govindan, Shaw e Majumdar 2020)

4.3. Human rights

In the *Human rights* category, the objective was not to address topics related to physical health, nor topics related to mental health either of the employees. In this case, the focus was on how the company approach themes such as equity and gender, inclusivity, and respect, and how the company behaves towards its workers.

We considered human rights as the basic rights and freedoms that belong to every person in the world, from birth to death. They must apply regardless of one's nationality, ethnicity, sex, language, religion, and any other peculiarity (Morais e Barbieri 2019). They can never be taken away by anyone, although they can sometimes be restricted for example if someone breaks the law. They are based on shared values like dignity, fairness, equality, respect, and independence (What are human rights? s.d.).

More specifically, this category deals with compliance and non-discrimination policies and ensuring diversity in the workplace. It deals with ensuring equal treatment for women, equal treatment for all kinds of minorities and meeting eventual special needs.

In this case, we identified only one sub-category that indeed is named as its own category.

In the Human rights sub-category we included seven indicators:

- Child workers (Govindan, Shaw e Majumdar 2020) (León-Bravo, Caniato e Caridi 2018)
- Male vs female full-time employment (Govindan, Shaw e Majumdar 2020)
- Average wages for female vs male employees (León-Bravo, Caniato e Caridi 2018)
- Inclusivity for disabled people (Govindan, Shaw e Majumdar 2020)
- Parenthood respect (Govindan, Shaw e Majumdar 2020)
- Non-discriminatory hiring about origin and disability (Govindan, Shaw e Majumdar 2020)
- General harassment (Govindan, Shaw e Majumdar 2020)

4.4. Product liability

Product liability includes integration of consumer health and safety into the product, such as contaminants or other health threats and complaints handling systems, display of information on the product, ingredients, origin, use, potential hazards, and side

effects, with labelling, marketing communications, as ethical guidelines (Morais e Barbieri 2019).

It refers to a manufacturer or seller that is held liable for placing a defective product into the hands of a consumer (Corbett e Rivera 2021). In general terms product liability requires that a product meets the ordinary expectations of the consumer; when a product has an unexpected defect or danger, the product cannot be said to meet the ordinary expectations of the consumer.

The *Product liability* category, tackles the social sustainability aspects in the broader way possible, concerning the final product and all the people that are interested whether they are workers along the supply chain or final consumers. In this sense, it includes other aspects such as the satisfaction of peculiar needs of some minorities, the research for new solutions and innovative solutions both regarding the product itself or its packaging just to cite a couple of examples. Or even the degree of information available to the final consumer in support of some sustainability claim of the company.

Also, in this case, the only sub-category identified took the same name as its own category.

In the Product liability sub-category, we included six indicators:

- Disposition of proper space for information (nutritional value, ingredients, ethical guidelines) on labels (León-Bravo, Caniato e Caridi 2018)
- Inquiries from customers (or withdrawals from the market) (Ahi e Searcy 2015)
- Traceability width and depth (León-Bravo, Caniato e Caridi 2018)
- Presence of certifications (Ahi e Searcy 2015)
- Investments in alternatives such as surrogates, gluten-free and vegan options (León-Bravo, Caniato e Caridi 2018)
- Investments in smart and innovative solutions (León-Bravo, Caniato e Caridi 2018)

4.5. Involvement with the community and public affairs

This category addresses the themes and topics related to what a company does not for its internal community but for people outside the company, that is, what a company can do to support local activities and its homeland, this may include funding, collaboration with NGOs and start-ups that aim to help people in need and many others.

In this category, direct and indirect financial support are included, as well as material resources to help communities. Moreover, we included cultural and educational interactions with local communities, intending to improve the social environment around the company. But this also includes the management of public affairs and the external reputation and image of the company (Morais e Barbieri 2019).

In the *Involvement with the community and public affairs* category we included five indicators:

- Community fundings and support initiatives (Ahi e Searcy 2015) (Govindan, Shaw e Majumdar 2020) (León-Bravo, Caniato e Caridi 2018)
- Investments in social events or sustainable cooperatives/NGOs (Govindan, Shaw e Majumdar 2020) (León-Bravo, Caniato e Caridi 2018)
- Involvement and collaboration with start-ups for food or scrap recovery (León-Bravo, Caniato e Caridi 2018)
- Degree of information disclosure (León-Bravo, Caniato e Caridi 2018)
- Presence of dedicated roles for sustainability practices (Govindan, Shaw e Majumdar 2020)

4.6. From indicators to interviews

The previous sections introduced and analysed the utility of indicators and how they were particularly crucial in this analysis. Indicators alone do not actually bring a useful contribution to answering the RQs but they need to be translated into something applicable to a case study. So, the translation of the indicators into something more practical and understandable for the ones concerned is required. Reminding Figure 14, the 4 main macro categories can already be identified as macro themes, each of the indicators becomes therefore a question or a sentence that tackles the specific subject of interest. Below, Table 2 shows how the indicators were rearranged and provided with an explanation or a similar question.

Table 2 Translation of indicators into questions or themes

	ORIGINAL INDICATOR	EXPLANATION/QUESTION
Working conditions & well-being	Assurance of decent wages	Are the wages suitable to support a good standard of living? Are employees satisfied?
	Working hours per day	Do the daily/weekly working hours ensure a good balance?
	Extra working hours per day	How are the extra working hours considered/retributed?

	Job security	How is the contract with all the employees handled? Are there any recessives
	# of days off available per year	Are days off ensured and respect a productive break from work?
	Free association (labour unions)	How is the labour union situation handled?
Safety	# of working accidents per year	Is the level of accidents acceptable? How are accidents handled?
	Degree of exposition to hazardous substances	Are there hazardous substances? Is the exposition safe and regulated?
	Maintenance activities	Are maintenance activities performed regularly?
	Investments in new technologies and training courses	How much money is invested in training courses and new technologies?
Extra benefits	Minimum health care	Is there health care? Does it satisfy employees?
	# of initiatives supporting the development of workers' skills	Are there initiatives or training courses? Do you see improvement in workers' skills/productivity?
	Investments in subsidiary equipment for the working environment	How is the working environment? Is it suitable for the employees to manage the daily tasks?
	Corporate childcare	Is there a plan for childcare? Is it sufficient?
	Extra refunds	Are refunds available? Is there a welfare plan?

Communication and involvement	Degree of information sharing towards workers about company activities	How is communication handled? Is there a communication channel? How do employees perceive it?
	Initiatives to promote involvement	How is involvement among the employees handled? Are there any initiatives towards it?
	Presence of anti-corruption practices and/or policies	Are there anti-corruption practices? Is there a legal section to monitor it?
Human rights	Child workers along the supply chain	Is there periodical monitoring of child workers along the whole supply chain?
	Male vs female employment full-time labour	What is the % of male and female employees? How is it in the highest positions?
	Average wages of female employees vs average wages of overall workers	Are the wages of male and female employees equal?
	Inclusivity for disabled people	Are there disabled people in the company? Are there facilities for them?
	Parenthood respect	How much time is given to parenthood? For males and females?
	Non-discriminatory hiring about origin and disability	Are the hirings regularly checked in terms of origins or disability of people?
	General harassment	How is harassment in the workplace handled? Do employees give you feedback?

Product Liability	Disposition of space for ethical and health guidelines on the labels	Is there space on labels to properly apply ethical and health guidelines?
	# of inquiries from customers (or retires from the market)	How are enquiries handled? Are they public? Is it an acceptable number?
	Traceability width and depth	Is there a valuable and certified traceability plan? How wide and deep is it?
	Presence of certifications	Are there certifications? Which one? How do they provide additional value?
	Investment in alternatives (such as surrogates, gluten-free, and vegan options)	Do you invest in alternatives for minor sectors like vegan options, gluten-free and surrogates?
	Investment in Smart packaging or innovative solutions	Are there investments in innovative solutions for sustainable packaging?
Involvement with the community and public affair	Community fundings and support initiatives	Are fundings for support initiatives put in place? Do you invest in community initiatives?
	Fundings invested in social events or sustainable cooperatives/NGOs	Are you in collaboration with NGOs or cooperatives? Do you invest in sustainable social events?
	Collaboration with start-ups for food recovery	Are you in collaboration with startups to prevent social issues? Do you invest in them?
	Sustainability monitoring role	Is there an office or a role to monitor sustainability practices?
	Degree of information disclosure	Are there any channels to share information with consumers? How important is it?

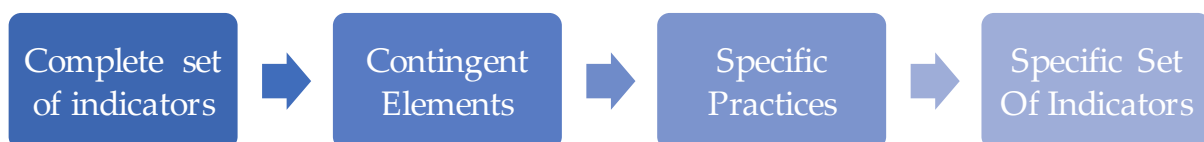
As mentioned, the indicators need to have a practical translation because along the supply chain there might be more than one single meaning; it is not realistic to include directly a question for each one in an interview because it would take too much time and effort for the interviewee to analyse every single practice. The interview therefore will be tackling general topics with precise stress on what arises from the dialogue.

4.7. Contingent factors

It is important to keep in consideration that not all the actors in the supply chain are the same, they may present different needs and do not operate in the same context. It is thus important that the tool will be able to adapt considering different contingent elements that can lead different firms to focus on many sustainability aspects. Indeed, as stated by (León-Bravo, Caniato e Caridi 2018): *“each stage of the Food Supply Chain applies practices with its own peculiarities, all the stages of the supply chain apply some practices in common, while others are specific per stage. Therefore it is important that each stage’s performances are evaluated with its own specific set of indicators.”*

It is not only the stage occupied along the supply chain that determines the specific activities put in place but there may be many other case-specific factors such as different products handled, geographic location, countries and size; small-medium enterprises indeed usually are characterised by a lack of resources in terms of time, human capital and funds (Abbasi 2017). Thus, it will be important that in carrying out an assessment as many contingent variables as possible are taken into account.

Table 3: Steps in the definition of indicators (created with Microsoft Power Point).



