



Social procurement practices in food logistics: A case study of a South European food processing company

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ABSTRACT

The covid-19 pandemic has shown how an unpredictable event may affect the sustainability of the entire food supply chain highlighting the need for a sustainable approach to food logistics. While existing literature has focused on production and consumption, little attention has been paid to measuring social sustainability in food transportation. This is a critical gap, as transportation plays a vital role in ensuring the timely and safe delivery of food. This paper proposes a novel approach to measure social sustainability in the context of food logistics within a South European food processing company. The focus is on assessing social procurement practices at the level of logistics suppliers. The methodology developed is based on two levels, seven dimensions, and twenty-one food logistics social sustainability indicators. To validate this, the methodology is adopted to assess the social procurement of five food logistics suppliers (FLS) of a European food company and found significant variations in performance across different dimensions. The results suggest that the dimension in which suppliers perform well are: “characteristics and work welfare”, “health of employees”, and “human rights implementation and integration”. On the other hand, the dimensions that score lowest for all suppliers are “diversity and equal opportunities”, “external stakeholder community capital”, and “innovation practices”. The strength of this methodology lies in its ability to quantify social sustainability in food logistics and its practical implementation within the food logistics company, as well as among its logistics suppliers, in terms of social procurement. The results offer valuable insights and suggestions for the case study food company to improve their consideration of social sustainability aspects in a more comprehensive and effective manner throughout their business operations.

1. Introduction

The concept of sustainable development is becoming increasingly important in every field of human life, influencing different decision-making processes. Governments worldwide have adopted a sustainability-driven approach to curtail the adverse effects of natural resource over exploitation. The first definition of sustainable development was proposed by Brundtland (Brundtland, 1988), which advocates the triple bottom line approach to overcome the model in which environmental damage and social inequalities are the costs to be paid for economic growth (Norman and MacDonald, 2004; Sarkis et al., 2010). The emphasis on social and environmental sustainability in development models has captured global attention with the challenge of pursuing economic profit, societal well-being, and environmental protection together while finding suitable ways to measure them. Despite this trend, the social dimension of sustainability is the least analyzed aspect in most of the scientific and governmental

contributions, despite the available consensus on its definition (Popovic et al., 2018). Social sustainability involves managing social resources such as people’s abilities, institutions, relationships, and social values (Sarkis et al., 2010), and is focused on various dimensions, including equity, working conditions, participation, fair wages, cultural diversity, and human rights (Rajak and Vinodh, 2015). Nonetheless, there is still no consensus on appropriate and universal methods for measuring it (Sharpe and Barling, 2019).

The United Nations with their 17 Sustainable Development Goals emphasizes that a sustainable food system is essential for the achievement of sustainable development (UN Food system summit 2021). The Covid-19 pandemic has shown how an unpredictable situation may affect the performances of all stages of the food supply chain (Eurostat, 2019). Government-imposed restrictions have led to significant changes in consumption patterns, causing sudden fluctuations in food demand, panic buying, and trade restrictions. As a result, the entire food supply chain has been heavily impacted, especially employees working in the

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transportation sector who have ensured the continuous supply of food during the emergency period (Aday and Aday, 2020; Rinaldi et al., 2022). For all this reason, in order to achieve effective sustainable development, it is necessary to strengthen the resilience of the food supply chain (Huff et al., 2015), rethinking the current model of food production, consumption, and distribution.

The food system's three aspects, production, consumption, and distribution, have negative impacts on the environment, society, and economy (FAO, 2017; Corbera et al., 2017). Current food production practices overexploit natural resources and result in environmental issues like climate change, soil and water pollution, and deforestation, leading to social injustice (FAO, 2013). Food transportation in the Eu-27 was about 1.2 billion tonnes in 2017–2018, significantly affecting the continent's economic productivity (Eurostat, 2019). However, the economic profits of the food transportation sector do not equally benefit all players in the supply chain. The sector's negative environmental impacts, such as road congestion, air pollution, and noise in urban areas, are well-documented (Kumar and Anbanandam, 2019), making it a crucial point in the food supply chain for its overall sustainability (Djekic et al., 2018). EU's "From Farm to Fork" strategy supports sustainable food systems recognizing transportation and distribution sectors' vital role in linking production and consumption (Eurostat, 2019).

Although there are measures for assessing the economic and environmental performance of such food transportation systems (Aazami and Saidi-Mehrabadi, 2021), there is still a lack of consistent social performance measures to evaluate working conditions of operators and companies' overall performance. Additionally, there is a constant demand for transparency from end consumers regarding the impacts that the transportation of their products has on the environment, economy, and society (Freitag et al., 2020).

This research introduces a methodological approach aimed at measuring social sustainability within a specific case study of a food processing company in Southern Europe. To fulfil these research objectives, a deeper understanding of social sustainability and its dynamics is fundamental, particularly in the portion of the food chain where operator working conditions are often neglected, and consumers are not fully aware of these dynamics. Literature typically proposes measures for assessing sustainability performance that focus on the overall performance of an entire company. However, applying the methodology proposed by this research to a specific business division would allow for a more comprehensive understanding of its performance, identifying areas of strength and weakness that can be improved.

Taking into consideration all these aspects, the objective of the present work is to enhance the understanding of social sustainability in the context of food transportation. Despite the growing interest among academics and civil society, literature has not given sufficient attention to this issue, as highlighted by Schmitt et al. (2017). Existing literature has focused on proposing methods to measure the environmental and economic externalities of food transportation (Mangla et al., 2019; Djekic et al., 2018; Heard et al., 2018), but the lack of appropriate methods to quantify social sustainability and the paucity of adequate methods to quantify it (identified by Sharpe and Barling (2019), Psarikidou and Szerszynski (2012), McGuinn (2020), Ballet et al. (2003)) is a major gap that this work aims to address. To achieve this, the present manuscript introduces a methodological approach focused on measuring social sustainability specifically at the logistics supplier level within an Italian food company.

The study is structured as follows: Section 2 presents insights from a literature review on social sustainability assessment measures, focusing on transportation and food logistics sectors. In Section 3, the case study presented in this research is discussed. Section 4 provides an in-depth analysis of the research methodology used and proposes four steps for its implementation. Following the case study and methodology, section 5 presents the main results obtained from the study. Subsequently, section 6 provides a comprehensive discussion and analysis of these results. Finally, Section 7 concludes the study by providing practical

suggestions and valuable insights for businesses, supporting companies in their decision-making processes.

2. Literature review

Sustainability has three pillars: environmental, social, and economic. Defining and measuring the social dimension is challenging due to inconsistent definitions in literature. While the term generally refers to the ways in which people interact and organize (Sharpe and Barling, 2019) it is unclear whether it should only involve societal attributes, such as human rights, health, and equity, or also encompass the process of transforming society into a more socially sustainable one through participation, inclusion, and democracy (Sharpe and Barling, 2019; Psarikidou and Szerszynski, 2012).

The European Parliament acknowledges various definitions of social sustainability, but most include the main aspects of social development, such as basic needs, income distribution, working conditions, rights, access to social and health services and education. Moreover, the European Parliament emphasizes a dynamic definition that considers inter-generational equity and the relationships among social development, environmental protection, and economic growth (McGuinn, 2020). A further definition of social sustainability recalls the concept of human well-being, defining it as "the improvement of the capabilities of well-being (economic, social or environmental) for all, though the aspiration of equity on the one hand [...] and the transmission across the generations on the other hand" (Ballet et al., 2003). Despite varied definitions and fields, social sustainability incorporates common concepts: well-being, human rights, equity, health, safety, ethics, and human needs, enabling the identification of common dimensions.

2.1. Methodology dimensions

Despite a general consensus on the definition of social sustainability among international organizations and researchers, different viewpoints exist on its dimensions.

Labuschagne et al. study (2005) represents a milestone in the analysis of social sustainability and the definition of the concept's dimensions. These authors developed an index to measure the social sustainability performances of industries, focusing on four main dimensions, namely the human resources inside an organization, the impact of the organization on the external population living in the community, the assessment of the relationships between company and stakeholders (internal and external), and the macro social performance to which the organization contributes. Many authors adapt this conceptual classification to their own field of investigation. Rajak and Vinodh (2015) performed a literature review on social sustainability evaluation and developed a fuzzy social sustainability index for determining how socially sustainable an organization is. As Labuschagne did, their focus is on four enablers: internal human resources, external population, stakeholder participation, and macro social performance. Popovic et al. (2018) include impact categories such as labour practices, decent work, human rights, society, and product responsibility, emphasizing the need to consider both internal and external dimensions in measuring social sustainability in the supply chain. Finally, Mani et al. (2016) proposed a model to assess social sustainability performance along the supply chain in Indian industry and identified six dimensions to be analyzed: equity, safety, health and welfare, philanthropy, ethics, and human rights.

