

Toward a Sustainability Balanced Scorecard for Managing Corporate Social Responsibility: A Conceptual Model



Gabriela Sucozhañay, Fanny Cabrera, Dolores Sucozhañay, Rodrigo Guaman, Lorena Siguenza-Guzman, and Paul Vanegas

Abstract The Sustainability Balanced Scorecard (SBSC) allows companies to track organizational operations and measure their impact on company objectives. To monitor the impact of Corporate Social Responsibility (CSR) activities and ensure its alignment with the company's strategy, CSR elements need to be integrated into the organization's dashboards. The main goals of this study are threefold: (1) identify the

G. Sucozhañay (✉) · F. Cabrera · D. Sucozhañay · P. Vanegas
Department of Space and Population, University of Cuenca, Avenue 12 de Abril,
010203 Cuenca, Ecuador
e-mail: carolina.suczhanay@ucuenca.edu.ec

F. Cabrera
e-mail: fanny.cabrerabl6@ucuenca.edu.ec

D. Sucozhañay
e-mail: dolores.sucozhanay@ucuenca.edu.ec

P. Vanegas
e-mail: paul.vanegas@ucuenca.edu.ec

R. Guaman
Department of Applied Chemistry and Systems of Production, Faculty of Chemical Sciences,
University of Cuenca, Avenue 12 de Abril, 010203 Cuenca, Ecuador
e-mail: rodrigo.guaman@ucuenca.edu.ec

L. Siguenza-Guzman
Department of Computer Sciences, Faculty of Engineering, University of Cuenca,
Avenue 12 de Abril, 010203 Cuenca, Ecuador
e-mail: lorena.siguenza@ucuenca.edu.ec

P. Vanegas
Faculty of Chemical Sciences, University of Cuenca, Avenue 12 de Abril, 010203 Cuenca,
Ecuador

D. Sucozhañay
Faculty of Economics and Administrative Sciences, University of Cuenca, Avenue 12 de Abril,
010203 Cuenca, Ecuador

L. Siguenza-Guzman
Research Centre Accountancy, Faculty of Economics and Business, KU Leuven,
Naamsestraat 69, B-3000 Leuven, Belgium

main CSR elements and the proposal of an analysis scheme for CSR's strategies; (2) assess local and regional CSR implementations using the previously identified elements, and (3) incorporate the identified CSR metrics into a management dashboard based on the findings of the previous steps. Both a systematic literature review and in-depth analysis of case studies were used in this study. The results show that four elements: principles, dimensions, stakeholders, and means can be applied to analyze CSR strategies consistently. In addition, a structure for a management dashboard that incorporates subcategories and indicators for the assessment of sustainable CSR strategies aligned with the company goals is proposed.

Keywords CSR · CSR elements · Sustainability balanced scorecard · CSR management dashboard

1 Introduction

Corporate Social Responsibility (CSR) was conceived as a response to emerging social concerns regarding organizational behavior. From its origins, this concept has gradually evolved to address different economic, social, political, and environmental contexts, which has led to the absence of a single definition.

Initially, CSR definitions focused mainly on social issues [44]. Subsequently, in the 1970s, the evolution of the CSR concept was influenced by different types of events, such as population growth, pollution, resource depletion, and social movements related to human and labor rights, and environmental responsibility [27]. At about the same time, the concept of “sustainability” appeared, emerging from ecological movements with an emphasis on environmental issues and has evolved to include three dimensions: economic, social, and environmental.

In 1994, John Elkington steered CSR approaches toward economic prosperity, environmental quality, and social equity, linking business and CSR with the triple bottom line of sustainability [5, 25]. Since then, many companies have included sustainable aspects of CSR practices [24, 28]. However, the main barriers for CSR implementation and reporting remain to be the lack of agreement on its definition and its core underpinning [37].

A large number of sustainability assessment (SA) initiatives and methodologies have been developed to cope with the complexity of the implementation of the sustainability paradigm [32, 36]. In this sense, the Society for Environmental Toxicology and Chemistry (SETAC) and the United Nations Environment Program (UNEP) created the Life Cycle Initiative (LCI) [26] to promote “life cycle thinking” (LCT) in the mindset of decision-makers.