Chapter 5

CASE STUDIES SELECTION

As mentioned in the previous chapters, a multiple case studies approach is chosen with the aim to map the social sustainability performance measurement keeping into account the high heterogeneity of the food sector. In Chapter 3.3, several constraints in the choice of the companies to analyse have been pointed out, setting some boundaries in the selection of the best set of cases possible. This choice must be done carefully since it will determine how well this study will manage to picture the

5.1. Companies' selection

The step before conducting the interviews was to come up with a list of possible companies to contact. We decided to narrow it down to select those companies that are present in the Italian food supply chain network and that rely on agriculture or agricultural raw material as well as products rather than companies that rely on breeding and livestock. This choice is due to the fact that, historically, the main social issues along a food supply chain cited by the media and literature arose in the agricultural sector and mainly affect the farmers and in general the lower tiers of the food supply chain. For example, in Italy (but also abroad) the agricultural sector is affected by the so-called *Caporalato*. This is a form of exploitation for the work of the farmers through resorting to the *Caporale* who recruits and manages the workforce illegally. This phenomenon is characterised by exploitation, the lack of job security, the lack of legal contracts and decent wages, by the lack of basic safe conditions. Workers are forced to work up to twelve hours per day in tough climate conditions and usually, they live in slums (People Before Profit - Dalla Protesta Alla Proposta, s.d.). Moreover, it is reported that agriculture represents more than 70% of child labour all over the world. The agriculture sector is one of the most dangerous in which children may end up working. Indeed, they have to deal with dangerous situations like mixing and application of hazardous substances, use of cutting tools and working under the scorching sun or very high temperatures (Unicef - Lavoro minorile in agricoltura: 9 cose da sapere, s.d.).

Additionally, we aimed at including as many supply chain steps as possible and considered small, medium, and big companies in order to have the most complete view possible and to understand how these contingent factors can affect which is the social sustainability focus, the practices implemented, and how they measure their performances. In the end, we came up with a list of fifty-seven companies distributed along the whole supply chain.

5.1.1. B Corp companies & list

A particular note must be given to the B Corp (extended is Benefit Corporation) concept. B Corp is a worldwide recognized certification that is given to companies that aim to have their sustainability performance assessed. The entity managing the certification is called B Lab which is responsible for the B-Impact Assessment (BIA), the questionnaire comprising more than 250 sections in which the company is evaluated. To gain the certification, a company must achieve at least 80 points in the BIA, meaning performing averagely well in many aspects. It is not only an ending point because B Lab asks for improvement actions to be put in place in the following period and also a re-certification every 3 years. This shows how B Corp becomes a movement that keeps into the loop of sustainability improvement a continuously increasing number of companies, stressing the importance to assess their own performance in terms of 5 main pillars (Workers, Environment, Community, Customers and Governance). (B-Lab 2022)



Figure 15: B Corp logo (B-Lab 2022)

The set of cases in this study include companies participating in the B Corp movement that indeed showed to be more responsive and prone to be interviewed (3 out of 8 companies were B Corp and 1 more in the process of being certified).

The final list of companies approached is reported below with the main features useful. For privacy reasons, we don't share the real names of the companies nor give more details about them in order not to make them identifiable.

Table 4: Companies' identity cards with the main characteristics.

Legenda: N.A. = not specified; SC = Supply Chain; s.r.l. = company with quotes but not market share (ltd); s.b. = "società benefit" (business with value); s.p.a. = company quoted in the stock exchange

N°	# Employees	SC step & product	Status	Role	Net sales (M€)
#1	4	Certifications -	s.r.l.	Food Technologist	/
#2	450	Logistics -	s.b.	Sales & Sust. manager	326 (2021)
#3	1473	Logistics-Distribution-	s.b.	Sustainability Office	1070 (2021)

		Packaging (Fruits&Vegetables)			
#4	N.A.	Distribution- Processing- Foodservice	B Corp	Sustainability manager	6 (2020)
#5	N.A.	Distribution- Processing (Dried fruits)	B Corp	Sustainability manager	≈ 50 (2020)
#6	≈ 20 (+externals)	Distribution- Processing (Wine)	B Corp	CSR Manager	6,3 (2020)
#7	>25000	Mainly all SC steps (all kinds of products)	s.p.a.	Sustainability Office	8497 (2021)
#8	130	Processing (Coffee & derivates)	s.p.a.	Sustainability manager	10,5 (2020)

As reported in Table 4, we were able to arrange 8 interviews, one for each different company. Of these 8 companies interviewed, 7 occupy different stages of the supply chain (grower, processor, logistic, retailer/food service) and one instead is a certification company.

A company in the growing stage is however missing, all the firms we talked to are indeed stakeholders of upper stages in the supply chain. Among the eight cases collected, most of the companies comprise more than one stage. Case 7 company for example has operations in all processing, logistics and retailing stage; case 5, case 6 and case 8 are implied mainly in the processing stage; case 2 and case 3 are mainly logistic actors; case 4 is mainly active as a food service actor but has also processing operations; case 1 is a certification company. Moreover, the companies are different in terms of size. Based on their net sales and the number of employees, we can state that belongs to the companies selected, two can be considered big (cases 3 and 7), two medium (cases 2 and 5) and four small (cases 1, 4, 6, and 8). This allowed us also to know if the company size can affect the approach towards sustainability and related practices. Also, not all companies have a department dedicated to sustainability. Indeed, in only three cases the interviewees deal with only sustainability during their workdays, in all the other cases people also work on other topics. In general, the

biggest companies are the ones that are equipped with sustainability or corporate social responsibility department.

5.2. Companies approaching

The first step to start collecting data through interviews is to contact the companies considered suitable for the purpose of the study. Reminding Table 4 in the previous chapter, after having defined the list of companies respecting our set of constraints, we gathered finally 57 companies considered valuable for our purpose both in the field (mainly in the most famous Italian supermarkets) and online. These companies were initially classified by supply chain step (only Growing, Processing, Logistics and Retailing were considered) and by type of company in the following way:

- Processing with retail
- Pure processing
- Restaurants/Selling point
- Fully integrated (tackling almost the whole chain)
- Raw materials/small producers - growers
- Startups
- Multinationals

Some of the companies might also be part of more than one category e.g., a Multinational can be also a Pure processor.

The 57 selected companies were therefore contacted, some of them presented a form in the sustainability section of the website where to put all the information needed, others had a corporate email. The best way was to write a draft of the contact email and then adapt it for each company based on their characteristics. Below it's reported an example in English even if we commonly used the native language of the people contacted, Italian.

Good morning,

We are Alessandro and Edoardo, two students from Politecnico di Milano at the moment attending the last year of Food Engineering, an industrial engineering master's course focused on food supply chains. We are developing a final thesis foreseen by the course focused on the performance measurement of sustainability parameters in multi-tier supply chains in the food sector.

Your reality is strongly configured in this field, therefore we would like to ask you some questions through an interview to complete the data collection of our research. This might be achieved with a brief meeting with someone, in your firm, who deals with sustainability and related projects. Attached, you can find a file with our presentation letter and a brief outline of the topics to be tackled.

We are available for further discussion or clarification and meanwhile, we thank you for your time.

Best Regards,

Milano, 27/05/22

Dipartimento di Ingegneria Industriale**POLITECNICO**
MILANO 1863**Analisi di pratiche sostenibili nel settore alimentare**

Presso il Dipartimento di Food Engineering del Politecnico di Milano, stiamo effettuando una ricerca di tesi sul tema della sostenibilità sociale nella multi-tier supply chain.

Essendo la Vostra una realtà molto significativa nell'ambito del nostro studio, chiediamo la possibilità di svolgere un'intervista mirata ad indagare le vostre iniziative in questo ambito e i meccanismi di gestione e valutazione delle stesse.

Di seguito una sintesi dei temi che vorremmo indagare presso la Vostra azienda:

- Identificazione di driver e motivazioni per l'introduzione di pratiche sostenibili nella vostra supply chain, includendo benefit e trade off
- Eventuale presenza di metodi e strumenti che mirano alla valutazione di performance vostre e dei vostri fornitori riguardo alla sostenibilità
- Focus sulla sostenibilità sociale rispetto alle altre due dimensioni (ambientale ed economica)

- Comparazione delle pratiche sociali nei differenti step della supply chain, considerando criticità in downstream e upstream (a valle o a monte)
- Identificazione di analogie o differenze tra aree geografiche in termini di approccio alla sostenibilità sociale

I dati e le informazioni che vorrete fornirci verranno trattati in modo riservato e nessuna informazione specifica sarà divulgata senza la vostra autorizzazione. Il risultato della ricerca sarà un documento contenente il confronto fra i casi studiati con relativa analisi e concettualizzazione. Tale documento – anonimo – sarà naturalmente a disposizione di tutte le aziende che avranno collaborato con il nostro gruppo di ricerca.

Confidando nella Vostra collaborazione e ringraziandoVi anticipatamente, Vi porgiamo i più distinti saluti.

The 57 companies contacted had a quite low answer rate (only 22 of them answered us) and an even lower positive answer (only 8 were available for further discussion and possible interview). In Figure 15, it is reported the flow of actions performed to get to the interviews.

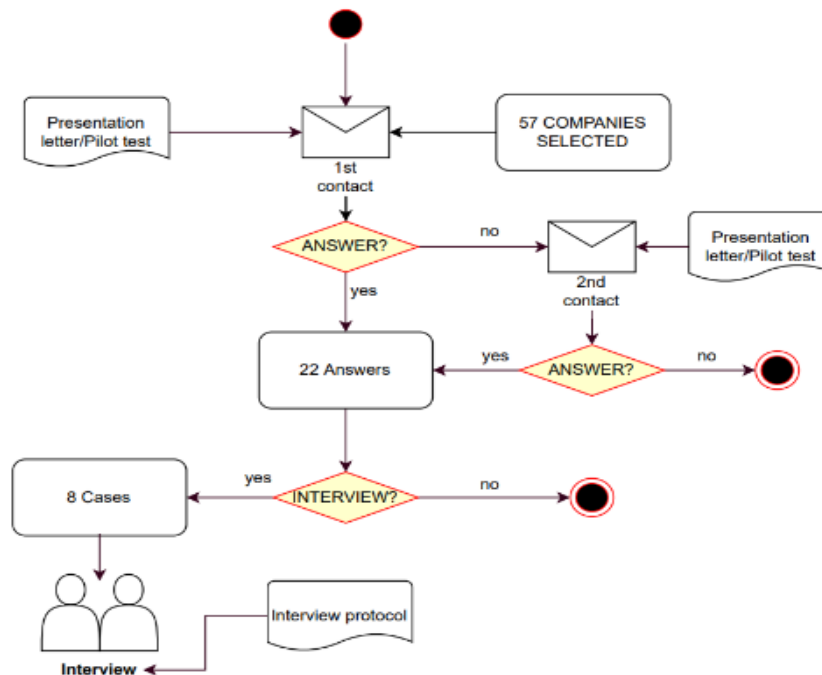


Figure 16: Flow of actions followed to arrive at the interviews (created with Draw.io)

5.2.1. Data collection pilot test

The following step in the methodology is the preparatory phase for the interviews. A pilot test is conducted in any research to ensure that a certain level of validity is obtained. It can be defined as a pre-test version of a research instrument before conducting the actual study, in our case basically a first draft of what the interview should look like in the real application (Gani, Rathakrishnan, & Krishnasamy, 2020). It must be carried out before the interviews and depending on whether the output of this pilot is, the real protocol is adjusted on feedback and opinions. Several authors have highlighted the importance of conducting the pilot test, i.e. it helps to detect any possible flaws at the early stage by identifying potential problems and areas which may require adjustments in the instrument. (Fraser, et al. 2018) Data gathered can be taken into account in the data collection or not based on how well the answers fit into the goal of the collection. To build a pilot test the indicators and their connected applications are used, but also some typical features of a pilot such as an introduction, and some preliminary questions about the interviewee. (Gani, Rathakrishnan, & Krishnasamy, 2020)

The pilot we used is a preliminary version of the interview protocol to refine it in order to gather the information needed without closed or multiple-choice questions whilst promoting the usage of open questions. Below is reported the refined version of the pilot test that was put into action in the first interview.