2.2. Social sustainability at transportation and food logistics level

As mentioned in the introduction section, many instruments have been developed for managing sustainability issues in the transportation sector. Despite this, the analysis of social sustainability in the transportation sector is often carried out together with a macro evaluation of sustainability performance, paying more attention to the economic and

environmental impacts and their related indicators. In this regard, [Bandeira et al. \(2018\)](#) proposed a multi-criteria model to evaluate sustainability in the transportation sector, considering sustainability indicators related to the environment, economic, and social issues. Concerning the latter, they proposed three quantitative indicators in order to capture social sustainability in urban freight transport operations, such as the number of traffic accidents to measure the system safety, and the income and tax generated per ton-km to measure the amount of labour and income generated. Considering different dimensions is essential for the assessment of social sustainability, especially for the transport and logistics sector since it affects internal resources, the economy, and the community living near the transportation source. To this purpose, [Rajak et al. \(2016\)](#) proposed an approach capable of addressing the major issues related to sustainability in the transportation sector. In addition, they provide a deeper analysis of social criteria, considering equity, human safety, community livability, community cohesion, government efficiency, involvement of stakeholders, and cultural preservation. Their study offers a substantiated framework that considers impacts and effects on the local community and on governmental efficiency due to the transportation systems. Similarly, [Kumar and Anbanandam \(2019\)](#), in an analysis of the freight transportation sector, propose an index for measuring social sustainability, adopting the dimensions proposed by [Labuschagne et al. \(2005\)](#). Furthermore, [Sarkis et al. \(2010\)](#) found the same gap in reverse logistics, where the measures generally adopted for assessing sustainability rely mainly on economic and environmental assessment, and social dimensions represent an emerging topic. After an extensive literature review, they re-adapt the framework of analysis proposed by [Labuschagne \(2005\)](#), contextualizing indicators to make them suitable for studying the impacts generated by the reverse logistics activity inside and outside the logistics source.

All of these contributions, which share the common objective of providing a useful tool for measuring sustainability in the transportation sector, provide measures that are mainly based on environmental and economic sustainability, with less emphasis on social sustainability. Furthermore, these proposed indicators are not specifically applied to the food logistics sector.

Only a few studies have partially addressed social sustainability in the food logistics sector. [Djekic et al. \(2018\)](#) proposed a transportation sustainability index, validated in two Serbia dairy industries. The index includes all dimensions of sustainability, but not specifically social sustainability. Djekic found some social variables to calculate the food transportation sustainability footprint, such as the number of transport employees, the general availability of food products, the health and safety of transportation workers, and the food safety of products. They want to cover the literature gap according to which there is a specific tool for measuring sustainability in the transportation of some specific food products, which requires specific transport measures. Another attempt to fill this gap in the literature is made by [Malak-Rawlikowska et al. \(2019\)](#) who analyze the sustainability issue related to the short food supply chain. Concerning social sustainability in transportation activities, they proposed two indicators: the number of worked hours in the distribution process (preparing products for transportation, loading, transporting, and selling by the producer) and gender equality, as the number of women working hours in the distribution process. [Köseli et al. \(2023\)](#) propose a clustering algorithm in order to reduce Co2 emissions of food transportation. Also, in this case social sustainability is considered only as a more comfortable work schedule for employees. Of these conceptual frameworks which have the common goal to measure social sustainability in food logistics, there are two main problems: few indicators are used to quantify social sustainability, and of those all are quantitative.

2.3. Social procurement and logistic social responsibility

A company can be defined as socially sustainable in its outputs if it is

so along the whole supply chain, evaluating the level of social sustainability also at the suppliers' level ([Rainy et al., 2012](#)). Social procurement is the process of generating "social value through purchasing and procurement processes" ([Lowe, 2013](#)). It is used by governments, which claim that public decisions must include some social values, to maximize social impacts and benefits for the community ([Lowe, 2013](#)). Companies that do not execute logistics services and externalize this process can effectively generate pressure on logistics providers with their purchasing power, which can be considered a sort of positive discrimination favoring only those providers that assure some social standards in their working conditions. For this purpose, [Rainy et al. \(2012\)](#) proposed a scale capable of measuring socially responsible supplier development to deal with the suppliers' ethical problems in Chinese manufacturing firms.

Shifting the perspective from social sustainability to social responsibility in the logistics sector, many authors refer to the concept of corporate social responsibility (CSR), which is defined as a company's commitment to putting social sustainability into practice ([Ciliberti et al., 2008](#)). CSR is an integral part of social sustainability and represents the integration of ethical issues in the business macro strategy ([Moon, 2007](#)). [Carter and Jennings \(2002\)](#) found in their study on logistics social responsibility (LSR) that social sustainability purchasing power directly impacts supplier social performance. Another study analyzes different logistics processes for developing a taxonomy of LSR practices ([Ciliberti et al., 2008](#)). They considered social issues related to transportation through the analysis of non-financial reports and classified companies based on the adoption rate of such LSR practices, such as purchasing from suppliers who guarantee some labor conditions to workers, purchasing from minority suppliers, and verifying security issues in suppliers' plants. In contrast, considering logistics service providers companies, [Piecyk and Björklund \(2015\)](#) found that the company's size and the current use of a specific reporting tool for communicating the issues related to logistics social responsibility may affect the level of corporate social responsibility in the logistics sector. While social procurement and logistics social responsibility research have considered several qualitative indicators for assessing social sustainability, none of them have been specifically applied to the social procurement of food logistics services.

Despite the variety of models proposed for social sustainability, only a few are related to the logistics sector, and even fewer to the food logistics sector. Furthermore, none of these models proposes a comprehensive framework to assess social sustainability performance in food transportation or in the social procurement of food logistics services ([Table 1](#)). The table proposed below emphasizes the fundamental concepts that underpin each literature contribution and collectively contribute to the overall conceptualization of the methodology.

Considering the relevant aspects identified in the existing literature, also depicted by [Fig. 1](#), this research focuses specifically on these within the context of a specific case study. The objective of this manuscript is to identify qualitative and quantitative dimensions, as well as relevant indicators, for measuring social sustainability within the food logistics industry. Through conceptualization, this study aims to develop a methodological approach that is specifically proposed for and adopted to the logistics business division of a south European food processing company. The focus is on assessing the social procurement practices at the level of logistics suppliers.

3. Research context

This research focuses on a case study of a south European food company that operates in the canteens sector. In 2020, the company's turnover exceeded 35 million euros, employing about 1500 workers. This firm outsources logistics and distribution services to several food logistics providers. This selected company has developed different methods to measure the social sustainability of its internal performances, but it does not have information concerning its logistics

Table 1
Summary of literature contributions.

Paper checklist	Economic and environmental sustainability	Quantitative assessment of social sustainability	Qualitative assessment of social sustainability	Social sustainability in transportation/ logistics	Food logistics	Social procurement	Social procurement of food logistics
Labuschagne et al. (2005)	X	X	X				
Rajak and Vinodh (2015)		X	X				
Popovic et al. (2018)		X					
Mani et al. (2016)		X	X				
Bandeira et al. (2018)	X	X		X			
Rajak et al. (2016)	X	X	X	X			
Kumar and Anbanandam (2019)		X	X	X			
Sarkis et al. (2010)			X	X			
Rainy et al. (2012)		X	X	X		X	
Lowe (2013)		X		X		X	
Ciliberti et al. (2008)	X	X	X	X		X	
Moon (2007)						X	
Piecyk and Björklund (2015)				X		X	
Carter and Jennings (2002)			X	X		X	
Djekic et al. (2018)	X	X		X	X		
Malak-Rawlikowska et al. (2019)	X	X		X	X		
Köseli et al. (2023)	X	X		X	X		

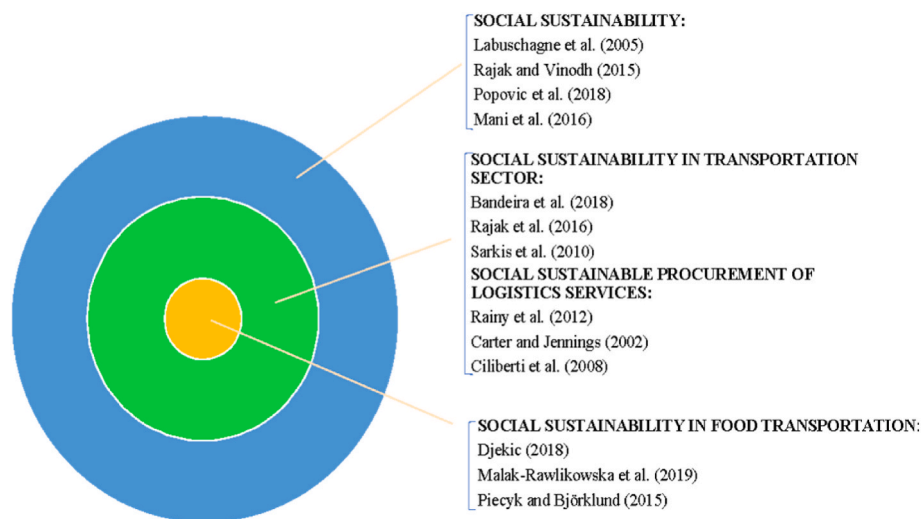


Fig. 1. Literature references classified by targets.

providers.

For this purpose, the current paper aims to assess the social sustainability performances of these food logistics service providers developing a methodology specifically for this purpose. The decision to apply this method at the level of 3 PL (Third-Party Logistics) is primarily motivated by the objective of focusing the analysis on companies involved in the transportation, distribution, and storage of food products. Consequently, the methodology proposed is implemented from a social procurement perspective.

The case study selection is based on different criteria illustrated in Fig. 2. The first one is the company’s awareness of sustainability issues, which voluntarily implements sustainability practices related to its business. Another criterion is the regular production of a sustainability report. Moreover, the company implemented their own method to measure social sustainability internal performance, using internationally recognized tools. Finally, the continual renewal of food procurement regulations requires appropriate methods for assessing social sustainability considering not only the holding of social certifications at

the company level but also the qualification of suppliers upstream in the supply chain.

