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From Social Accountability 8000 (SA8000) to Social Organisational Life Cycle Assessment (SO-LCA): An Evaluation of the Working Conditions of an Italian Wine-Producing Supply Chain †

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Abstract: The Life Cycle Thinking (LCT) methodologies allow the entire supply chain of wine to be analysed via a systematic approach. Social Organisational Life-Cycle Assessment (SO-LCA) extends the product perspective of Social Life Cycle Assessment (S-LCA) to a more complex view of the organisation, assessing the entire organisation or part of it (e.g., facilities, geographical area, brands) from a life cycle perspective. It is implemented via the technical framework adopted by Organisational LCA (O-LCA) and S-LCA and according to ISO 14040:2020 and ISO 14044:2020 standards; it follows four phases: Goal and Scope Definition phase, Life Cycle Inventory (LCI), Life Cycle Impact Assessment (LCIA) and Life Cycle Interpretation. This study focuses on the implementation of SO-LCA in a wine-producing organisation starting from a social organisational approach to the working conditions previously evaluated with SA8000. The SO-LCA case study was performed on a consortium composed of nine cooperative wineries located in Chieti, Abruzzo, a region in Central Italy. The existing experience of the consortium with SA8000 provided information and data on the working conditions of the companies involved in the life cycle of the evaluated wine line. All the results were in compliance with our expectations. In the future, it would be desirable to integrate the evaluation based on SA8000 with other data, thus including further working-related social themes in the evaluation.

Keywords: social organisational life cycle assessment; agri-food; wine; SA8000

1. Introduction

Sustainable viticulture is defined as a “global strategy on the scale of grape production and processing systems, incorporating at the same time the economic sustainability of structures and territories, producing quality products, considering requirements of precision in sustainable viticulture, risks to the environment, product safety and consumer health and valuing heritage, historical, cultural, ecological and aesthetic aspects” [1]. The three dimensions of sustainability (i.e., social, environmental and economic) were included in the definition of sustainable viticulture [2]. Indeed, the meaning given by the International Organisation of Vine and Wine (OIV) confirms that the wine sector is more than an environmental issue (i.e., chemical exposure, and water and energy availability; organic, biodynamic or integrated production; carbon and water footprint [3]), also including a wide

range of immaterial topics, such as culture, history, heritage and reputation [4], which make wine a product of excellence [5]. Preserving the landscape and biodiversity is common practice for winemakers who want to maintain the productivity of their land for the present business and the future generations of winemakers [6,7]. From this point of view, different sustainable wine-growing programs have been developed through collaborative efforts driven by national institutions [7,8]. Italy is one of the most committed countries concerning sustainable viticulture, which counts roughly 15 developed programs (e.g., Tergeo, New Green Revolution, VIVA Sustainable Wine, Ita.ca/Gea.vite, SOStain, etc.). All programmes take into account the Triple Bottom Line [9], with each dimension having different levels of depth. Truly, until now, the social dimension has been less considered, although the agri-food sector is characterised and affected by several social and socio-economic issues concerning consumers (e.g., the access to healthy food), society (e.g., employment and livelihood) and agricultural workers (e.g., working conditions) ([10]).

As regards social sustainability, wine companies usually use international initiatives for reporting, such as Global Reporting Initiative (GRI) [11]; IIRC Integrated Reporting Framework [12]; Social Accountability 8000 (SA8000) [13]; AccountAbility 1000 (AA1000) [14]; or ISO 26000 [15]. These standards and guidelines provide principles and procedures for operating in terms of sustainability, as well as its communication to stakeholders. They are oriented towards promoting human rights, labour and fair operating practices with their suppliers and consumers.

Nevertheless, a systematic approach for assessing the social issues along the supply chain is still lacking. In fact, these initiatives, as well as the programmes applied in the wine sector, are mainly circumscribed within the boundaries of the company and, therefore, the agriculture and winery phases, thus not considering the entire supply chain [5,6]. Companies should seriously address these issues to improve their social sustainability along their supply chain.