Good morning, we are Alessandro and Edoardo, students at Politecnico di Milano, attending the MSc in Food Engineering and since we are approaching the end of our studies, we are currently working on our final thesis concerning the evaluation of social sustainability performances in an MT-FSC. For this reason, we would like to ask you some questions about it.

- 1) Do you think it is important to promote sustainability in companies belonging to the FSC?
- 2) How would you define sustainability in your company?
- 3) What would you identify as the benefits of implementing sustainability in your company, if any?
- 4) Are you currently developing any initiatives to promote sustainability?
- 5) Do you have any method for the assessment of your sustainability performances?
- 6) How much do you think is important the social dimension of sustainability compared to the economic and environmental ones?
- 7) Have you implemented any practice specifically in the field of social sustainability?
 - a. Working conditions
 - b. Product liability
 - c. Inclusion and diversity
 - d. Human rights
- 8) Do you monitor or evaluate these practices in any way? Why yes or why not?

Based on our literature review, we noticed that the main problems about social sustainability arise in the first tiers of an FSC, especially in the ones involving farmers and big production factories.

- 9) Would you agree with that?
- 10) Do you think that social sustainability may be a more relevant topic in certain specific product categories independently of the SC stage?
- 11) Do you think that the same can be said about different geographical

Our main purpose was to test if the pilot was unbiased or not, meaning that it should've worked independently from the step of the supply chain considered, the

type of product handled, the role of the interviewee and all the possible variables that in an interview arise.

The interview protocol is the real outline of the interview. It is based on the Pilot but can vary depending on the type of company/the role of the interviewee in the company/other specific factors. As stated in "Accessing Complex Constructs: Refining an Interview Protocol": "*A well-developed interview protocol is an essential data collection tool in qualitative research.*" (Braaten, et al. 2020) meaning that data collection relies entirely on how well the interview protocol is structured.

The first 2 interviews were tested through the pilot protocol and it resulted to be a satisfactory output since the data collected were aligned with the purpose of the case study. Indeed, the questions set in the pilot test allowed us to tackle both macro-themes and indicators, giving the complete palette of useful data. We decided therefore to keep only small adjustments to the pilot test as the interview protocol and to include the data gathered by the first two interviews in the data collection. In general terms, the interview protocol was shared with the companies to be interviewed in advance only in the cases they expressly asked for it.

5.3. Data collection

For the data collection process, we relied on two different data sources. As stated in the methodology, our primary data sources consisted of interviews while our secondary data sources consist of sustainability reports or impact reports of the companies interviewed, if available. The combination of these different types of data allowed us to ensure data triangulation and to have a more complete overview of the themes and topics that we are dealing with.

The pilot interview result was also useful during the entire data collection process since it could be used as a sort of checklist to keep track of the topics faced during the interviews.

It is relevant to explain that there are different ways to structure an interview:

- **Structured interviews:** this consists in a predetermined set of questions that is repeated the same for all the interviewees. Answers to these questions are often closed-ended. This type of interview allows us to easily keep the focus on the main topic but on the other hand with this choice we would risk losing different important insights and data if we don't choose the right questions. As stated by Ali Aslawii "*this type of interview lacks richness and limits the availability of in-depth data. The variation among responses is limited due to the strict interview format that is used. Therefore, the flexibility of the interviewer in terms of being able to interrupt, and the interviewee to elaborate, is restricted. It has been highlighted in the literature that*

this type of interview is suitable for researchers who know exactly what kind of information they are seeking” (Aslawii 2014).

- Unstructured interviews: this is the most flexible kind of interview. There is no predetermined line up and the questions are not prepared in advance. Both the interviewer and the interviewee spontaneously follow the flux of the conversation. In this case, it is harder to keep the focus of the interview on the main topic and answers can be more easily biased by the interviewer. This type of interview would provide a more relaxed atmosphere and may end up with a huge amount of data. (Aslawii 2014)
- Semi-structured interviews: this is a blend of the abovementioned types of interviews. In this case *“the questions are pre-planned prior to the interview but the interviewer gives the interviewee the chance to elaborate and explain particular issues through the use of open-ended questions”* (Aslawii 2014). In this case, the interviewer maintains the possibility to collect other data that can be hindered by his questions. The starting point is always the same set of questions but can adapt to the specific interviewee. This is reported to be a very common choice for social science researchers (Aslawii 2014).

Data collected in this study followed the semi-structured interview approach. This allowed us to follow a common path in all the interviews that resulted from the pilot test as detailed in the previous section. The choice of semi-structured interviews also allowed us to adapt each interview’s questions to the specific companies we were interviewing taking into account the contingent factors, as described in Chapter 4 in section 4.7, affecting each case. Moreover, this choice gave us the chance of gathering as much information as possible from every interviewee since they were free to talk about their company’s sustainability projects and initiatives. Thus, we had more data useful to answer the research questions.

Eight interviews were carried out ranging from 40 to 70 minutes in duration. All the interviews were conducted in Italian since it is the native language of every interviewee. The main channel used to perform the interviews was Microsoft Teams, a platform to carry out online meetings that gives the option to record the video and audio of the meeting. Only one of the companies did not allow us to record for privacy matters; in such case, a detailed set of notes was taken to keep track of the topics tackled. The videos and audios were therefore collected and transcribed automatically in Word files in the original language.

Regarding secondary sources of data, we managed to collect public documents from each company’s website. Only six of the eight companies we interviewed had a report about sustainability performances and initiatives put in place. Collecting and analysing these additional documents allowed us to have a more complete database. Through these documents, it was indeed possible to collect information about all those topics that, for any reason, were not tackled during the interviews or were not clearly

specified. For example, with these secondary sources, we managed to gather information about specific projects and initiatives towards sustainability put in place by the different companies usually many more compared to the ones cited during the interview.

For the companies that draw up that, we managed to collect the respective Sustainability Report. This is a document that companies draw up once per year where they report their measurements, communication and accountability with respect to both internal and external stakeholders about the company's sustainable development performances in the fields of environmental, social and economic sustainability. Thus, A Sustainability Report is a collection of all the initiatives put in place by a company in all the sustainability fields, claiming how well the company behaves and which are its projects that go beyond the company's profit. This document can be useful for all the stakeholders that may interact in any way with the company, they can be both internal and external: employees, suppliers, consumers, media, shareholders, local communities and consumers are just some of the examples. One of the most widespread frameworks used as the standard to draft a sustainability report is that by GRI (Global Reporting Initiative) (Balocco 2021).

Chapter 6

FINDINGS & DISCUSSION

After the data collection, keeping in mind that the output gathered was 8 interviews and 6 sustainability (or impact) reports, the analysis phase started. Mentioning Eisenhardt (1989) "*Analyzing data is the heart of building theory from case studies, but it is both the most difficult and the least codified part of the process*" (Eisenhardt 1989).

The approach that we wanted to give to the analysis of the cases, will be structured text analytics on all the files already revised manually in order to bring out the possible topics and to find a trend or a pattern within and cross-case. Having already an idea and relying on both the research questions and the pilot test built, we finally decided to keep the indicators as single topics along with other more general ones we will talk about in Chapter 7.3.3.

6.1. Transcripts review: data cleaning

After conducting the interviews, the first step was to transcribe them to make it possible for a more in-depth analysis. Indeed, before each interview started, we asked the interviewees for authorisation to record the session. Seven companies out of eight allowed us to record. In the end, we managed to transcribe seven interviews and for the last one, we used all the notes we collected during the meeting.

We split the transcription process into different steps. The first one was to use the “Dictate” Word function while playing along with the interview record for each company. This is just a preliminary step, and the output is not in a linear and correct Italian language, and often results in quite confusing sentences, repetition of words or mistakes possibly due to the overlap of different voices in the recording.

The second step was to read the automatic transcription made by Word and correct the errors. Also, there was the need to highlight the speaker's name at the beginning of a dialogue. Thus, we revised every single transcript making them smoother and correct.

The last step was to add punctuation marks. This is of utmost importance in order to allow the coding software we will present in the next section, to conduct an analysis of the documents as much detailed and precise as possible. In particular, when possible, it was important to substitute commas with full stops, this step will allow the software during the coding to recognize a full sentence and identify a code string.

To be more precise below is reported an example of how the data cleaning was performed, in the first box there is the automatic transcription, and in the second one the same part is cleaned from repetitions and with punctuations.

“...il nostro grande dubbio era proprio proprio quello cioe quando vedi un bicor che ti fa domande molto orientate a sicuramente il modello americano quindi quante persone indigene hai in azienda e la prima cosa che abbiamo in sorridere no perche chiaramente una lista di domande che in Italia neanche applica perché la legge prevede che non ci siano indigeni credo e quindi non ha senso che la chiediamo step due cosa valorizziamo di piu se un'azienda fa volontariato se un'azienda dichiara che poi ha investito nella festa del paese o ci interessa veramente che non ci siano infortuni che ci siano donne all'interno dell'azienda che che che quelle 34 cose che veramente se risolvessimo quelle probabilmente il il mondo starebbe molto meglio...”