In this context, and in relation to the company’s characteristics and needs, the methodology developed was implemented in terms of social procurement, analyzing the social performances of its 3 PL. It is important to note that the application of this methodology is not carried out for the purpose of selecting suppliers, but rather to profile their performance in line with the company’s corporate values and strategies. The following section aims to present the methodology developed for the specific case study outlined in this manuscript.

4. Materials and methods

The main goal of the present study is to evaluate and quantify the degree of social sustainability of the selected case study food company operating in the food logistics industry, particularly in relation to its employees and customers. The methodology employed for this research is illustrated in Fig. 3.

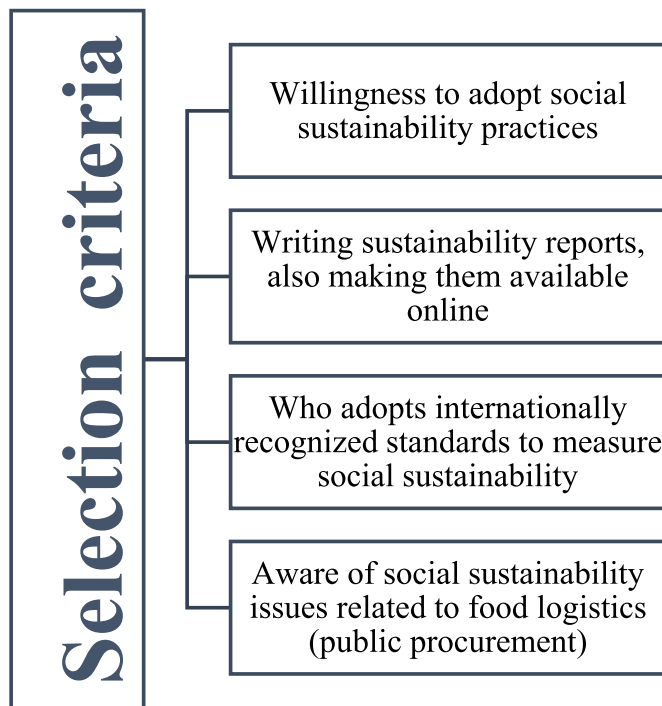


Fig. 2. Case study selection criteria.

Based on the literature analysis, a methodology was developed for assessing the social sustainability of the food logistics sector. This model is intended to measure the performance of companies or logistics suppliers regarding social sustainability. The methodology was based on the most cited papers that deal with the main different dimensions of social sustainability to quantify it in industries (step 1 in Fig. 3). Based on past research (Labuschagne et al., 2005; Rajak and Vinodh, 2015; Popovic et al., 2018; Mani et al., 2016), the proposed conceptual model is articulated in two levels (Fig. 4): the internal level, which concerns the social sustainability performance of the human resources within the food company, and the external level, which refers to the socially sustainable impacts on the local community in which the company operates (step 2 in Fig. 3). Similar indicators that indicate the same concept but under a different name were combined (e.g. gender balance, gender equality, female presence, step 3 of Fig. 3). Additionally, through model adaptation, the proposed method provides guidelines for implementing it in transportation industries that do not specifically deal with food or in other business divisions different from logistics (step 4 in Fig. 3). For each indicator, a unit of measure was determined (step 5 in Fig. 3). A methodology consisting of several dimensions and indicators was created for the case study. During this stage, several meetings with the company manager were useful in gaining a better understanding of the field of analysis and the indicators to be measured (step 6 in Fig. 3). The methodology proposed for the presented case study can also be applied partially, using only the internal or external level, or using only some indicators according to the context's complexity and data availability.

4.1. Internal stakeholder population

The first level, the internal stakeholder population, comprises six dimensions: characteristics and work welfare, health of employees, diversity and equal opportunities, training and lifelong learning, innovation practices, and human rights implementation and integration. The main purpose of the internal stakeholder population level is to assess the social sustainability performance of the logistics company. The proposed qualitative and quantitative variables enable comparison between workers' opinions and the company's social responsibility actions and

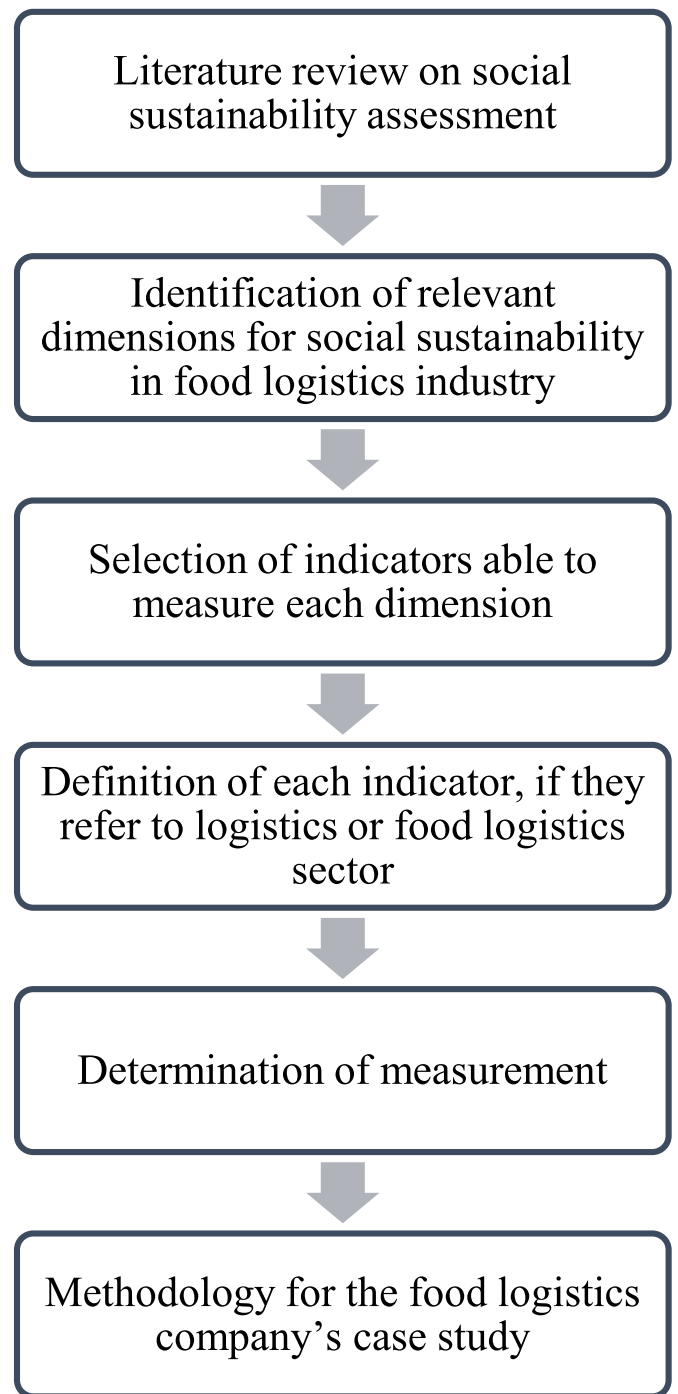


Fig. 3. Method adopted in the present research to develop the case study methodology.

strategies. Using qualitative variables, stakeholders' viewpoints can be collected to identify where intervention should be directed to strengthen potential or reduce complexities. In fact, it is possible that within the same company division, different work categories may be more or less penalized in terms of social sustainability.

The characteristics and work welfare dimension detects the corporate welfare policies adopted for the employees' well-being. The health of employees dimension measures the safety and health protection provided to operators when performing their work duties. The diversity and equal opportunities dimension provides an overview of the degree of workplace diversity in terms of gender balance, workers' nationality, religious affiliation, and the inclusion of disabled and disadvantaged

Social sustainability in food logistics



- Human resources inside the food logistics organization
- Effects on local community

Fig. 4. The two levels of social sustainability in the food logistics industry.

workers. The training and lifelong learning dimension captures the organization’s investment in workers’ training and education, including the hours of training imposed by law or additional hours provided. The innovation practices dimension refers to the strategies adopted by the company to constantly innovate its business model in response to technological innovations and the continuous improvement of sustainability production performances. The final dimension of the internal population stakeholder level considers the firms’ recognition and protection of fundamental human rights, allowing measurement of the different forms of discrimination in the workplace expressed through workers’ complaints.

The six dimensions of the internal stakeholder population can measure the social sustainability performance of food logistics companies, as well as logistics suppliers, in terms of social procurement.

4.2. External stakeholder population

As previously mentioned, the activity of a logistics company not only affects internal human resources but also produces some externalities, both positive and negative, for the local community in which the logistics source operates (Bandeira et al., 2018; Lindholm and Behrends, 2012; McKinnon et al., 2016). For this reason, it is useful to add an external level, which is able to analyze the main threats and opportunities for the local community to which the logistics company contributes in terms of social sustainability. The external stakeholder population level has only one dimension, namely external stakeholder community capital, and it is composed of one qualitative indicator. The proposed indicators allow the collection of data from citizens, local business companies, and other relevant stakeholders’ opinions about the negative externalities produced by the logistics source on the local environment, such as road congestion, perceived air pollution, and aesthetic degradation. In addition, the suggested indicators enable an analysis of the positive externalities to which the presence of the logistics source contributes in terms of perceived improvement in food security, job opportunities, and increased engagement in the local community. The following Table 2 illustrates the levels of social sustainability, along with the corresponding dimensions and indicators analyzed in the case study.