The Life Cycle Thinking (LCT) methodologies allow the entire supply chain of wine [5,15,16] to be analysed via a systematic approach. Among them, Social Organisational Life Cycle Assessment (SO-LCA) was proposed to extend the product perspective of Social Life Cycle Assessment (S-LCA) to a more complex view of the organisation [16,17]. SO-LCA assesses the entire organisation or part of it (e.g., facilities, geographical area, brands) from a life cycle perspective. It is implemented through the technical framework adopted by Organisational LCA (O-LCA) and S-LCA and according to the ISO standards [18,19]; it follows four phases: Goal and Scope Definition phase, Life Cycle Inventory (LCI), Life Cycle Impact Assessment (LCIA) and Life Cycle Interpretation.

SO-LCA can be implemented “from zero experience” [16] (p. 1593) or by following three different Pathways (see Figure 1). Despite it, there are still few SO-LCA applications (e.g., [20–24]) and, according to the Authors’ best knowledge, no implementations have been built on an organisation’s previous experiences and existing organisational approaches following Pathway 1. Therefore, this work, which re-proposes, with some modifications a previous research study [25], investigates the main opportunities and limitations of SO-LCA implementation following Pathway 1 with the aim of understanding which approaches can be suitable for this purpose and to what extent.

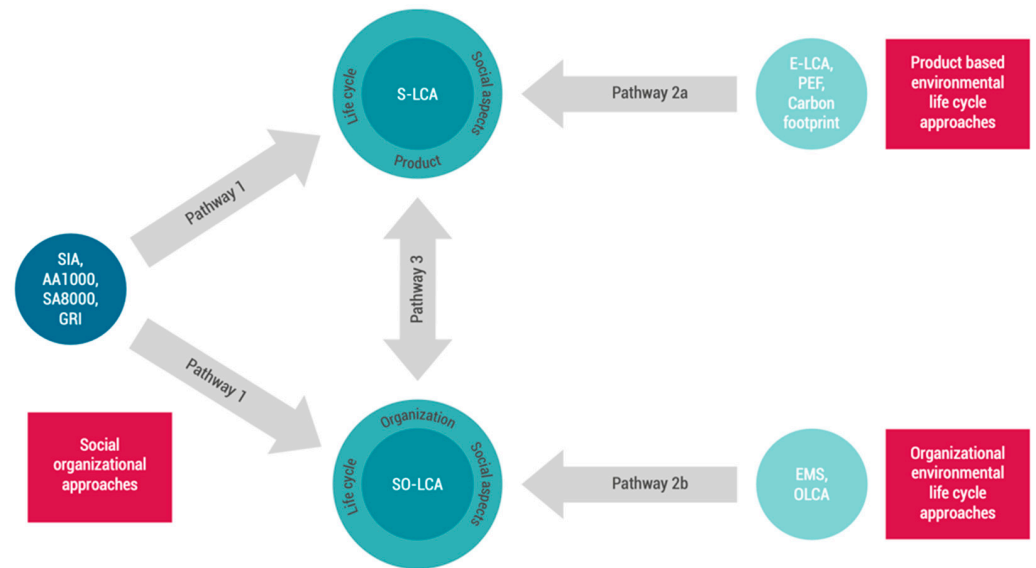


Figure 1. The three experience-based pathways for SOLCA. Source: [17].

2. Materials and Methods

2.1. SO-LCA

SO-LCA acknowledges the assessment of the social and socio-economic aspects and the positive and negative potential impacts of the activities related to an organisation as a whole or a portion thereof, from a life cycle perspective. The new Guidelines for Social Life Cycle Assessment of Products and Organisations 2020 [17] define SO-LCA as a complement of O-LCA, since the social dimension evaluation is combined with the organisational Life Cycle Thinking approach. Therefore, it shares several standard features with S-LCA (i.e., stakeholder category, subcategories, type of impact assessment) [17] and O-LCA [26].