INTERVIEWEE: “...Il nostro grande dubbio era proprio quello. Cioè, quando vedi in B Corp che ti fa domande molto orientate a sicuramente il modello americano, quindi per esempio quante persone indigene hai in azienda. La prima cosa che facciamo è sorridere, perché chiaramente c’è una lista di domande che in Italia neanche si applica, perché la legge prevede che non ci siano indigeni credo e quindi non ha senso che la chiediamo. Step due: cosa valorizziamo di più? Se un'azienda fa volontariato? se un'azienda dichiara che poi ha investito nella festa del paese? O ci interessa veramente che non ci siano infortuni, che ci siano donne all'interno dell'azienda. Quelle tre o quattro cose che veramente se risolvessimo probabilmente il mondo starebbe molto meglio...”

It seems that the corrections are just a few, but it is necessary to have perfectly cleaned data in order not to give the software a barrier to auto-coding.

6.2. Coding

Recalling the definitions in Chapter 3.3.2, coding means analysing manually or through the support of software the text of one or more documents in a way that the code strings represent completely in words the code itself. There are different possibilities when starting to code a document: (Nelson, et al. 2021).

Software-supervised coding (SML) is the method considered the most suitable for the purpose of the analysis. To support our choice, we can mention again Nelson et al. (2021): “*These new computer-assisted methods can effectively complement traditional human approaches to coding complex and multifaceted concepts in the specialized domain of sociology (and related disciplines)*” (Nelson, et al. 2021).

All the interviews were carried out in the Italian language, and it has been decided to analyse them in the same language in order to avoid the translation process that may have led to misleading translations due to interpretations or mistakes and biases on the concepts expressed by the interviewees.

N Vivo software was particularly helpful because it presents all the features needed for our purpose: it is a coding software that can perform all 3 types of coding just presented while at the same time displaying the data collected in graphs, flows or diagrams. N Vivo has the possibility to code in different languages but not in Italian language; this led us to consider the translation of the files but since it gives space to interpretations and mistakes, we decided to keep everything in the native language following an alternative approach. The software performs the autocoding with supervision through the connection of key sentences and words that we manually linked to a specific code. This allowed us to use the codes in English while keeping the files in Italian.

Since the N Vivo software does not support the Italian language for the auto-coding process, it was necessary a preliminary step of manual coding. This was needed in order to build a codebook as much complete as possible so that the software could have the necessary instructions and guidelines to carry the automatic coding on the remaining documents we collected. To better understand the process of coding, it might be easier to make an example taken from our manual coding.

Here it is reported the same example of Chapter 7.1 with its connected coding. In the software, it is possible to perform it directly on the file but in order to exemplify the process conducted, the following table is presented: on the left, there is the Italian language extract of the interview and on the right its corresponding code(s).

Table 5: Example of codes connected to sentences in an interview.

SENTENCE	CODE
B Corp che ti fa domande molto orientate a sicuramente il modello americano	B Corp certification
quante persone indigene hai in azienda	Non-discriminatory hiring about origin and disability
Se un'azienda fa volontariato	Community funding and support initiatives Funding invested in social events or sustainable cooperatives/NGOs
Se un'azienda dichiara che poi ha investito nella festa del paese	Community funding and support initiatives
che non ci siano infortuni	# of working accidents per year
che ci siano donne all'interno dell'azienda	Male vs female employment full-time labour
Quelle tre o quattro cose che veramente se risolvessimo probabilmente il mondo starebbe molto meglio	Sustainability importance

We carefully selected the documents on which to do the manual coding in order to be able to cover the highest number of codes possible. We exploited three interviews and one sustainability report. In particular, the interviews of companies #3, #7, and #8 and the sustainability report of company #8. We chose these files because after the data

cleaning they appeared to be the most complete ones and this would lead to covering the highest number of codes possible. There were bigger files possibly to be manually coded (i.e. reports #3 and #7) but the number of pages was too high and not functional for the purpose of this study.

The step of manual coding consisted in attentively reading each passage of the selected documents and trying to assign codes and themes to the related sentences. The assignment was done both for entire sentences that let shine general themes and concepts and for more specific portions of sentences that may be related to more specific themes and, in our case, to sub-categories or indicators. It sometimes happened that in the same sentence or portion of a sentence more than one code has been assigned. For example, this sentence gathered from interview #8:

“...è buonissimo, però vuole sapere da dove arriva quindi c’è trasparenza ma garantita dai player della catena...”

can be connected both to the codes “traceability” and “supplier relationship”. Indeed, translating literally the sentence it is said that the suppliers help the focal company to ensure transparency in the origin of a product, leading to tackling both the codes in a single sentence.

As mentioned, the previous process of manual coding allowed us to build a structured, complete, and various codebook. This is indeed the basis of the next step of autocoding, which would not be possible without the codebook because as already mentioned, N Vivo does not support the Italian language.

The codebook represents the collection of all the sentences and/or the portions of a sentence that, through the four documents manually analysed, were assigned to each of the codes established.

In the end, this represents a manual, translated by N Vivo in a group of criteria in order to have a validated way to conduct the automatic coding of the remaining articles, even if in an unknown language. This will provide the software with the strings, words or entire sentences to be recognised by the software in the different documents to assign the corresponding code or codes.

Our codes are structured in three different levels going from the most general codes to the most narrow and specific ones in the last level. At the first level, we listed all the macro-themes faced during the different interviews, that are:

- *Sustainability Importance*: Every time something is referring to the key role sustainability plays in the SCM, we based this broad concept on all the definitions gathered from the literature.
- *B Corp Certification*: this includes every B Corp invocation and its consequences or requirements.

- *Performance Measurement*: this is related to whether or not companies measure and assess the performances of their sustainability practices and how they do that, by which means they can measure those performances.
- *Quantitative vs Qualitative*: this is related to which indicators (qualitative or quantitative) companies use to measure their sustainability performances and how they use them.
- *Suppliers' relationship*: this code is related to everything that concerns the relationship with suppliers, and how companies manage this kind of relationship.
- *Benefits from sustainability practices*: this code concerns any kind of positive that can derive from the implementation of sustainability practices.
- *Geographical context*: this code is about how geographical context may influence and determine which types of social issues companies may face and which practices companies should put in place to deal with those issues.
- *Social sustainability*: this code relates to anything concerning social sustainability in general. We based the choice of this code on the definition of social sustainability given in Chapter 2.4.
- *Double materiality*: this code represents the fact that sustainability practices do not represent an advantage solely from one sustainability dimension point of view, but they usually affect more dimensions simultaneously.

At the second level, expanding the *Social sustainability* code, we listed the sub-categories presented in Chapter 4 and then in the third level we listed all the indicators presented in the same chapter.

Once completed the codebook and the manual coding of the 4 files selected, it was possible to proceed with the autocoding of the remaining documents collected in the data-gathering stage in the software. In this phase, all we did was select the manually coded documents as a template that the software had to use in the automatic coding and give the software the instruction for our desired output. In the end, we checked the consistency and the coherence of the N Vivo's work before building our observations on the data just gathered, sticking with the choice of keeping a supervised automatic coding.

The software is also able to assist with data analysis through several tools that present many different possibilities:

- Presence of codes in a single or multiple files
- Density of coding a single or multiple files
- Matrix of coding in a single or multiple files
- Words repetitions
- Cases creation and analysis

In the next Chapters, we will use some of them to display in the best way possible our observations.

6.3. Data analysis: Findings

As previously stated in chapter 6.2, the software we used has many different possibilities to display data gathered from coding and observations. In literature, there's a clear distinction between two approaches when coming to multiple cases: within-case analysis and cross-case analysis. (R. K. Yin 1981)

Recalling Chapter 3.3.2, the two approaches selected for the data analysis are:

- The within-case analysis puts the basis on becoming familiar with each case as a stand-alone entity. This process allows the unique patterns of each case to emerge before investigators push to generalize patterns across cases. (Eisenhardt 1989)

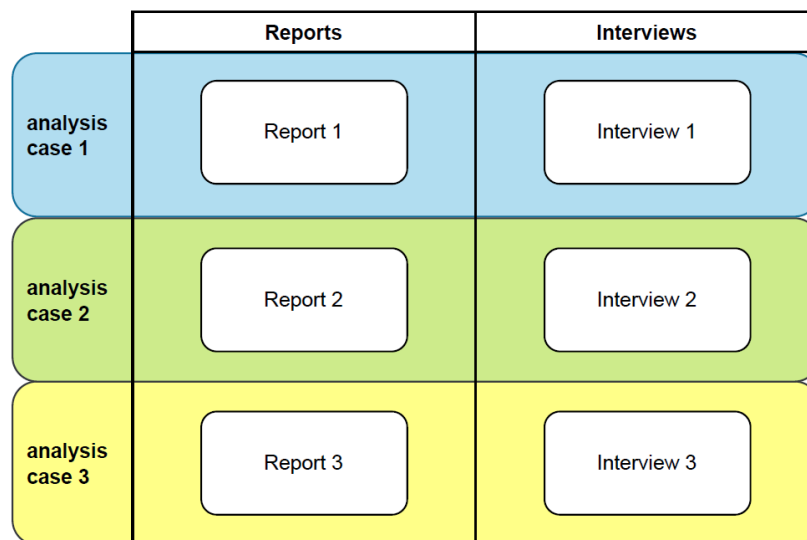


Figure 17: within-case analysis scheme (created with Draw.io)

- The cross-case analysis. The idea behind this is to force investigators to go beyond initial impressions, especially through the use of structured and diverse lenses on the data. These tactics improve the likelihood of an accurate and reliable theory, that is, a theory with a close fit with the data. Also, “cross-case searching tactics enhance the probability that the investigators will capture the novel findings which may exist in the data”. (Eisenhardt 1989)

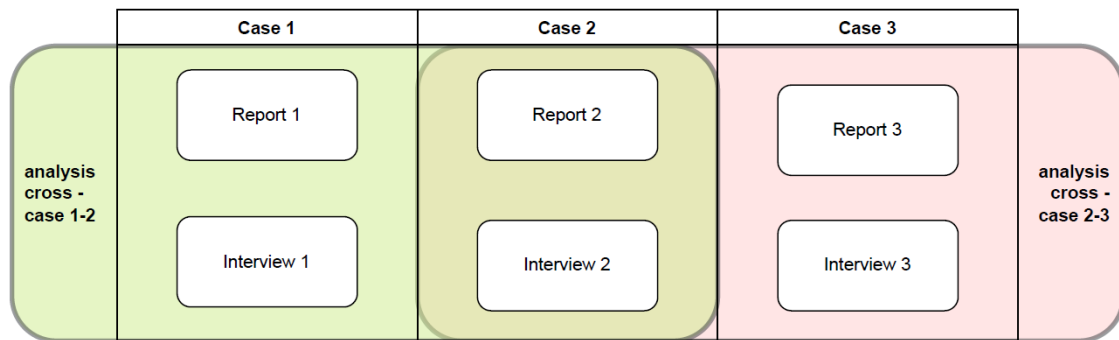


Figure 18: Cross-case analysis scheme (created with Draw.io)

6.3.1. Within case analysis

A preliminary snooping of the data cleaned was given within each case in order to find any interesting observations about the dataset. Several points have been found:

- Reports in almost all the cases present more codes due to the length of the document with respect to interviews. Below is reported an example of codes presence in a case (report and interview), the common codes are not included in the table to show the complementarity of the data sources.
- In all the cases, the reports and the interviews complement each other, leading to a strong internal validity.
- The cases without the report (Cases 1 and 2) do not have the same level of internal validity but are still considered in the analysis since they can provide additional information useful for the purposes of the study.
- In the interviews in general, the interviewee prefers to stress the macro-themes giving not only data but also opinions and insights on the topics proposed. Indeed, the highest coding presence is always the macro-categories
- The reports are on the contrary prone to go into detail for each of the sub-indicators
- The highest coverage indicators are never the same within a case: interviews and reports of the same company show different codes of priority
- There are no specific distributions or patterns followed within the cases

Table 6: Example of codes identified in a case (report and interview), the common codes are not included in the table.