4.3. Score and representation of the social sustainability

The model implementation allows for the assignment of weights and the rating of the performance of each dimension of social sustainability on a scale from one to ten. Furthermore, the final score of each indicator

Table 2
Dimensions and indicators analyzed in the case study.

Levels	Dimensions	Indicators
Internal stakeholder population	Characteristics and work welfare	<ul style="list-style-type: none"> • Equal pay at the same level, • Wage level between genders, • Staff turnover, • Flexible work organization, • Corporate welfare actions, • Paternity leave
	Health of employees	<ul style="list-style-type: none"> • Accidents, • Health training and education
	Diversity and equal opportunities	<ul style="list-style-type: none"> • Management of cultural diversity in the workplace, • Number of working women, • Disabled employees, • Job placement of disadvantaged workers
	Training and lifelong learning	<ul style="list-style-type: none"> • Average hours of training per year per employee for logistics and distribution employees
	Innovation practices	<ul style="list-style-type: none"> • Innovation for improving competitiveness and sustainability for environmental sustainability, • Circular economy and policy against waste, • Innovation practice to support educational employment projects
	Human rights implementation and integration	<ul style="list-style-type: none"> • Discrimination against women of childbearing age, • Managing conflicts arising from discriminatory phenomena, • Overtime, • Evaluation of the entire supply chain
External stakeholder population	External stakeholder community capital	<ul style="list-style-type: none"> • Social engagement

identifies weaknesses that need to be improved and strengths that can be enhanced. The higher the final score, the greater the social sustainability performance.

Social sustainability score for food logistics company is given by Eq. (1):

$$\sum_{k=1}^n SSS_k^i \tag{1}$$

where, SSS_k^i is the level of social sustainability on a scale from one to ten for each dimension of the social sustainability k of the company i , which includes logistics service providers.

An example of graphical representation resulting from the model implementation is a spider diagram able to visually show strengths and weaknesses in relation to the social sustainability of suppliers acting as logistics service providers (Fig. 5).

4.4. Assigning values to the dimensions of the social sustainability

Several approaches could be adopted in order to assign weights to each indicator of every social sustainability dimension, based on the indicator typology (quali-quantitative), data accessibility, available resources, and other considerations determined by the corporate internal organization. Furthermore, the same indicator could be measured through several approaches. Among the different opportunities to weigh the indicator’s dimensions, some practical tools and approaches are proposed below:

- A survey assessment through a 5-point Likert scale (1-Strongly disagree, 5-Strongly agree) administered to privileged actors of the selected organization such as managers, operators, and executives (due to their role, type of job, or key relationship with other internal

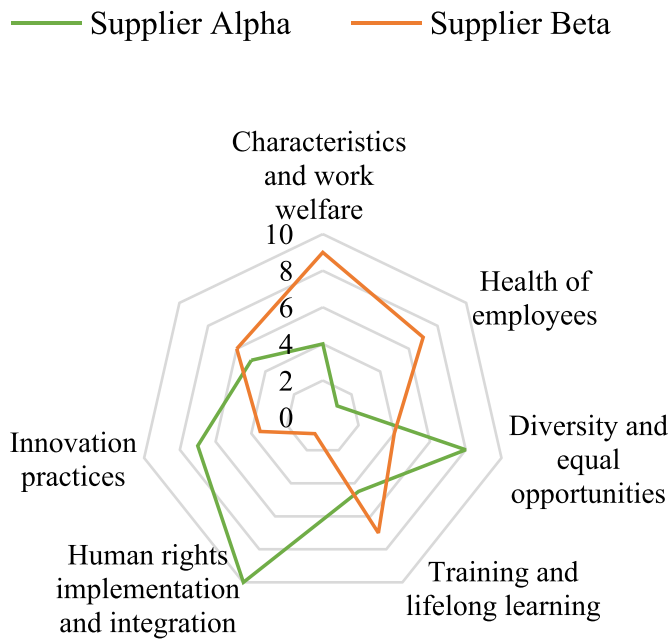


Fig. 5. Comparison between SSS of different logistics service providers.

and external stakeholders). Indeed, several studies have used the Likert scale to assess social sustainability issues (Carter and Jennings, 2002; Malak-Rawlikowska et al., 2019; e Large et al., 2013)

- In-depth interviews, in which key issues are a-priori-defined, but further information may emerge. This approach is particularly useful when key actors are identified since the degree of detail is highly accurate or also for identifying aspects that have not been previously considered and need to be further investigated (Carter and Jennings, 2002; Mani et al., 2016).
- Assessments of trends through national or regional statistical offices (such as data from regional agencies for environmental protection, data from Chambers of Commerce related to the employment rate, etc.)
- Analysis of the company’s sustainability reports (Ciliberti et al., 2008; Popovic et al., 2018) or further internal company statistics related to the adoption of international standards (SA8000, GRIs etc.)
- Survey administered to some privileged actors of the selected suppliers, such as managers, operators, and executives, if the methodology were implemented for 3 PL in terms of social procurement to assess their level of social sustainability and to evaluate the adherence between the buyer’s and supplier’s values

The present research used a survey assessment administered to some privileged actors of the suppliers. This choice was made after a comparative assessment of the proposed approaches, and this approach is distinguished by the best cost-benefit ratio for both the company and food logistics suppliers of the considered case study.

4.5. Social sustainability methodology implementation

The following section presents the four steps for the developed methodology implementation concerning the targeted case study, as the following:

1. Scoring system
2. Weighting system
3. Score aggregation
4. Survey development and data collection

The first phase of the methodology implementation involves the scoring system definition, which is crucial in measuring the level of social sustainability for each indicator. This research proposes two approaches:

- **Normalized score.** For some indicators, it may not be possible to determine the degree to which a logistics supplier is socially sustainable. The normalization method eliminates outliers by arranging all scores between the best and worst performers. Additionally, this method enables comparison of data even between significantly different companies. For example, as shown in Table 3, determining whether a supplier is socially sustainable or not with regard to the number of accidents is challenging because suppliers’ companies differ significantly in size and characteristics. To score each food logistics supplier for the “accident” indicator, the approach normalize allows normalizing the best and worst supplier results using the following Eq. (2):

$$\frac{x - x1}{x2 - x1} = \frac{y - y1}{y2 - y1} \tag{2}$$

Where, on the scale from 1(y1) to 10 (y2), x represents the observed value to normalize, x1 and x2.

denote the minimum and maximum value assumed by a supplier.

- **Band score.** This method proposes a different score band for each option selected by the supplier. The different score band represents the different degree of possession of the considered feature. For example, for the “health training and education” indicator (Table 3), a supplier can fulfil only the legal obligations, or in addition to this, it can implement voluntary actions, resulting in a higher score. A higher score means a higher degree of possession of that particular supplier’s health training and education feature.

The approaches used for each indicator of the case study are shown in Appendix B of this manuscript.

The second step of the methodology implementation is the weighting system for each social sustainable dimension (Table 4). The company assigned weights, varying from 1 to 10, to each analyzed dimension. The weighting system from 1 to 10 was decided accordingly to company managers’ preliminary meetings as it was considered more appropriate and familiar for practitioners who can more accurately assign a value to the various social sustainability components. This step is fundamental since, after conducting the survey, it will be possible to scale scores obtained by each food logistics supplier with the weight the company attributes to each dimension. This stage allows for analyzing the social performances of the company suppliers related to each dimension, specifically with the weight and importance that the company attributed to the social sustainability dimensions. Therefore, this analysis could highlight suppliers more aligned with the company’s values and strategies in terms of social sustainability. It is relevant to specify that weight attribution is the sole prerogative of the company. The higher the score the more important the dimension.

In the case study of the methodology application in this paper, the company selected for implementation attributes the following weights to each dimension related to social sustainability (Table 4).

The third stage of implementation is the score aggregation to obtain a final value. If a dimension consists of multiple indicators, an arithmetic

Table 3 Example of scoring system.

Level	Dimension	Indicator	Scoring system
Internal stakeholder population	Health of employees	Accidents	Normalized score
		Health training and education	Band score

Table 4
Dimensions' weights assigned by the case study company.

Dimensions	Weights assigned by the company (1–10)
Characteristic and work welfare	8
Health of employees	8
Diversity and equal opportunities	7
Training and lifelong learning	10
Innovation practices	8
Human rights integration and implementation	9
External stakeholder community capital	8

average determines the overall score. This value is then weighted with the weight that the company attributed to the dimension to which those indicators belong.

The last step of the proposed methodology is the survey development and data collection. The research tool proposed in this paper is a thirty-item questionnaire to assess the social sustainability performances of food logistics suppliers for the selected food company. Subsequently, through discussion with company experts, the social sustainability indicator categories were validated at two levels, seven dimensions and twenty-one indicators, as presented in Table 2. For each indicator, a question was developed to be submitted to the food logistics suppliers' managers. Preliminary meetings were conducted in May with these supplier managers to explain the study's macro-objectives to increase their engagement in completing the questionnaire. The involvement and engagement of managers were crucial in clarifying the questionnaire's purposes and producing reliable results, trying to limit any possible completion bias. The survey construction and the included questions were designed to be short-answerable, so as not to overburden the logistics and food distribution practitioners.

The questionnaire (full text is available in Appendix A of the manuscript) was sent via email to the five food logistics supplier managers selected as the most relevant and with the highest turnover for the case study company, all of whom replied by filling in an online form. Three months were given for managers to complete the questionnaire, with data collected from June to mid-August 2022. The related results and discussion are presented in the following section.