SO-LCA implementation can be based on previous experience with different social and environmental assessment approaches, following three different Pathways (Figure 1), considering the organisation's previous experience [17]. Pathway 1 can be addressed if the organisation has experienced social, organisational approaches (such as Social Impacts Assessment (SIA); Global Reporting Initiative (GRI); AccountAbility 1000 (AA1000); SA8000); Pathway 2, if it has had experience with environmental life cycle approaches at the product (Pathway 2a) or organisational (Pathway 2b) levels; Pathway 3 is conducted if the organisation has had experience with product social life cycle approaches.

Pathway 1 can be followed when the evaluated organisation has already applied social assessment at the organizational level, by using the obtained information and results as starting point. Useful information could regard the structure of the organisation and its activities to be used for the definition of system boundary and suppliers [17]. In addition, the data gathered can be used for the inventory.

Experience with environmental life cycle approaches (both at product and organisational levels) could help the organisation to implement SO-LCA following Pathway 2 (Pathway 2a and 2b, respectively) supporting the goal and scope definition to be modified in relation to the considered social dimension [17].

Finally, experience with social life cycle approaches (both at product and organisational levels) could usefully support the organisation in the implementation of SO-LCA following Pathway 3 providing the required data, considering that most of the data and indicators adopted in an S-LCA study can also be applied in an SO-LCA one [17].

2.2. SO-LCA Case Study

A SO-LCA case study was implemented by considering a consortium composed of nine cooperative wineries located in Chieti, Abruzzo, a region in Central Italy. These nine cooperative wineries comprise 3000 members committed to the agriculture and harvest

processes and provide grapes for the nine cooperative wineries which produce wine for the consortium. The consortium is responsible for bottling (including the blending, cutting and fining processes) and selling.

Even though the consortium manages the bottling process, it indirectly controls every phase prior to the wine arrival. Indeed, the winery members are part of the consortium, and their territories are also managed by the agronomist of the consortium to verify the quality of the wine.

The consortium is certified in Quality and Environmental Management Systems (ISO 9001:2015, ISO 14001:2015) and Food Security Systems (ISO 22000:2018), BRC (British Retail Consortium) Standard, ISF (International Featured Standards) and SA8000. The presence of these organisational certifications allows us to implement SO-LCA following Pathway 1. In particular, the SA8000 certification was considered, since it covers working conditions that are affected by several criticalities in Italy (e.g., irregular work, labour exploitation, absence of health and safety conditions, forced labour, sexual harassment [27])

Therefore, in line with the main goal of the study, this SO-LCA application aims to address the following questions:

- How can the SA8000 certification support the-SO-LCA evaluation of working conditions?
- What SA8000 data on working conditions can be helpful, and how can they be used in SO-LCA?

Figure 2 shows the logic flow of the research questions.

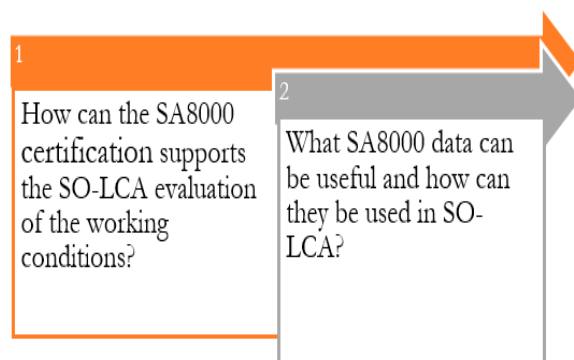


Figure 2. Logic flow of the research questions. Elaborated by the Authors.

The following sub-sections describe the phases of the case study according to UNEP [17].