Case #3

CODES IN REPORT	CODES IN INTERVIEW
Working conditions & well-being	Geographical context
# Of days off	Minimum healthcare
Anti-corruption practices	
# Of initiatives supporting the development of workers' skills	
Male vs female employment	
Inclusivity for disabled people	
Proper space for ethical and health guidelines	
# Of inquiries from customers	
Investments in alternatives (surrogates)	
B Corp certification	
Benefits from sustainability practices	
Degree of information disclosure	

Below, an example of a within-case analysis is reported to show how the reports are more focused on specific themes while interviews deal with more general and broad topics. In particular, the graphs report on the x-axis the label used for the different codes used for the documents coding process, and on the y-axis is reported the percentage coverage reached by every single code. The graphs report, in descendant order, the twenty codes that have the highest percentage coverage. The percentage coverage represents the percentage of the entire interview that during the coding process, automatic or manual, was assigned to a specific code.

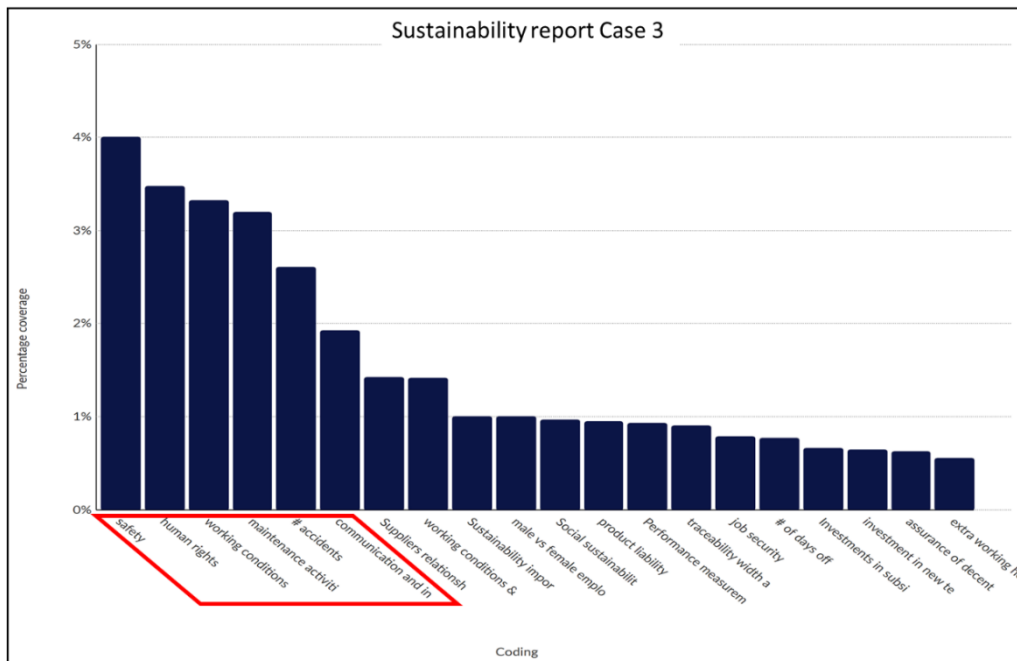


Figure 19: histogram reporting the highest frequency % codes presence in Case 3 report (Built from: N Vivo software)

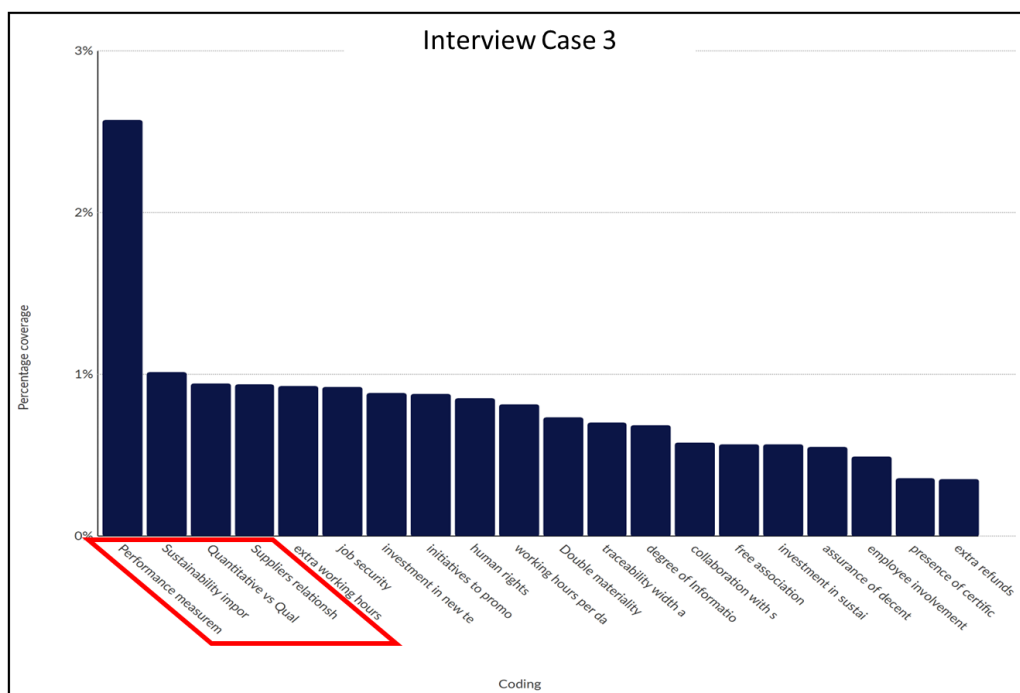


Figure 20: Histogram reporting the highest frequency % codes presence in case 3 interview (Built from: N Vivo software)

As shown in the graphs reported for case #3, the highest frequency codes in the interview are performance measurement, sustainability importance, quantitative vs qualitative and supplier relationship. On the other hand, in the report, the highest frequency is safety, human rights, working conditions, maintenance activities # accidents and other similar codes. This supports the previous statements about the difference in priorities given in the two different types of sources.

Since the aim of the analysis is also to identify which are the contingent factors influencing the implementation of social practices and their assessment, it is crucial to make comparisons also between cases moving away from the within-case.

6.3.2. Cross-case analysis

After comparing the reports and the interviews within all the cases, to see how the codes are distributed among the cases, a cross-case analysis was performed. This type of analysis allows identifying how contingent factors may influence the sustainability approach but also may allow highlighting patterns or trends across all the cases. For example, a cross-case analysis may be useful to understand how stakeholders belonging to different stages of the supply chain give priority to different topics. (Eisenhardt 1989)

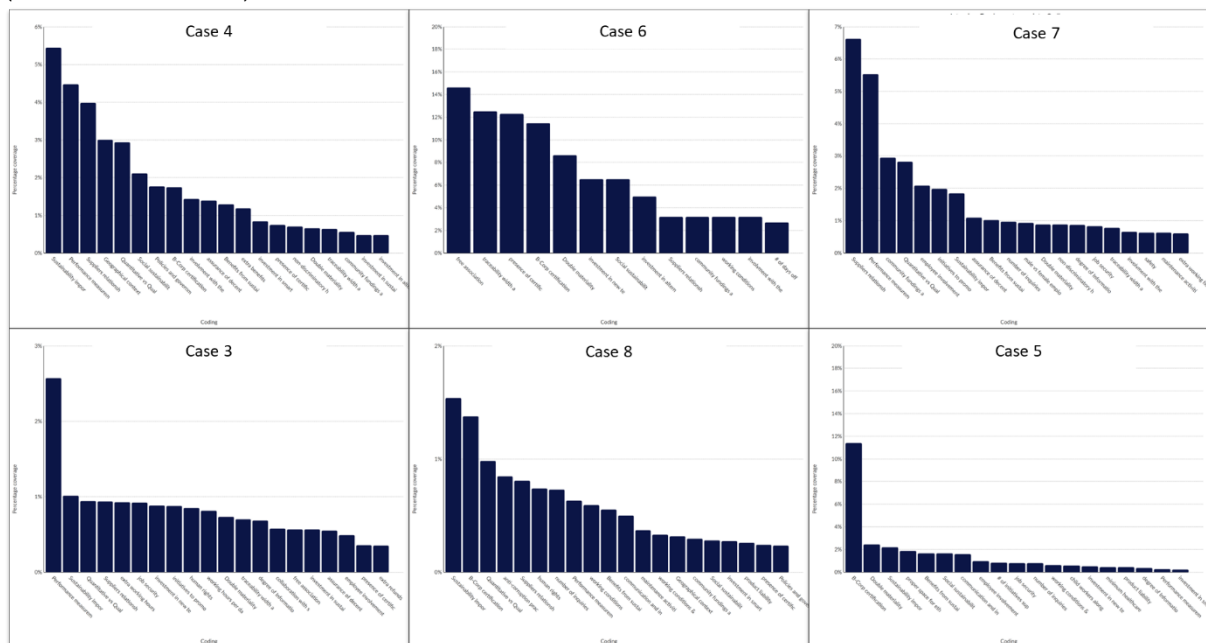


Figure 21: Set of graphs of interviews for cases 3-4-5-6-7-8 (Built from: N Vivo software)