5. Results

This section presents the results obtained from analyzing the food logistics suppliers who responded to the questionnaire of the case study

company operating in the school and canteen sectors. The results are reported in two different sections. The current section aims to analyze the social sustainability performance of each food logistics supplier, while the next section aims to compare the suppliers.

With regard to the analysis of the social sustainability performance of each food logistics provider, Fig. 6 describes the final performance of each food logistics provider. For each provider, two different scores are reported: the score weighted with the company's dimensions weights and the score without any company's weights. As can be clearly seen, the use of weights given by the company raises the final score for all suppliers, except for supplier #1.

5.1. Supplier #1

The following subsection analyzes the results for supplier#1. What stands out from Fig. 6 is that supplier #1 is the most socially sustainable, achieving the highest score of 6.35. However, without any weights, this supplier's score value decreases by 0.14 points. This is because supplier #1 performs better in dimensions to which the company assigns a higher score and worse in dimensions to which the company assigns less importance. The high value of the final score suggests that supplier #1 is aligned with the social sustainability values and strategies of the company.

The overall performance of food logistics provider #1 is quite remarkable in all dimensions (Fig. 7), collecting a score of ten in the dimension "training and lifelong learning", which is the only dimension to which the company attributed a weight of ten.

Indeed, supplier #1 is the only one that provides extra hours in addition to the legally required training for its employees. However, its lowest performance is in the dimension "innovation practices" since it has no internal sustainability strategies or policies to mitigate the environmental impact generated by its operations. Despite being the worst performing dimension for supplier #1, it is still better compared to other suppliers who perform worse in this dimension, which testifies to the overall good performances of supplier#1 in all social sustainability dimensions.

Regarding gender issues, although 33% of the supplier's workers are women, only a few of them are engaged in operational activities. Moreover, a remarkable disparity exists between women and men in maternity or paternity leave, favoring the latter. This scenario is also confirmed by the fact that slightly less than half of the women employed are not of childbearing age.

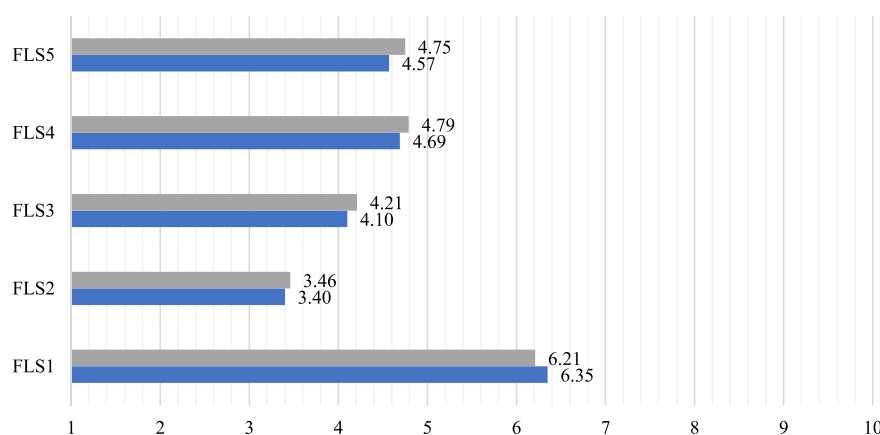


Fig. 6. Weighted and not weighted score.

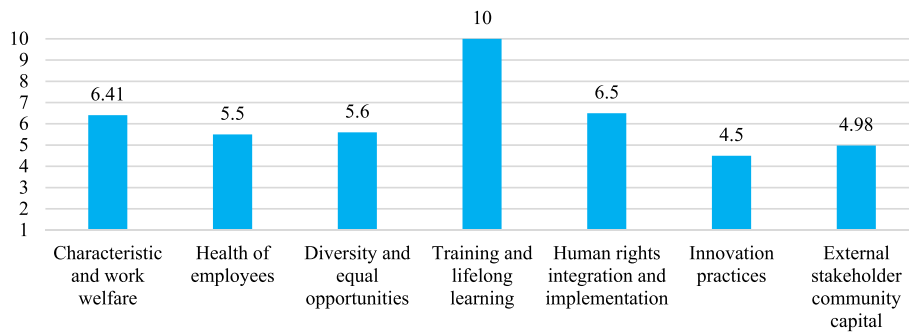


Fig. 7. Assessment of the score dimensions of Supplier #1.

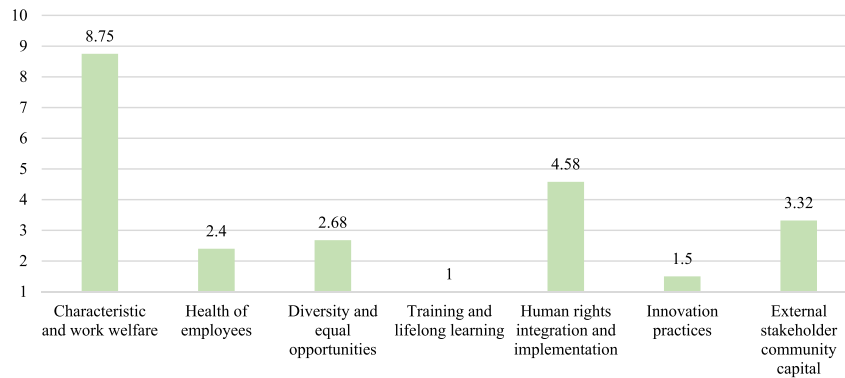


Fig. 8. Assessment of the score dimensions of Supplier #2.

5.2. Supplier #2

Moving on to the performance of supplier #2, as shown in Fig. 6, it has the lowest score of 3.40. This is due to the low scores it collects in almost all dimensions (Fig. 8), except for “characteristics and work welfare”, in which its performance is one of the highest among the different suppliers.

One of the worst performances of supplier #2 is in the “health of employees” dimension. It not only has a worrying accident rate but also states that it does not carry out all the employee health and safety training activities required by law. Furthermore, supplier #2 scores very poorly in indicators of the “innovation practices” dimension, claiming to not have internal sustainability policies and agreements with third parties to promote circular economy. Finally, female presence in the company is 18% of the total number of employees, and although many women are engaged in operational activities, all of them are of childless age.

5.3. Supplier #3

Analyzing the performance of Supplier #3, as reported in Fig. 6, it collects a score of 4.10, with relevant performances in the “characteristics and work welfare” and “health of employees” dimensions. Despite the good score of 8.33 for the first dimension, supplier #3 is the only one that states not to know the regulation on minimum wages, scoring low in this indicator (Fig. 9). Concerning the dimension of “health of employees”, supplier #3 records a low accident rate and provides adequate training for its employees, demonstrating a good balance between security training and the adoption of preventive measures.

In terms of gender issues, this supplier is distinguished by a female presence of 54% of the employees, 84% of whom are employed in operational activities. Moreover, this supplier presents absolute equality between men and women with regard to access to paternity and maternity leave, in fact in 2021 two women and two men benefitted from it.

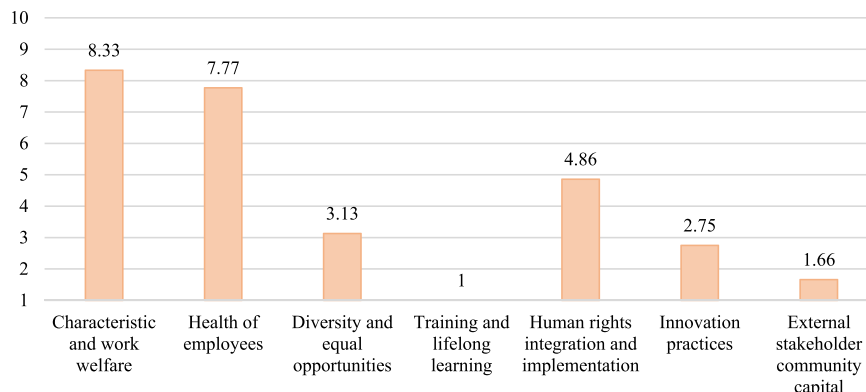


Fig. 9. Assessment of the score dimensions of Supplier #3.

One of the main weaknesses of this supplier is its poor engagement in yielding benefits for the external community and the adoption of sustainability practices.

5.4. Supplier #4

With respect to food logistics supplier #4, a closer inspection of Fig. 6 shows a score of 4.69, testifying a quite well performance.

In particular, for “health of employees” dimension, this supplier achieves a score of 9.0, the highest among all the suppliers evaluated. Indeed, it did not experience any accidents during 2021 while carrying out all the mandatory training activities to safeguard employee health (Fig. 10). Although in the “human rights implementation and integration” dimension it performs quite well, concerning gender issues the female presence is very low, indeed it employs only a woman.

5.5. Supplier #5

Turning now to the last supplier, as demonstrated by Fig. 6 the final score for supplier #5 is 4.57, well-performing in each dimension. In particular, this supplier outperforms the others considering the “diversity and equal opportunity” dimension. In fact, this organization hired the highest number of women engaged in operational tasks. Furthermore, in the dimension “external stakeholder community capital” supplier #5 gained a score of 4.98, which testifies its commitment to fostering the community in which it operates.

However, despite the good performance in the diversity and equal opportunities dimension, supplier #5 scored 2.17 in the indicator

measuring equity of access to maternity and paternity leave. In fact, despite there being a significantly higher number of men than women in the company, more women than men benefit from maternity leave. Furthermore, although the percentage of women in the company is 33% of the total number of employees, all of the female presence are at a non-fertile age (see Fig. 11).