2.2.1. Goal and Scope Definition Phase

This case study provides an evaluation of the social performance concerning the working conditions in the supply chain of a wine-producing consortium. The reporting organisation (i.e., the definition of the subject of the study) was a wine line composed of five types of wine (i.e., Montepulciano d’Abruzzo, Cococciola, Passerina, Cerasuolo and Pecorino). The consolidation method (i.e., the structure of the company and its relationship with other companies in terms of operational control, financial control, or the equity share [16]) was set in the absolute wine-producing consortium control. The reference period of the analysis was 2018. According to the goal of this case study, the system boundary was set “from gate to gate”. The assessment considered the foreground processes (i.e., specific/relevant processes of the designated reporting organisation), which include the sub-processes of blending, cutting, fermenting, clarification, fining, bottling and packaging, as well as background processes (i.e., secondary processes, not directly affecting the reporting organisation), which include cork, cardboard, glass bottle and wine processes. Other processes were not comprised for data availability reasons.

Therefore, twelve companies of the supply chain were considered: seven wine suppliers; one glass bottle supplier; two packaging companies; and one cork supplier. Figure 3 shows the flow chart of the wine-line life cycle and the defined system boundary.

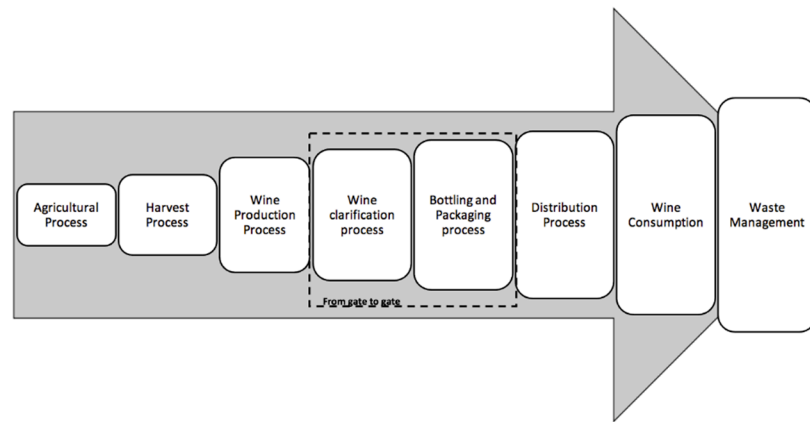


Figure 3. Flow chart of the wine-brand life cycle and the system boundary. Source [25].

The “Worker” stakeholder category was selected for the assessment according to the goal of the case study. Moreover, the considered subcategories (i.e., Health and Safety, Forced Labour, Child Labour, Fair Salary and Equal Opportunities/Discrimination) were those selected by D’Eusanio et al. [28], who implemented a participatory approach (i.e., Pugh Matrix) to identify the most relevant subcategories for the Italian wine sector by directly interviewing the involved stakeholders. Therefore, the social indicators used for each selected subcategory were defined according to the Methodological Sheets for S-LCA [29].

Figure 4 shows the methodological approach for SO-LCA implementation.