Thus, LCI contributes to the achievement of the Sustainable Development Goals (SDG). LCT is defined as a holistic approach that considers sustainability factors throughout the entire life of a product or process, from conception to use and disposal [13, 14, 31, 36, 46]. Its primary goals are to reduce environmental impacts, improve

the socioeconomic performance throughout the life cycle of a service/product, and avoid transferring harmful effects to other phases in its life cycle [29].

A series of life-cycle-based methodologies have been developed to achieve the LCT objectives, such as Life Cycle Costing (LCC), Social Life Cycle Assessment (SLCA), and Environmental Life Cycle Assessment (E-LCA). These methodologies were designed to support decision-making at all levels of the value chain, offering the possibility to examine a wide range of key impact categories and indicators. Life cycle-based methodologies are recognized worldwide as one of the best ways to assess sustainability. LCT helps companies to look beyond their economic interest, to transfer environmental awareness along supply chains, to create incentives for environmental, economic, and social improvements, and consequently play a significant role in CSR implementations [40].

Management dashboards are essential to companies to promote, measure, and profit from implementing sustainable development strategies. They allow decision-makers to link business information to business objectives, thus supporting the design and implementation of business strategies [6]. One of the most popular management dashboards is the Balanced Scorecard (BSC) [12]. BSC is divided into four main dimensions: finance, customers, internal processes, and organizational learning [33]. These dimensions allow controlling the effects of actions, improving the vision of the company's performance, and anticipating its future performance [7].

When BSC incorporates economic, social, and environmental aspects in implementing business strategies, it is called Sustainability Balanced Scorecard (SBSC). This integration can be achieved either by adding CSR metrics in each BSC dimension restructuring the existing strategy maps and indicators or creating a specific fifth CSR dimension [30].

Although many studies related to CSR can be found in the literature, its implementation continues to be a challenge for companies that are overwhelmed by the lack of agreement on the CSR elements that should be considered to embrace sustainable practices. Furthermore, to monitor the impact of CSR activities and ensure alignment with the business strategy, CSR metrics need to be designed and integrated into the organizations' dashboards, allowing companies to monitor their activities and impacts.

The aim of this study is threefold. Firstly, to identify the main CSR elements to organize and understand their fundamental basis under the lenses of the sustainability paradigm. Secondly, to use the specified components to analyze CSR implementations through five case studies in Ecuador and Latin America. Lastly, to propose the structure and indicators of a management dashboard that includes the sustainable CSR elements identified.

The remainder of the article is structured as follows. Section 2 describes the applied methodology divided into three stages: the CSR literature review, the analysis of local and regional CSR implementations, and the incorporation of sustainable CSR elements into a management dashboard. Section 3 describes the results obtained, organized in the same three stages presented in the methodology. Finally, Sect. 4 presents the discussion and conclusions drawn from the study and opportunities for further research.

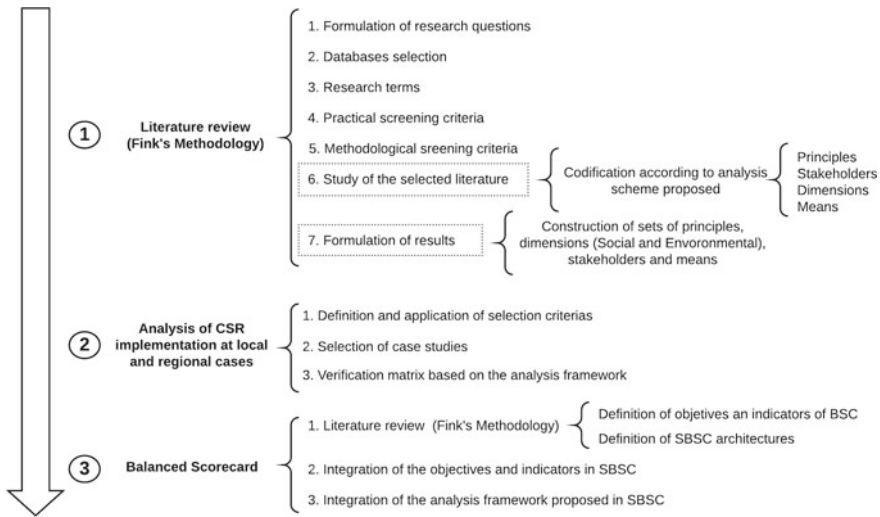


Fig. 1 Methodological scheme for the study

2 Methodology

This study was developed in three stages, as shown in Fig. 1. First, a systematic literature review on the CSR concept was carried out, and an analysis scheme was proposed. Second, local and regional CSR implementations were analyzed with the proposed scheme. Finally, based on this scheme, a structure of a management dashboard incorporating sustainable CSR elements is developed.