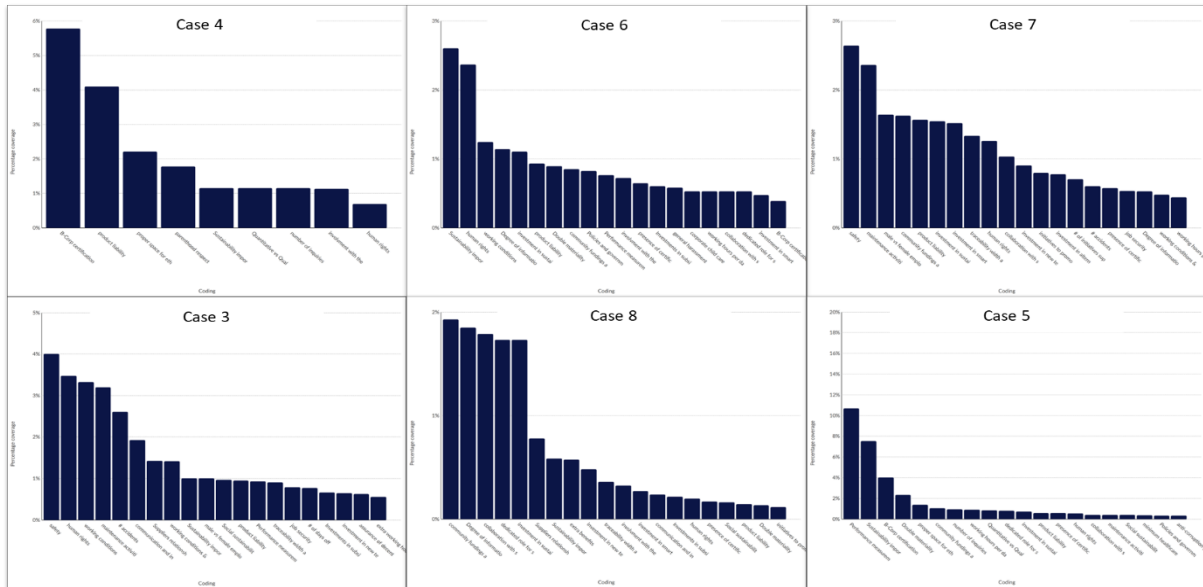


Figure 22: Set of graphs of reports for cases 3-4-5-6-7-8 (Built from: N Vivo software)

N Vivo was particularly helpful to perform this configuration because of its additional tools for case comparison.

At first, we compared the cases one by one to spot any possible peculiarity or trend; as in the within-case analysis, there are no specific distributions or patterns followed in the comparison cross-cases. We, therefore, considered an additional tool of the software called “Matrix Coding Query”. It is indeed possible to create a matrix that comprises all the coding performed on the files and group it in an excel sheet.

Since the files are 14 and the codes are almost 50, the complete table is reported in Annex I and here below there is only the matrix related to the macro-indicators for all the cases. Basically, the matrix is reporting on the y-axis the cases numbered as previously agreed, and on the x-axis the first level codes presented in section 6.2. In the cells, there are the frequencies of the codes appearing in a whole case (interview + report), that has been formatted in Microsoft Excel ranging from green (high frequency) and red (low frequency).

CASE	Performance measurement tools	Sustainability importance	Suppliers relationship	B-Corp certification	Double materiality	Quantitative vs Qualitative	Policies and government incentives	Benefits from sustainability practices	Geographical context
Case 3	40	32	42	3	14	7	17	5	1
Case 7	25	7	14	5	22	15	0	9	5
Case 4	20	14	19	11	4	8	10	7	3
Case 5	27	21	0	24	13	4	2	4	0
Case 8	3	10	18	6	1	3	3	5	3
Case 6	4	5	4	1	2	0	2	1	0
Case 2	0	2	0	5	1	2	0	0	0
Case 1	0	7	2	1	4	1	0	1	0

A
B
C

Figure 23: Matrix Coding Query for macro-codes (Extracted from N Vivo to Microsoft Excel)

Referring to the “macro-codes matrix” an important distinction can be made. It is possible to identify 3 classes of frequency across the cases:

- **A** = high-pressure on Performance Measurement Tools, Sustainability Importance, Suppliers Relationship, B Corp Certification and double materiality
- **B** = average pressure on differences between Qualitative and Quantitative indicators, Policies and Government Incentives and Benefits from Sustainability Practices
- **C** = low-pressure category for the Geographical Context

Referring also to the complete matrix in the Annex, several additional observations are possible:

- Cases 3 and 7 monitor a lot of indicators, they present high values in many codes. On the other hand, cases 1 and 2 show very low frequencies in most of the cases.
- Some specific codes have opposite behaviours along the matrix. Maintenance activities, Policies and Government Incentives and child workers along the supply chain are 3 examples.
- The central part of the table is a cluster of indicators with variability in the frequencies, some cases put high pressure while others do not.

6.4. Discussion of findings

It is necessary to consider both the reports and the interviews to ensure internal validity, the codes complement each other in the two data sources. The priority given to specific topics is different from the reports and the interviews, this can be translated

into what is the actual pressure inside the company for sustainability practices. It sometimes can be a signal of Greenwashing, a phenomenon that has recently been gaining more and more attention, the reports can be a channel to spread a lot of information that in reality are not so relevant.

Regarding Performance Measurement tools (the highest frequency code), it is evident that larger companies use specific KPIs for every single project that cannot be part of a standardized method due to the variability of the initiatives and length of a Multi-Tier chain. For instance, company #7 defined during the interview that social sustainability is a grey area and that every project implemented should be evaluated through a specific set of KPIs. On the other hand, smaller companies are less prone to develop their own PM tools but seem to prefer relying on tools provided by external organizations that can also provide a certification such as B Lab (granting a score, a certification and some improvement actions). This is often prevented by the fact that external entities are expensive and rigorous (i.e., large and small companies often must answer the same set of questions even if are very different). Indeed (excluding case 1, the certification company) 3 out of the 5 cases were B Corp.

These first observations are indeed confirmed by the fact that cases 3 and 7 (the two large companies) present codes for almost all the indicators, while smaller companies do not. This leads to consider also the amount of effort and resources available in a company, there are differences in how much time and money can be devoted to developing sustainability practices or drawing up a set of KPIs. Being social sustainability a grey area, companies struggle to find a set of indicators defining this sphere.

The central part of the complete Matrix Coding Query is a cluster of indicators that in most of the companies interviewed are considered essential but since some of them can be given for granted (e.g. wages, discrimination, job security, ...) sometimes might be low-positioned (by frequency) or even absent. There are though some groups of indicators that can lead to the consideration of contingent factors influencing a Social Sustainability PM Tool.

- Example 1: Child workers code is not mentioned at all in case 7, while in cases 3 and 8 are present. These last two, are companies that work closer to field workers (fruits/veg/coffee growers) so are prone to keep a specific focus on field workers-related indicators (i.e. the position of a company in the chain is a Critical Factor when designing a PM tool)
- Example 2: Surrogates and smart packaging codes present opposite behaviours in companies 7 and 3. The former consider them, the latter just marginally. This may be due to the different processes involved in the specific company: different supply chain stages determine different priorities given to each indicator. Case 7 is reported to be implied in almost all the supply chain stages

(has processing, logistics and retailing functions) while case 3 is mainly a logistic player. This is an aspect that must have high relevance in designing a useful PM tool

- Example 3: Hazardous substances code is absent in all the companies since none of them is directly concerned with this indicator

6.4.1. How to assess social sustainability in the food supply chain

Based on the insights previously presented in this Chapter, we tried to build a tool with different features: it should be user-friendly, not resource-consuming, flexible and adaptable to different specific situations whilst results should be easily readable and interpretable.

It is fundamental that the output of this tool will be shown as quantitative results so that it can be easily and rapidly understood and can provide guidance on where intervention is required to improve the performance or instead where the company is already performing well.

Thus, the plan is to design a single tool prone to adapt to different scenarios. First of all, to clarify the position of the company along the chain, it is necessary to fill in an identity card (see figure 23). On the left, the practitioner should fill in general information about the company assessed, on the right the correct supply chain stage must be chosen.

COMPANY IDENTITY CARD	
NAME	
SUPPLY CHAIN STEP	
SIZE (EMPLOYEES)	
NET SALES (or similar)	
STATUS	
Note	

Processing
SUPPLY CHAIN STAGES
Growing
Processing
Logistics
Retailing

Figure 24: Identity cards to be filled in when starting using the tool (Created with Microsoft Excel).

The general idea is then to use a fixed set of categories, sub-categories and indicators that are those presented in Chapter 4 (as showed in Figure 24). Sub-categories and indicators are then assigned a weight that is mutable depending on the specific supply

MACRO-CATEGORY	CATEGORY	INDICATOR
Working conditions & well-being	Working conditions	Assurance of decent wages
		Working hours per day
		Extra working hours per day
		Job security
		# of days off available per year
		Free association (labour unions)
	Safety	# of working accidents per year
		Degree of exposition to hazardous substances
		Maintenance activities
		Investments in new technologies and training courses
		Minimum health care
		# of initiatives supporting the development of workers' skills
	Extra benefits	Investments in subsidiary equipment for the working environment
		Corporate childcare
		Extra refunds
		Degree of information sharing towards workers about company activities
Communication & involvement	Decision making involvement	
	Initiatives to promote involvement	
	Presence of anti-corruption practices and/or policies	
	Child workers along the supply chain	
Human rights	Human rights	Male vs female employment full time labour
		Average wages of female employees vs average wages of overall workers
		Inclusivity for disabled people
		Parenthood respect
		Non-discriminatory hiring about origin and disability
		General harassment
Product liability	Product liability	Disposition of space for ethical and health guidelines on the labels
		# of inquiries from customers (or retires from the market)
		Traceability width and depth
		Presence of certifications
		Investment in alternatives (such as surrogates, gluten-free, vegan options)
		Investment in Smart packaging or innovative solutions
Involvement with the community & public affair	Involvement with the community & public affair	Community fundings and support initiatives
		Fundings invested in social events or sustainable cooperatives/NGOs
		Collaboration with start-ups for food recovery
		Sustainability monitoring role
		Degree of information disclosure

Figure 25: List of categories, sub-categories and indicators (Created with Microsoft Excel).

chain stage to which the company analysed belongs. The higher the weight, the higher the importance given to a certain topic, this has no limits in terms of the number assigned but it's up to the practitioner to normalize the weights to prioritize some indicators or categories with respect to others.