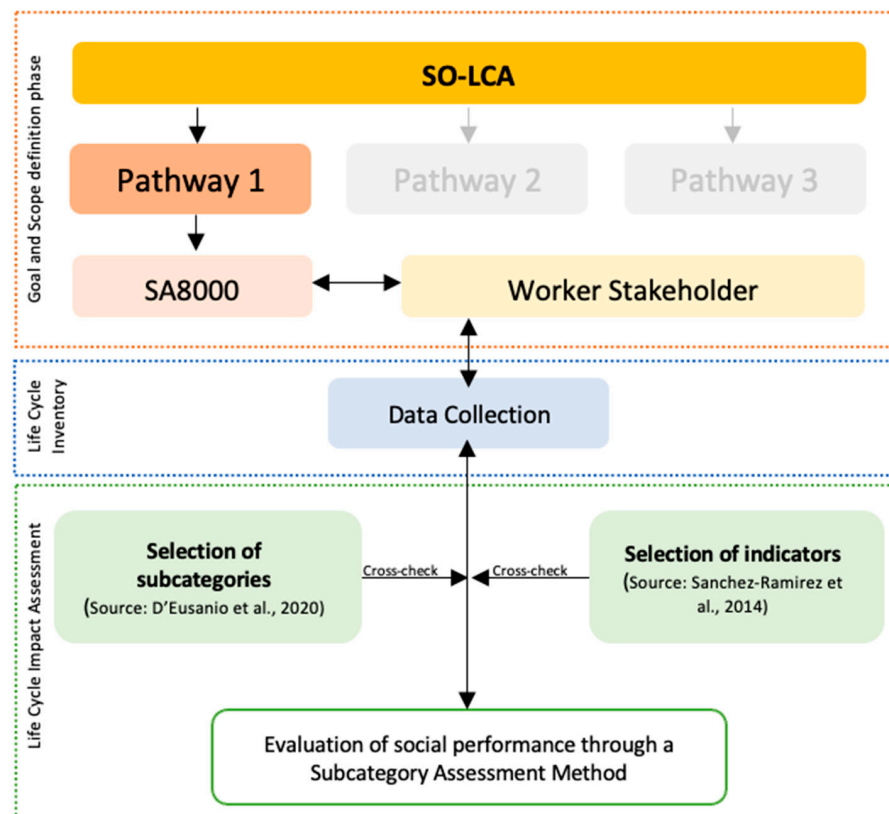


Figure 4. SO-LCA case study decision tree. Elaborated by the Authors.

2.2.2. Life Cycle Inventory

The Inventory phase included the collection of all data linked with the processes considered in the defined system boundary. Since SO-LCA was implemented by following Pathway 1, data collection was based on site-specific data gathered through the consultation of the questionnaires carried out by the suppliers in the context of the SA8000 by the consortium. A cross-check among the data collected via SA8000 questionnaire and the selected subcategories was performed. The subcategories finally evaluated were those with which the obtained data coincided. Table 1 shows the data collected for each assessed subcategory, the used social indicators and their unit of measurement (i.e., qualitative, quantitative or semi-quantitative).

Table 1. Indicators used for assessing the subcategories based on the data collected.

Subcategories	Basic Requirement [30]	Social Indicators	Data Collected via SA8000
Child Labour	Presence of a policy to avoid child labour, and there is no evidence of child labour.	Absence of working children under the legal age or 15 years old (14 years old for developing economies) Unit of measurement: Quantitative	Child under 15 years. Occasional employment of workers under 15 years.
Forced Labour	Presence of a policy to avoid forced labour or evidence of no forced labour.	Birth certificate, passport, identity card, work permit or other original documents belonging to the worker are not retained or kept for safety reasons by the organization neither upon hiring nor during employment. Unit of measurement: Quantitative	What kind of documents are held by workers before and during their work at the company?
Health and Safety	Presence of a policy and planning (and its actualisation) of education and training programs concerning health and safety.	Presence of a formal policy concerning health and safety. Unit of measurement: Qualitative/semi-quantitative Adequate general occupational safety measures are taken. Unit of measurement: Qualitative/semi-quantitative Preventive measures and emergency protocols exist regarding accidents and injuries. Unit of measurement: Qualitative/semi-quantitative Appropriate protective gear is required in all applicable situations. Unit of measurement: Qualitative/semi-quantitative Education, training, counselling, prevention and risk control programs in place to assist workforce members, their families or community members regarding serious diseases. Unit of measurement: Qualitative/semi-quantitative Preventive measures and emergency protocols exist regarding pesticide and chemical exposure. Unit of measurement: Qualitative/semi-quantitative	Presence of the risk assessment document. How often is the air conditioner revised? How often will the fire extinguishers be revised? Does the worker in the company have access to drinking water? Is drinking water available and usable? How often is water potability checked? Where are emergency and evacuation plans exposed? If present, how are the safety exits indicated? If present, are emergency exits normally locked for security reasons? What kind of preparation does the emergency attendant have? If the emergency attendant is present, what action does the intervention take? If safety training is provided, which people are provided with it? Did you need to appoint a Prevention and Protection Manager for your organisation? If you use the safety training, do you register the workers' names? What kind of training is planned for the newly hired? What kind of Personal Protective Equipment (PPE) is delivered to workers? If chemicals are present, what kind of PPE do you use?
Fair Salary	The lowest salary equal or higher than the minimum wage.	Lowest paid worker, compared to the minimum wage. Unit of measurement: Quantitative Regular and documented payment of workers (weekly, bi-weekly). Unit of measurement: Qualitative/semi-quantitative	What is the average net salary a worker receives? What average net salary does an employee receive? How are salaries paid?