6. Discussion

Having discussed how each individual supplier performed in the dimensions and indicators of the methodology developed, this second section provides a comparison among them to conduct a more profitable analysis of the general performance and to allow for a better understanding of the functioning of the methodology itself. This in-depth study allows for an analysis of the dimensions that collect generalized good and low scores among suppliers. The results of the comparison among suppliers are summarized in Fig. 12. This figure illustrates that each supplier covered an area on the graph, and the size of the area corresponds to their score. The larger the area on the graph, the higher the supplier’s score. Fig. 12 clearly shows that supplier #1 is the best performer, covering the widest area on the graph, while supplier #2 obtains the lowest score, highlighted by the reduced area on the graph.

The figure also highlights the dimensions in which suppliers performed well and those in which they recorded low scores, proposing strengths and weaknesses for each of them. This Figure shows that the peaks are closely related to the dimension “characteristics and work welfare” with a mean of 8.0 value. However, supplier #1, which obtained the highest value, is the worst performer in this dimension

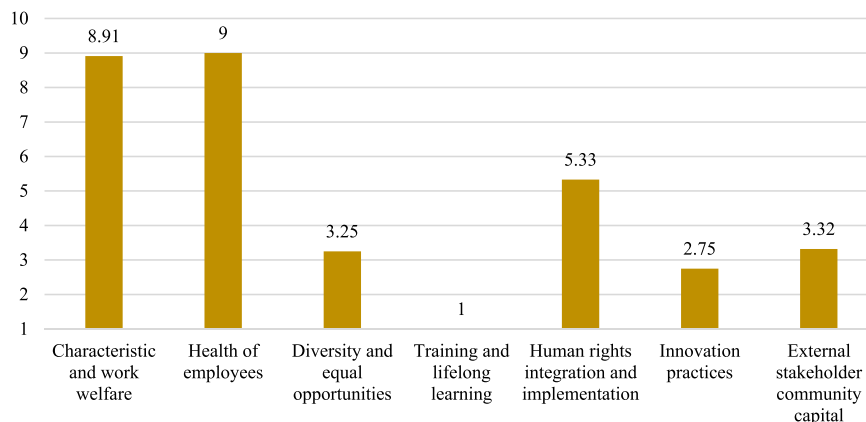


Fig. 10. Assessment of the score dimensions of Supplier #4.

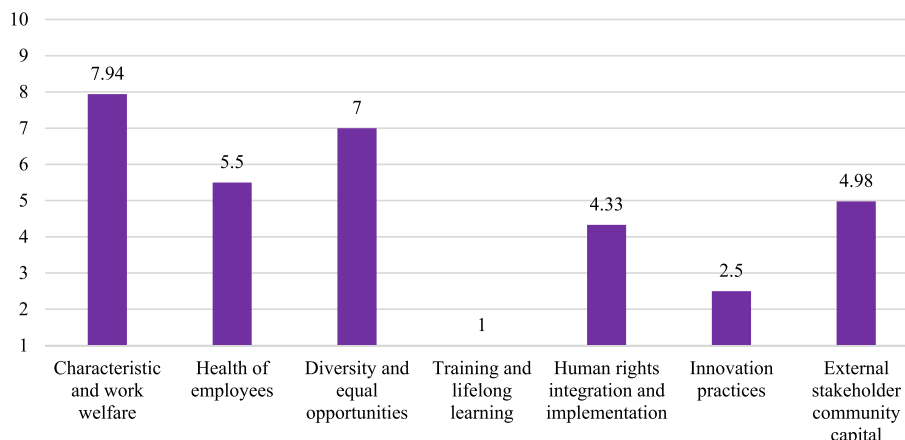


Fig. 11. Assessment of the score dimensions of Supplier #5.

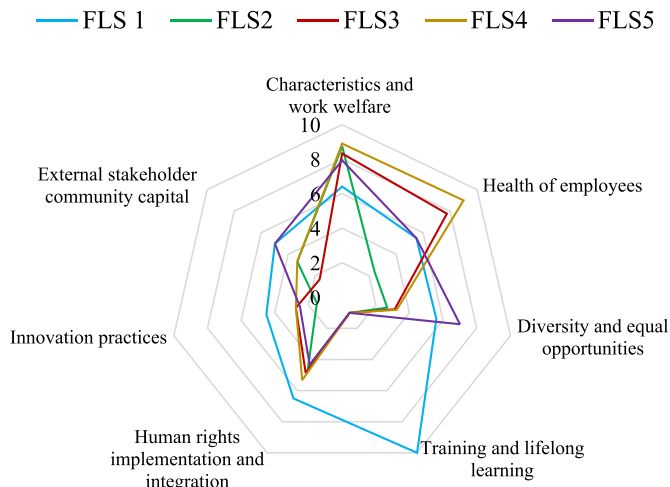


Fig. 12. Assessment and comparison of food logistics suppliers detailed at dimension level.

compared to the others, and is distinguished by the highest turnover rate.

In contrast to Rajak and Vinodh’s (2015) results, and in accordance with Lerberg Jorgensen and Steen Knudsen (2006) findings, the “health of employees” dimension collects a mean value of 6.0 among respondents, representing a further dimension in which most of the suppliers perform well. A similar pattern is experienced by “human rights implementation and integration” dimension, with a mean value of 5.12 among suppliers, consistent with the results of Rajak and Vinodh (2015) and Lerberg Jorgensen and Steen Knudsen (2006). On the contrary, the social sustainability dimensions that score lowest for all suppliers are “diversity and equal opportunities”, “external stakeholder community capital”, and “innovation practices”, which respectively obtain means of 4.3, 3.6, and 2.8. This value represents a low level of engagement of all suppliers concerning actions of valuing and protecting diversity, to mitigate their impact on the environment, and a lack of focus on producing benefits for the local community in which these firms operate. This poor performance in external stakeholder community capital is also confirmed by Rajak and Vinodh’s (2015) work. The only dimension in which all suppliers perform poorly, except for supplier #1, is “training and lifelong learning”, as all suppliers provide their employees with the mandatory training hours only required by law. This result is in line with Rajak and Vinodh’s (2015) study, in which the “growth of skill and knowledge attribute performs poorly”.

In terms of the “diversity and equal opportunities” dimension, Fig. 12 indicates that supplier #5 has the highest score, as it employs has the highest number of women in operational tasks. Supplier #1 follows closely behind with a score of 5.6, due to its employment of the highest number of workers from protected categories.

Regarding the “health of employees” dimension, supplier #2 has the lowest score of 2.4. This is due to its high accident rate and failure to carry out all legally required worker safety training activities. On the other hand, suppliers #1 and #5 both score 5.5, through a different combination of indicators. Supplier #1 has a high accident rate despite carrying out all general and specific training, while supplier #5 reports a low accident rate despite not carrying out training on job-specific risks.

For the “human rights implementation and integration” dimension, suppliers #2 and #5 have the lowest values of 4.58 and 4.33 respectively. These suppliers perform poorly in the “discrimination against women of childbearing age” indicator, as they only employ women of non-fertile age. Supplier #1 also scores low in this indicator, although it performs well in the other indicators belonging to the dimension.

Finally, although all suppliers have relatively low overall performance in the “innovation practices” dimension, supplier #1

distinguishes itself with the highest level of engagement in implementing anti-waste policies and promoting the circular economy.

So far, this section has focused on the performance of individual suppliers and compared their scores. The following subsection will discuss the relationship among indicators, dimensions, and indicators and dimensions. In fact, in some cases, dimensions and indicators are related to each other.

The empirical results show that suppliers who perform well in the characteristics and work welfare dimension also score well in the health of employees dimension. This trend is presented in Fig. 13, which highlights that this relation holds for all suppliers, except supplier #2. This positive relation is explained by the supplier’s concern about the health of its employees, both physical and mental.

The case study results also reveal that suppliers’ lack of attention to producing benefits for the local community corresponds to a lack of attention to mitigating the impacts on the surrounding territory and natural environment. As proposed in Table 5, low values in the indicator “Circular economy and policy against waste” correspond to low commitment to producing benefits for the local community, as measured by “external stakeholder community capital” dimension. This is reflected in the scores of supplier #2 (which scores 2.0 in the indicator and 3.32 in the dimension), supplier #3 (3.0 and 1.66), supplier #4 (3.0 and 3.32) and supplier 5 (3.0 and 4.98).

Moreover, concerning the “external stakeholder community capital” dimension, the data gathered also suggests that suppliers #1 and #5, who collect the highest score, are also those who assess the working condition of operators along the supply chain from which in turn they source. Both suppliers score 10.0 in the evaluation of the supply chain indicator and 4.98 in the “external stakeholder community capital” dimension, while the others score an average of 5.0 in the evaluation of the supply chain and 1.66 (supplier #3) and 3.32 (suppliers #2 and #4) in the dimension. The analysis of the suppliers’ questionnaire responses also revealed that firms more engaged in producing benefits for the local community are those that employ the largest number of workers from protected categories. This outcome can be clearly identified in Fig. 14, in particular for food logistics suppliers #1 and #5, compared to others. The company’s engagement with the community may have helped raise awareness of the social impacts of hiring workers from protected categories.