Figure 25 shows a table that needs to be filled in the yellow cells with the abovementioned weights. In this table are reported four sections, one for each of the supply chain stages identified. The example shown in figure 25 has all the cells equal to 0 since it's ready to be filled.

CAT. WEIGHT	WEIGHT	POINTS	SCORE	MAX	OUTPUT/ACTION	CATEGORY STATUS	INDICATOR SITAUTION
9	2	1	18	90		72,14%	
	4	5	180	180			
	5	2	90	225			
	10	5	450	450			
	2	2	36	90			
2	5	3	135	225		71,85%	
	5	3	30	50			
	8	5	80	80			
	10	3	60	100			
9	4	3	24	40		82,07%	
	9	5	405	405			
	5	2	90	225			
	4	5	180	180			
	9	4	324	405			
6	2	4	72	90		48,33%	
	3	5	90	90			
	4	1	24	120			
	5	2	60	150			
10	10	2	200	500		68,89%	
	2	5	100	100			
	7	5	350	350			
	10	1	100	500			
	8	5	400	400			
	1	5	50	50			
	7	5	350	350			
8	3	5	120	120	61,48%		
	8	2	128	320			
	3	5	120	120			
	4	5	160	160			
	7	1	56	280			
5	2	5	80	80	51,72%		
	3	5	75	75			
	5	2	50	125			
	5	5	125	125			
	7	1	35	175			
	9	2	90	225			
FINAL SCORE:			68,1%				

Figure 27: Example of the table filled in with weights and scores. (Created with Microsoft Excel).

Figure 26 reports an example just to show how the final evaluation sheet will look like. The categories and indicators weights are random and do not refer to any of the cases studied and interviewed in this work. Also, the points are randomly assigned to every indicator. In this case, it is possible to see that the overall performance is reported to be 68.1%. This means that in this example the “company” collected a score that is 68.1% of the maximum score available with that specific weight distribution. Moreover, it can be seen that this “company” gained only 48.33% of the available maximum score in the *Communication & Involvement* category. It is possible that some corrective actions and some new practices may be implemented in this field to achieve better results.

Since our goal is to develop a user-friendly PM tool it’s been decided to develop it as an excel file that just needs to be filled in the right spots. A “READ-ME” (reported in Annex I) file is attached in the tool as a section where there is explained exactly how it works and where to fill it, both for the weights and the scores.

This decision tool presents many of the characteristics that address the gaps in the literature and build upon the findings of the analysis of the cases. Nonetheless, the tool presents a limitation since the only variable that can be changed is the supply chain stage. This might be expanded in a future application providing the tool with some

additional features that would allow it to adapt to different companies or suppliers based on the type of product handled.

6.4.2. Framework evolution for social SPM

After presenting our roadmap, the main findings, the discussion and the contributions, one last explanatory image may surely help to sum up everything written in this study. Below, the last two schemes show the evolution of the framework proposed with the integration of the research contribution in it.

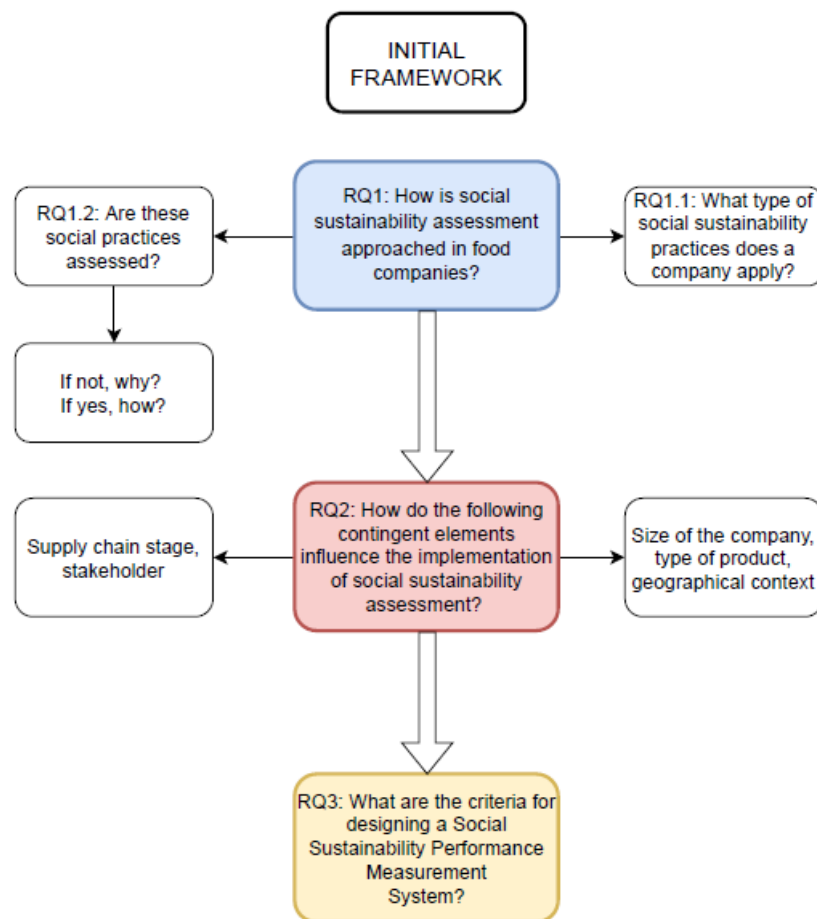


Figure 28: Scheme of the Research Questions' initial framework. (Created with Draw.io)

The initial framework shown in Figure 28 can be well defined through the Research Questions identified in Chapter 2. Social sustainability performance measurement is considered fundamental by all the companies' interviewees, some use their own PM system, others rely on third-party entities and others do not implement any method to assess social sustainability practices, defining 3 categories of priority. Not all companies have a department dedicated to sustainability. In only three cases the interviewees deal with only sustainability during their workdays, in all the other cases people also work on other topics. In general, the biggest companies are the ones that

are equipped with sustainability or corporate social responsibility department. This confirms that the size of the company is a contingent factor that influences how they approach SSPM.

In Chapter 6.4 we stated that also the position in the supply chain and the type of product handled are crucial contingent elements to be considered. What finally arose during all the interviews, was the need for specific criteria when designing a PM tool: affordability, flexibility, user friendly and reliability.

The framework was therefore refined through the outputs of the study and the answering to the research questions in a more complete version. In the sides of the scheme, the RQs were given with a different colour and their intersection shows how we tried to answer them, while in the centre the main empirical contribution was put in order to better identify the path followed along the whole study.

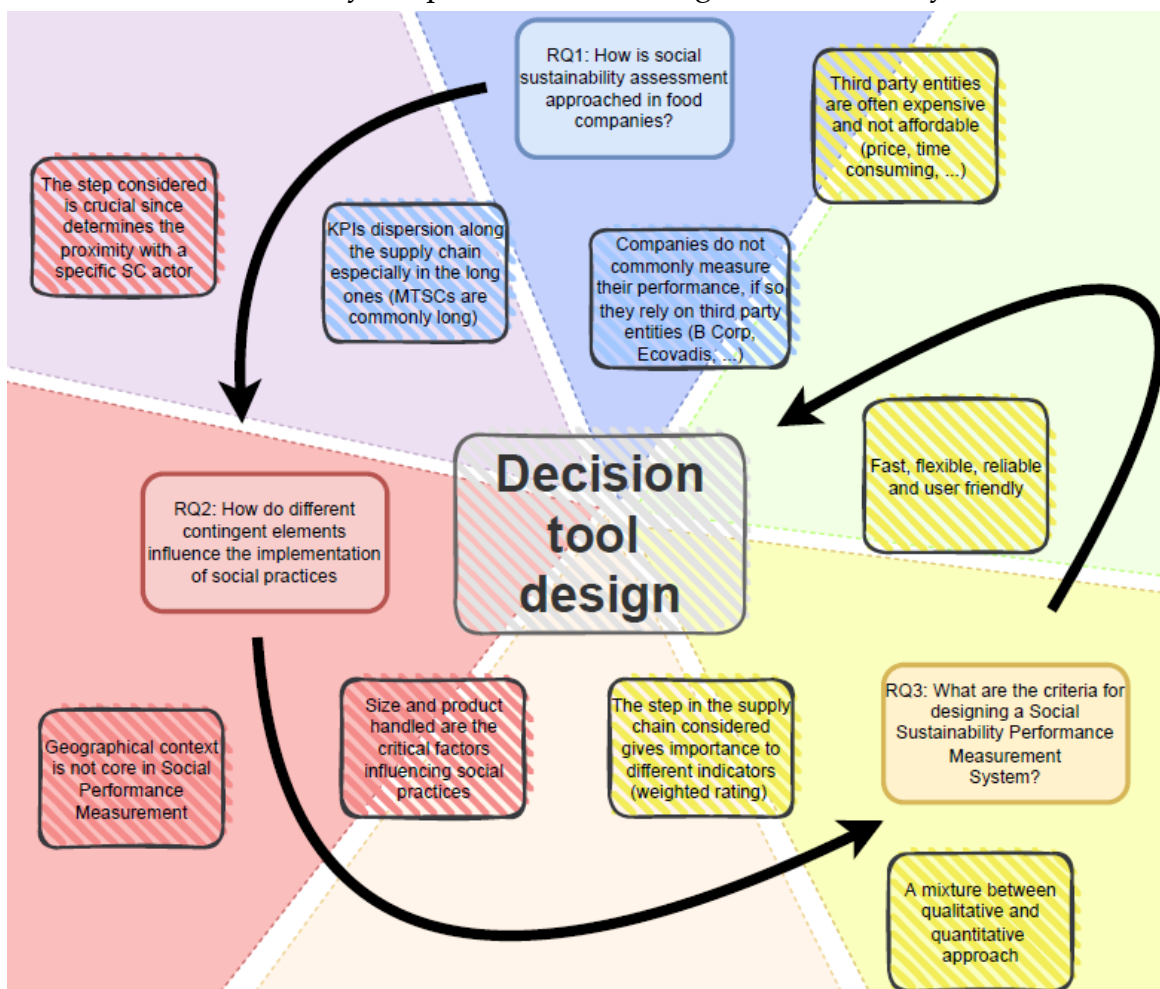


Figure 29: Final framework proposal scheme, the colours identify the 3 RQs of the study, and their intersections the main answers. (Created with Draw.io)

Chapter 7

CONCLUSIONS

This study has the main objective to map the state of the art of sustainable multi-tier supply chain performance measurement systems in the food and beverage industry while developing a complete framework with key performance indicators applied in a multiple case study approach, focused on social sustainability.