2.2.3. Life Cycle Impact Assessment

Since the goal of the SO-LCA case study is to describe a wine line focusing on its social performance, the impact assessment method used was a Reference Scale Approach. The Subcategory Assessment Method (SAM) developed by Sanchez-Ramirez et al. [30] was chosen as a consolidated characterisation method of Type 1 to evaluate subcategories in the impact assessment phase [30] in order to limit the uncertainty due to the novelty of SO-LCA [23].

The SAM is based on a level and score scale (Table 2).

Table 2. Subcategory Assessment Method [30]

Subcategory Assessment Method (SAM)				
	Level A	Level B	Level C	Level D
Score	4	3	2	1

The assignment of each level is based on criteria defined for each one. This necessitates the identification of the Basic Requirement (BR) defining Level “B”, which is in compliance with international and national agreements. Therefore, Level “B” is given when the organisation fulfils the BR, while Level “A” is given for behaviour that goes beyond compliance. On the contrary, Level “C” is given to the organisation not complying with the BR but operating in a negative context in relation to social aspects. Finally, Level “D” is given to the organisation that does not satisfy the BR, but it is operated in a positive context [30].

3. Results and Discussion

3.1. Working Conditions

The obtained results were affected by the assumptions made in the previous sections.

For all companies involved in the considered processes, the Health and Safety subcategory was assessed as Level “B”. In fact, the data collected via SA8000 made it possible to acquire information regarding the presence or absence of emergency and evacuation plans, as well as the presence of indications on emergency exits (specifying that the latter were not locked but usable at all times). Furthermore, the companies stated that they provided their workers with common PPE (i.e., gloves, safety shoes, masks, headphones, glasses) and specific PPE (i.e., masks with a respirator, gloves, protective clothing) suitable for chemical substances. In addition, companies declared that a security officer was present and took part in training and/or safety update courses.

SA8000 questionnaires emphasise the possibility to access drinking water as well as controlling fire extinguishers and air conditioners that can affect the health of workers. Given that the BR (Table 2) of Health and Safety is the presence of programmes or policy and the presence of education and training related to health and safety, Level “B” was assigned.

The Child Labour subcategory was evaluated as Level “B”, because no minors were present at the workplace in none of the involved companies.

With regard to the Fair Salary subcategory, the data showed that the average wages, of both employees and workmen, were in compliance with National Collective Labour Contracts (CCNLs). Moreover, it was possible to observe the payment method, i.e., salary was paid by bank transfer and bank checks. For these reasons, all companies were assigned Level “B”.

The Forced Labour subcategory was assessed as Level “B” for all companies, since they were not in possession of workers’ original documents neither before nor during their employment. For some companies (i.e., C4, C6, C8, C11, C12), it was not possible to evaluate the Forced Labour subcategory due to lack of pertinent data.

Figure 5 shows the social performance of the wine-producing consortium located in Abruzzo, Italy.