With regard to gender issues, a positive correlation exists between the high number of women engaged in operational tasks and an increased level of discrimination against women of childbearing age in recruitment, where scores close to 1 indicate high levels of discrimination. As Fig. 15 proposes, for suppliers that employ a high number of women (suppliers #5 and #2) the level of discrimination is higher, while for suppliers in which the number of women engaged in operational tasks is limited (suppliers #1 and #4) the level of discrimination is lower. This pattern is probably and unfortunately determined by the approach that firms have in employing a remarkable number of women in operational activities at non-fertile ages to prevent them from benefiting from maternity leave. Within this awful scenario, supplier #3 represents an exception, since it not only employs a lot of women in operational tasks but is also distinguished by low levels of discrimination.

The methodology developed in this study provides a comprehensive analysis of the social sustainability performances of the five food logistics suppliers, highlighting their strengths and weaknesses and allowing for a comparison between them. It provides insights into how well each social sustainability dimensions and indicators are adopted within the logistics suppliers.

The proposed approach enables the straightforward objectification and quantification of the social performance of suppliers, facilitating the implementation of social sustainability measures. Furthermore, thanks to its validation, it could also be adopted by other companies, following contextual adaptation, to ensure high standards of social sustainability in their external provision.

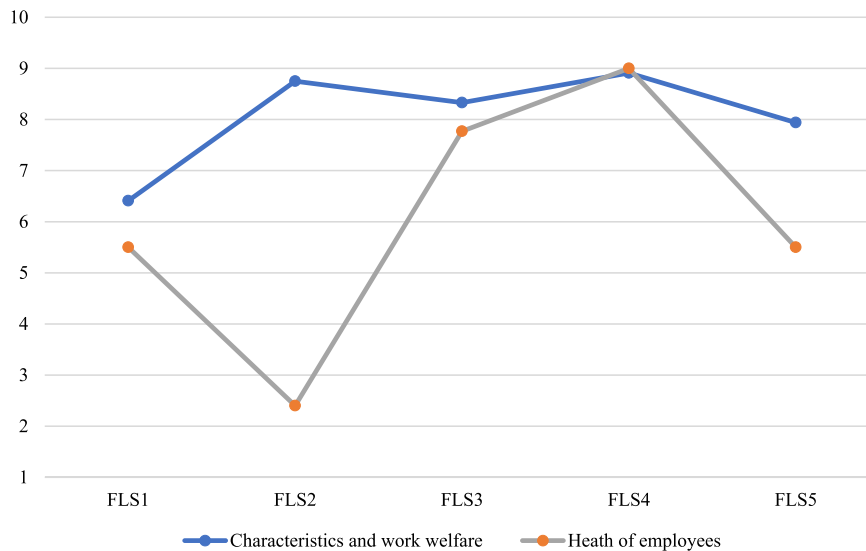


Fig. 13. Relationship between Characteristics and work welfare and Health of employees.

Table 5

Relationship between values assumed by indicator Circular economy and policy against waste and dimension External stakeholder community capital.

Supplier	Indicator	Dimension
	Circular economy and policy against waste	External stakeholder community capital
FLS1	8,0	4,98
FLS2	2,0	3,32
FLS3	3,0	1,66
FLS4	3,0	3,32
FLS5	3,0	4,98

The scientific value of the developed methodology lies in its leveraging to assess social sustainability for the case study company operating in the food logistics industry. In fact, the methodology is created, tested and subsequently adopted by the company to conduct an evaluation of the social sustainability performance of its logistics suppliers.

7. Conclusions

The main goal of this manuscript is to identify dimensions and indicators for social sustainability measurement in the food logistics industry. This research proposes a methodological approach aimed at measuring social sustainability within a specific case study of a food processing company in southern Europe. To achieve this, a specific methodology is developed, and an empirical analysis is carried out to evaluate the social sustainability performances at the logistics suppliers' level. A 30-item survey is submitted to the main food logistics suppliers of the case study's company. Each dimension is weighted with the importance that the company attributed to each dimension, to characterize suppliers based on the company's values and strategies. The findings of the study suggest that the dimensions in which suppliers perform well are: "characteristics and work welfare", "health of employees", and "human rights implementation and integration", respectively with remarkable means of 8.0, 6.0, and 5.12. On the contrary, the social sustainability dimensions that score the lowest for all suppliers are

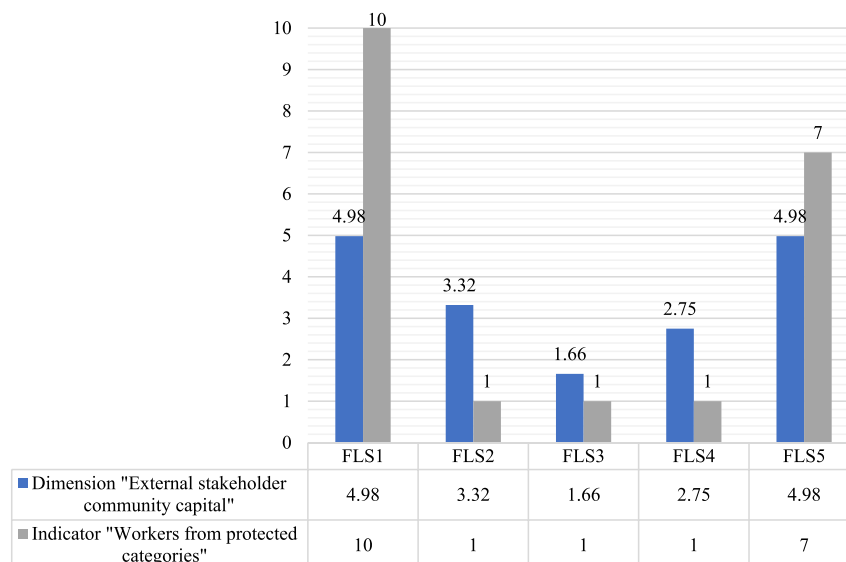


Fig. 14. Relationship between External stakeholder community capital and Workers from protected categories.

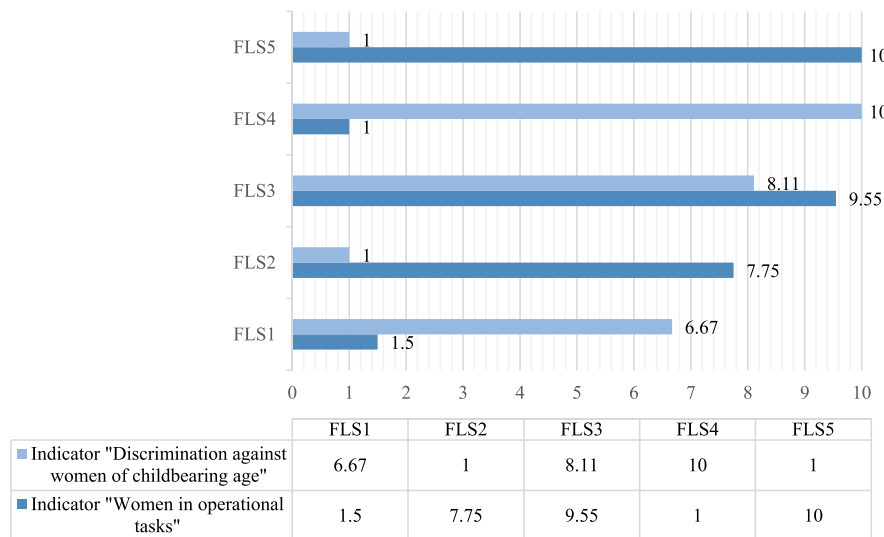


Fig. 15. Relationship between values assumed by indicators Discrimination against women of childbearing age and Number of women in operational tasks.

“diversity and equal opportunities”, “external stakeholder community capital”, and “innovation practices”, which respectively obtain means of 4.3, 3.6, and 2.8. The main contributions of the present study could be summarized as follow:

- The development of a methodology composed of 2 levels, 7 dimensions and 21 indicators
- A flexible methodology that can be replicated also in other types of enterprises, not only those dealing with food
- A study that contributes to existing knowledge of social sustainability in the food logistics sector
- A quali-quantitative methodology for detecting the performance of social sustainability in food logistics or in the social procurement of food logistics services

A limitation of this study, which should guide future studies, is the possibility of a social-desirability bias guiding suppliers in answering the survey, which has been already partially addressed by making the respondents’ data completely anonymous. Another limitation of the study is that it is solely a case study, and generalizing the results should be done with caution. Future research could expand our results by attributing weights to each indicator in addition to every dimension, which could lead to a more detailed analysis as the company may attribute different importance to indicators parts of the same dimension. In addition, another possible future development is to integrate into the weighted method an element that is able to take into account that different dimensions measured with a different number of indicators might influence differently the overall social sustainability value, as well as a sensitivity analysis to assess how variation in the dimensions’ weight affects the final score.

Moreover, an interesting avenue for future development could be the comparison of the methodology developed for the case study proposed in this research with other internationally recognized social sustainability tools, such as SAFA, GRI’s, ISO26000, S-LCA and others. In addition, in future developments, we aim to complement the methodology used with multicriteria techniques and fuzzy techniques to refine the evaluation. This would eventually improve and further develop the proposed methodology to evolve it to the level of an indicator no longer related only to a specific case study but with sufficient generalization content to be applicable to different study contexts. This would also enable an assessment of the strengths and weaknesses of each method considered and would facilitate the selection of the most appropriate

approach for each research context considered.