The multiple case study method led to semi-structured interviews along with sustainability reports allowing to gather data from 8 companies belonging to the Italian agri-food sector. The two kinds of sources were translated through text analytics into data that were further analysed following within-case and cross-case approaches. Therefore, the most relevant indicators for social sustainability assessment were identified followed by insights on the importance of contingent factors.

To sum up, based on the previous statements, it is clear that a single and static “one fits all” solution is not feasible for assessing social sustainability. It must be kept into account that there are specific elements that may influence the sustainability practices implementation of a company in a supply chain and therefore how that company assesses different sustainability aspects. Indeed, different contingent factors characterize the sustainability practices and their assessment, the most relevant arose in this study are resource availability (in terms of time, people and funds) and the supply chain stage; in this tool, we will consider only the latter one.

The main contribution of the theory is first of all a mapping of the state of the art concerning the topics just mentioned, we build a preliminary conceptual framework comprising the literature background related to performance measurement in the food and beverage industry. Since social sustainability appears to be an unexplored area, the first zoom is on practices and their assessment along the supply chain around social matters. From this literature background, the need for a specific set of KPIs was fundamental to identifying critical factors in the analysis of a social-oriented PM. These indicators, not only complement the literature framework suggested, but also may find a practical application when translated into an interview. Keeping an inductive and rigorous methodology along with a multiple case study approach, we then tried to put in place a more practical solution to the lack of social sustainability assessment in the FSC scenario. Finally, an additional contribution to the usage of a rigorous coding method is the approach given to text analytics: 4 out of the 14 documents were manually coded. All the cases were also strong in internal validity due to the presence of 2 types of documents in each.

The contribution given to practitioners can be identified in the empirical steps of the study. First, the collection of primary and secondary data for 8 cases allows the building of a strong basis on which to develop a series of observations and a discussion. From the analysis of all the data gathered arose a strong focus of the companies on sustainability themes, underlining the importance of a structured approach to the assessment of the performance in this area. The indicators showed that this kind of assessment is not free from several specific contingent factors that highlight the importance of being flexible. Indeed, the position in the chain, the type of product handled, the stakeholder considered, the size of the company and the geographical context were tackled in the discussion, leading to consider some of them in the possible contribution of this study. The need for a practical PM tool that might help the companies in assessing their social performances while at the same time not relying on big internal resources (in terms of time, employees and money).

Another empirical contribution is, therefore, the design of a decision tool that can be easily used in a company by the ones who can concern with it and can give useful insights about not only their own firm but eventually, the whole supply chain depending on the data availability and the purpose of the investigation.

The main limitations to this work are first, the limited number of companies in the study that in the future could be widened for bringing significant statistical evidences to the discussion but also to refine even better the set of KPIs identified. Hence, it might be interesting as a future application, to broaden the number of companies or focus on a specific target (i.e. considering many cases with the same supply chain structure). Also, not all companies considered draw up a sustainability report, 2 of the 8 cases of our study. Our aim was not to map the whole supply chain scenario, so we considered only a part of it. The sample can be expanded with other companies belonging to other stages or handling different kinds of products. Finally, the tool proposed is not being tested yet, in possible future applications the need for a refined version may open a discussion on its implementation

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MACRO-CATEGORY	CATEGORY	INDICATORS	QUESTION/EXPLANATION	CAI WEIGHT	WEIGHT	POINTS	SCORE	MAX	OUTPUT/ACTION	CATEGORY STATUS	INDICATOR STRATIFICATION
Working conditions & well-being	Working conditions	Adequacy of recent wages	Are the wages suitable to support a good standard of living? Are employees satisfied? Do the daily/weekly working hours ensure a good balance?	1	9	1	81	405			
		Working hours per day	Do the daily/weekly working hours ensure a good balance?	1	9	1	45	45			
		Extra working hours per day	How are the extra working hours considered/reimbursed?	2	9	2	182	405			
		Job security	How is the contact with all the employees handled? Are there any reserves?	9	9	5	405	405	54.38%		
		# of days off available per year	Are days off reserved and respect a productive break from work?	2	2	2	35	90			
		Free association (labour union)	How is the labour union situation handled?	2	2	3	54	90			
		# of working accidents per year	Is the level of accidents acceptable? How are accidents handled?	6	3	3	35	60			
		Degree of exposure to hazardous substances	Are there hazardous substances? Is the exposure safe and regulated?	6	5	6	60	60			
		Maintenance activities	Are maintenance activities performed regularly?	7	3	3	42	70			
	Safety	Investments in new technologies and training courses	How much money is invested in training courses and new technologies?	5	3	3	30	50			
		Minimum health care	Is there health care? Does it satisfy employees?	10	5	5	150	150	70.00%		
		# of initiatives supporting the development of workers' skills	Are there initiatives or training courses? Do you see improvement in workers' skill/productivity?	6	2	2	35	90			
		Investment in auxiliary equipment for the working environment	How is the working environment? Is it suitable to the employees to manage the daily tasks?	10	5	5	150	150	84.44%		
		Corporate culture	Is there a plan for children? Is it efficient?	6	4	4	72	90			
		Extra refunds	Are refunds available? Is there a welfare plan?	4	4	4	48	60			
Extra benefits	Degree of information sharing towards workers about company activities	How is communication handled? Is there a communication channel? How employees perceive it?	3	3	3	150	150	40.00%			
	Initiatives to promote involvement	How is involvement among the employees handled? Are there initiatives towards it?	10	1	1	90	450				
	Presence of anti-corruption practices and/or policies	Are there anti-corruption practices? Is there a legal section to monitor it?	3	3	2	60	150				
	Child workers along the supply chain	Are there parental monitoring on child workers along the value supply chain?	2	2	2	32	80				
	Male vs female employment (full time labor)	How is the % of male and female employees? How is it in the highest positions?	6	5	5	240	240				
	Average wages of female employees vs average wages of overall workers	Are the wages of male and female employees equal?	3	1	1	24	120				
	Inclusivity for disabled people	Are there disabled people in the company? Are there facilities for them?	3	5	5	400	400	88.71%			
	Parental leave respect	How much time is given for parenthood? For male and female?	10	5	5	80	80				
	Non-discrimination/being about origin and disability	Are the hiring regulations checked in terms of origins or disability of people?	2	5	5	80	360				
	Gender harassment	How is the harassment in the workplace handled? Do employees file any feedback?	9	5	5	360	360				
Product liability	Boycott of space for ethical and health guidelines on the labels	Is there the space on labels to properly apply ethical and health guidelines?	4	2	2	80	80				
	# of inquiries from customers (or critics from the market)	How are enquiries handled? Are they public? Is it an acceptable number?	2	2	2	15	40				
	Traceability within and depth	Is there a reliable and certified traceability plan? How wide and deep is it?	5	5	5	60	60				
	Presence of certifications	Are there certifications? Which one? How do they provide additional value?	9	1	1	32	180				
	Investment in alternatives (such as sustainable, gluten free, vegan options)	Do you invest in alternatives for minor sectors like vegan options, gluten free, sustainable?	8	1	1	32	160				
	Investment in smart packaging or innovative solutions	Are there investments in innovative solutions for sustainable packaging?	10	5	5	200	200				
	Community funding and support initiatives	Are funding for support initiatives and impact? Do you invest in community initiatives?	10	2	2	15	40				
	Fundings invested in social events or sustainable corporate/NGOs	Are you in collaboration with NGOs or corporate with the aim to support social issues? Do you invest in sustainable social events?	2	2	2	15	40				
	Collaboration with start-ups for food recovery	Are you in collaboration with start-ups for food recovery?	10	5	5	200	200				
	Sustainability monitoring tools	Is there an office or a tool to monitor the sustainability practices?	6	1	1	24	120				
Degree of information disclosure	Are there any channels to share information towards consumers? How important is it?	10	2	2	80	200					
FINAL SCORE:							69.2%				

Explanation of the way to use this tool (italian version below)

This excel file is intended to be a self-evaluation about the Performance Measurement (PM) in the social sustainability dimension. This first sheet works as an identity card of the company: name, status, type, ... (see legenda) to be filled in at the beginning of the activity. The only sheets you need to have a look are the following:

Weights table: in this sheet you just have to fill una tantum the "cat. weight" and "weight" columns for the different stages of the supply chain (Retail, Logistics, ...) based on which is of your personal interest. You need to give higher values to the categories and the indicators that you think are the most relevant ones: the higher the value assigned to a category or to an indicator and the bigger its impact will be on the final score (and of course in your Supply Chain Step. This work must be done only on the steps you are interested in evaluating. We suggest, for the sake of simplicity, to use values from 1 to 10, but you are free to use all the values you want, the tool will work anyways normalizing the values.

Evaluation sheet: this is the real tool in which the PM is performed: first of all, the type of step in the supply chain must be chosen in the top yellow box (Retail, Logistics, ...).

The "points" column is where for each indicator a value from 0 to 5 must be selected from the drop down menu (this represents how good the evaluated company performs in relation to that indicator, 1 bad and 5 very good). The criteria to be followed when choosing a value must keep into consideration all the possible practices connected to the indicator itself. This value, together with the "cat.weight" and the "weight" of that indicator, is used to give a "score" that will eventually be used for the overall performance assessment. This "score" column must respect the "max" column value (i.e. must be \leq of the "max column" value.

Be self-conscious when filling the values, the output is intended only for the company improvement. The output/action column contains a general evaluation on the specific indicator when needed.

In the bottom cell of the "score" column, there is the final overall evaluation in %, with the corresponding colour from red (negative) to green (positive).

Finally, in the right part of the sheet there are some visual graphs to better identify throughout categories and single indicators the situation, the longer the bar, the better is the performance of the company in that specific topic (i.e. if the bar completely fills the cell it means that the company is already doing the best possible in that topic). Consider an improvement action where the score is bad (a % of the total is also shown in the last graphs).

If you need it, a random example is reported in the *Weights table_EXAMPLE* and *Evaluation sheet_EXAMPLE* sheets, just in case.

In case you need to store the results of a company, it is possible to make a copy of the "Evaluation Sheet" sheet by clicking CONTROL + SHIFT + L . To do this it is needed that when opening this Excel file you enable the Macros.

ALL THE CELLS IN WHICH IT IS POSSIBLE TO INSERT A VALUE/SENTENCE ARE WITH THIS COLOUR

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