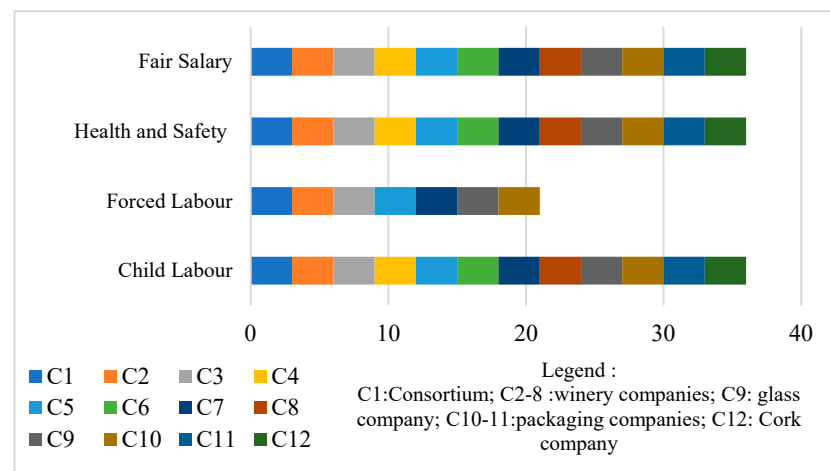


Figure 5. SO-LCA of a wine-producing consortium in Abruzzo, Italy. Source [25].

3.2. Implications and Limitations Related to the Use of SA8000

SA 8000 is an international certification standard that supports organisations in their management system to improve social sustainability by addressing social issues such as forced and child labour, health and safety, freedom of association, discrimination, working hours and wage. It can be implemented within any organisation without limits of size and location [31].

In this case, SA8000 proved to be a starting point for data collection regarding workers' conditions. However, the data collected for SA8000 were often not sufficient to build a complete frame for the social subcategories selected following the approach developed in a previous case study [28]. Indeed, it was not possible to assess the Equal Opportunities/Discrimination subcategory by using the SAM, as the SA8000 questionnaires used did not supply data for the provided Basic Requirement (i.e., presence of management system, policy or actions to prevent discrimination and increase in equal opportunities). However, some useful data for the evaluation of the subcategory are present (e.g., number of men and women employed).

The assessment was limited to the selected subcategories. However, by extending the analysis to the other ones, data can be obtained from the SA8000 certification questionnaires for the SAM Basic Requirement provided for assessing the subcategory Social Benefits/Social Security (e.g., presence of more than two benefits among social security benefits, retirement, disability, parental leave, paid sick leave, etc.) and the subcategory Freedom of Association (i.e., evidence of workers belonging to a workers' union). On the contrary, there were no data to assess the Basic Requirement provided by Sanchez Ramirez et al. [30] for the Working Hours subcategory (i.e., Average weekly hours worked not exceeding 48 h), although useful information (e.g., rest day, overtime hours) was present.

Finally, there were no data for the newly introduced subcategories Employment Relationship and Sexual Harassment.

Moreover, it was not possible to evaluate the level of assessment "A" (i.e., proactive performance), since the questions of the SA8000 do not cover the criteria required to evaluate this aspect. Given that SA8000 certifies the respect of human rights, labour law and protection against child exploitation and guarantees safety and health in the workplace, the assessment can only assign Level B (compliance).

Therefore, it would be desirable to integrate the evaluation based on SA8000 with other data, thus including further working-related social themes in the evaluation.

In this frame, the company has a preliminary knowledge of the aspects and topics to be analysed, and consequently, time and resource saving should be expected to be applied to assess its social performance.

4. Conclusions

The SO-LCA methodology allows a comprehensive social performance assessment of an organisation to be conducted by involving different departments and management levels. Thus, the involvement of different resources may lead to long term benefits in the data-collection phase. The assessment of social performance offers a picture of the current social sustainability of the company and can be used in the decision-making process, also within the support of non-financial reporting initiatives.

Moreover, SO-LCA supports informed decisions on the potential social impacts of the analysed processes, which lead to an opportunity for improvement.

This study attempted to implement SO-LCA starting from a previous experience of the company with a social organisational approach (SA8000) following Pathway 1. An SO-LCA case study of a wine consortium located in the Abruzzo region (Italy) was performed, using the data previously collected for the SA8000 certification.

The existing experience of the consortium with SA8000 provided information and data on the working conditions of the companies involved in the life cycle of the evaluated wine line. All the results are in compliance with our expectations, but the case study was more about understanding which aspects of the SA8000 data allow us to assess and understand which information to integrate. From this perspective, future developments would concern the analysis of which data can be taken from other certifications and standards to be used to assess the social performance of organisations.

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