The findings of this study have several practical implications in terms of the sustainability of the food supply chain. The implementation of this methodology to the case study of a food company could be crucial for developing internal policies and interventions to enhance working conditions and corporate image. This could be a key point in developing business strategies to investigate how a selected logistics supplier’s chain could affect consumer and buyer behavior. The application of this methodology at the company’s supplier level serves as a governance tool for the company aiming to ensure transparency and, simultaneously, scientific rigor in the evaluation of its suppliers. The implications arising from the application of this methodology go beyond merely understanding the obtained results and charting the path for potential improvement actions; they also translate into a moment of reflection that could lead to decisions for a different allocation of resources. The very application of this methodology has the potential to trigger decision-making processes capable of bringing about change. In conclusion, the methodology proposed in this study can be revised for a specific case study focusing on food companies that prioritize strong internal standards of social sustainability. Additionally, it can be extended to examine their external supply chains, providing insights into crucial aspects of the food supply chain and logistics supply for retailers, civil society, and academics. This approach would facilitate the alignment between the imperative for action stemming from the global sustainability challenges addressed by SDGs and the social sustainability standards set forth by the food companies involved in this particular case study.

CRedit authorship contribution statement

Francesco Pilati: Conceptualization, Methodology, Investigation, Validation, Resources, Writing – review & editing, Supervision, Project administration, Funding acquisition. **Francesca Di Stradis:** Conceptualization, Methodology, Software, Validation, Formal analysis, Data curation, Writing – original draft, Visualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

entitled “CrownFood - Sustainable food networks and digital platforms beyond Covid-19” admitted for funding by the University of Trento (Italy) through the call “Strategic academic projects 2020”.

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Appendix A. 30-item survey

Level	Dimensions	Indicators	Survey questions		
Internal stakeholder population	Characteristics and work welfare Weight = 8	Equal pay at the same level	<ul style="list-style-type: none"> ● Does your company respect the sector minimum wages? <ul style="list-style-type: none"> - Yes - No - I do not know the legislation ● In your company, are there pay differences between men and women for the same job performed? <ul style="list-style-type: none"> - Yes - No ● Excluding seasonal workers rehired during the year, what is your company’s net turnover rate? <ul style="list-style-type: none"> - Less than or equal to 5% - Between 5% and 22% - More than 22% ● In urgent or change-order situations, how successfully does your company manage unexpected events? <ul style="list-style-type: none"> - Almost all the time (between 80 and 100% of the time) - Quite often (between 50 and 70% of the time) - Sometimes/rarely (between 10 and 40% of the time) ● Select the corporate welfare actions undertaken by your company in order to protect the working well-being of employees: <ul style="list-style-type: none"> - Smart working - Flexibility of working hours - Family/family leaves (children, elderly, etc.) - Possibility to reduce working hours for a period - Possibility of transfer hours with the Hours Solidarity Bank - Company loan to employees - Conventions and discounts - Company kindergarten - Company awards for achievements 		
		Wage level between genders			
		Staff turnover			
		Flexible work organization			
		Corporate welfare actions			
		Health of employees Weight = 8	Paternity leave	<ul style="list-style-type: none"> ● Indicate the absolute number of women and men employed in the logistics and transport sector who benefited from maternity/paternity leave during the year 2021 <ul style="list-style-type: none"> - Absolute number of women beneficiaries of maternity leave - Absolute number of men beneficiaries of paternity - Not applicable (no such request has been made) ● Indicate the number of accident days and total working days that affected your company’s employees referring to the year 2021 <ul style="list-style-type: none"> - Number of total accident days 2021 - Number of total working days 2021 ● Select the actions in which your company is committed to employee training and education <ul style="list-style-type: none"> - Training activities for job-specific risks - General and specific training (law 81/08) - Possession of goods transport licences - Extra training activities in addition to legal obligations 	
	Accidents				
	Health training and education				
			Diversity and equal opportunities Weight = 7	Management of cultural diversity in the workplace	<ul style="list-style-type: none"> ● If foreign workers are present, does the company guarantee equal access to information by having dedicated documentation available in different languages? <ul style="list-style-type: none"> - Yes - No - There is no foreign worker ● Indicates the absolute number of regularly employed women (fixed-term, open-ended, part-time, full-time) performing an operational job <ul style="list-style-type: none"> - Absolute number of women in operational position - There are no women in operational positions ● Indicate the absolute number of disabled workers (68 law) regularly employed in your company <ul style="list-style-type: none"> - Number of disabled workers employed__ - There are no disabled workers employed in the company ● Indicate the absolute number of workers belonging to disadvantaged social categories regularly employed in your company.
	Number of working women				
Disabled employees					
Job placement of disadvantaged workers					

(continued on next page)

(continued)

Level	Dimensions	Indicators	Survey questions
			<p>*Where disadvantaged social groups include drug addicts, alcoholics, minors in working age with family difficulties, prisoners admitted to alternative measures to detention</p> <ul style="list-style-type: none"> - Number of workers belonging to disadvantaged social categories - There are no workers belonging to disadvantaged social categories within the company
	Training and lifelong learning Weight = 10	Average hours of training per year per employee for logistics and distribution employees	<ul style="list-style-type: none"> ● Please indicate below the hours of training for employees in the logistics and transport sector, referring to the year 2021 <ul style="list-style-type: none"> - Total compulsory training hours provided in the year 2021 for workers in the logistics and transport sector __ - Total training hours provided in the year 2021 for workers in the logistics and transport sector
	Innovation practices Weight = 8	Innovation for improving competitiveness and sustainability for environmental sustainability	<ul style="list-style-type: none"> ● With respect to sustainability, the company: <ul style="list-style-type: none"> - Complies with the requirements of UNI EN ISO 14001 (environmental management) - Implements strategies in accordance with the UN Sustainable Development Goals - Implements strategies in accordance with GRI's standards - Drafts a sustainability report - Implements communication policies with local stakeholders
		Circular economy and policy against waste	<ul style="list-style-type: none"> ● In view of the raw material you use, does your company plan recovery/recycling activities through anti-waste policies or implement activities for promoting the circular economy? Please select below all activities in which the company is actively involved. <ul style="list-style-type: none"> - Packaging recovery/recycling - Waste and losses recovery/recycling - Forms of recycling of energy sources used for production (water, energy) - Agreements with third parties for the disposal of surplus food or raw materials
		Innovation practice to support educational employment projects	<ul style="list-style-type: none"> ● In addition to the possible fulfilment of the legal obligation (see question n. 11), is the company active in the following social inclusion educational projects aimed at the employment of people with disabilities? Tick the box next to the answer. <ul style="list-style-type: none"> - Educational projects aimed at inclusion in which the company is personally involved - The company provides financial support to third-party cooperatives involved in such projects - No, the company is not active on this front
	Human rights implementation and integration Weight = 9	Discrimination against women of childbearing age	<ul style="list-style-type: none"> ● Indicate the absolute numbers of women employed in the last 5 years under 30 years old and over 50 years old <ul style="list-style-type: none"> - N women under 30 years old hired in the last 5 years - N women over 50 years old hired in the last 5 years
		Managing conflicts arising from discriminatory phenomena	<ul style="list-style-type: none"> ● Please select below all activities in which the company is actively involved in order to manage possible conflicts arising from incidents of discrimination: <ul style="list-style-type: none"> - Possibility of reporting the event in different languages - Providing information on how to make reports and complaints at the time of recruitment - Handling any complaints/reports of discrimination incidents while guaranteeing the anonymity of the person concerned - The company is not active on this front
		Overtime	<ul style="list-style-type: none"> ● The company guarantees that: <ul style="list-style-type: none"> - Overtime work is regulated according to the relevant national collective bargaining - Overtime work is regularly paid - Overtime work is voluntary and is not imposed on the employee in any way, either through verbal coercion or bullying if the employee refuses to work overtime - Option to convert overtime hours into an Hours Solidarity Bank
		Evaluation of the entire supply chain	<ul style="list-style-type: none"> ● With reference to the agri-food products that your company markets, do you know whether these raw materials are subject to controls and checks on working conditions along the supply chain as required by the Minimum Environmental Criteria (CAM)? <ul style="list-style-type: none"> - Yes - No - I do not know/do not know the legislation
External stakeholder population	External stakeholder community capital Weight = 8	Social engagement	<ul style="list-style-type: none"> ● Does the company engage in social initiatives and projects that produce benefits in the local community in which it operates? Please select below all activities in which the company is actively involved. <ul style="list-style-type: none"> - Grants to local sports activities - Solidarity area - Aid to populations abroad - Incentives for health initiatives - Incentives for animal protection - Socio-cultural activities - Other - The company is not active on this front

Appendix B. The scoring system approach used for each indicator of the case study

Levels	Dimensions	Indicators	Scoring system
Internal stakeholder population	Characteristics and work welfare	Equal pay at the same level	Band score
		Wage level between genders	Band score
		Staff turnover	Band score
		Flexible work organization	Band score
		Corporate welfare actions	Band score
	Health of employees	Paternity leave	Normalized score
		Accidents	Normalized score
	Diversity and equal opportunities	Health training and education	Band score
		Management of cultural diversity in the workplace	Band score
		Number of working women	Normalized score
	Training and lifelong learning	Disabled employees,	Normalized score
		Job placement of disadvantaged workers	Normalized score
	Innovation practices	Average hours of training per year per employee for logistics and distribution employees	Normalized score
		Innovation for improving competitiveness and sustainability for environmental sustainability	Band score
	Human rights implementation and integration	Circular economy and policy against waste	Band score
Innovation practice to support educational employment projects		Band score	
Discrimination against women of childbearing age		Normalized score	
Managing conflicts arising from discriminatory phenomena		Band score	
Overtime		Band score	
External stakeholder population	External stakeholder community capital	Evaluation of the entire supply chain	Band score
		Social engagement	Band score

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