2.1 CSR Literature Review

A systematic literature review was developed based on Fink’s methodology to explore the CSR concept. This methodology considers seven steps: (1) Formulation of the research questions; (2) Selection of source databases; (3) Selection of research terms; (4) Application of practical screening criteria; (5) Use of methodological selection criteria; (6) Review of documents; and, (7) Summary of the results. For the initial step, the approach and scope of the investigation were established.

The following research questions were formulated: (1) What are the elements of the CSR concept? (2) What methodologies or tools are used to implement CSR in companies? (3) How are the impacts of CSR strategies evaluated? And, (4) How is sustainability considered in CSR strategies? The second step corresponds to the database selection. This study was focused on digital resources in the following databases: ProQuest, Science Direct, SciELO, Springer Link, and Google Scholar. As a third step, research terms were determined: “CSR definition”, “CSR elements”,

“CSR evolution”, and “CSR context”. The fourth step was applying the practical screening criteria as a publishing period from 2009 to 2020, and the language as only the articles published in Spanish and English.

The fifth step was the application of the methodological screening criteria. This step required using a “Findings Matrix”, which contains information such as the publication year, author’s name, document title, content information, and the abstract. These elements were used to perform a content analysis to determine if the articles contain relevant information for the research. After applying the practical and methodological screening criteria, an initial sample containing 47 articles was established (Appendix A). Moreover, life-cycle-based methodologies’ guidelines documents and a CSR guideline were also included to incorporate the sustainable approach (e.g., Life Cycle Assessment—LCA, Organizational LCA—OLCA, Social LCA—SLCA, Social Organizational LCA—SOLCA, Ethos). The final sample of 47 articles and 5 guidelines for the literature analysis was determined.

The sixth step corresponded to the study of the selected literature. Each article was read, and its elements were identified and coded using an analysis scheme. This scheme was divided into four codes, i.e., Principles, Dimensions, Stakeholders, and Means, which were defined based on the results of the findings matrix of the previous stage. The Principles refer to the fundamental basis for decision-making or for determining behavior [22]. The Dimensions correspond to complex variables that can be individually analyzed using elements that indicate their response, i.e., through indicators [4]. Stakeholders refer to individuals or groups interested in any decision or activity of the organization [22]. Finally, the Means correspond to the method or manner of doing something [15].

Finally, the last step formulates the results. For this, quotes within each code were analyzed. Thus, a set of principles and stakeholders for the analytical scheme was obtained. Special treatment was given to the “Dimensions” code because this element included subcategories and indicators. In this context, the three sustainability dimensions, Economic, Social, and Environmental, were first considered a reference because they have a broader approach and provide methodologies for evaluation. However, after discussions with the research team, the Economic dimension was not considered. This decision was made because CSR practices are mostly related to financial performance, which does not require CSR practices for its development. Likewise, many economic aspects are included in the Social dimension. The analysis of the Economic dimension in CSR is open to further debate in future research. The study was performed with particular emphasis on strategies described in the Ethos guidelines to identify Means, Ethos is a widely used management tool that supports sustainability and CSR implementations [11].

This tool is structured in five organizational levels: 4 dimensions (strategic vision, governance, and management, social and environmental); 8 topics; 18 subtopics; 48 indicators, and 741 sub-indicators. Due to a large number of specific Means found, they were classified into macro activities to facilitate the presentation of results.

The LCA and OLCA guidelines were coded to identify subcategories and indicators of the environmental dimension. The results were then contrasted with impact categories and quantitative indicators subcategories of Ethos using a comparative

matrix. Thus, a set of environmental subcategories and indicators was obtained. LCA is a methodology that assesses environmental performance throughout the life cycle of a product or service considering its potential contribution to the categories of environmental impact, such as climate change, human and eco-toxicity, ionizing radiation, and resource depletion [39].

The benefits of this approach can be expanded to the organizational assessment. OLCA evaluates the inputs, outputs, and potential environmental impacts of an organization [42]. A broadly used environmental assessment method within LCA is ReCiPe, a method that transforms the long list of life cycle inventory results into a limited number of indicators. These indicators show the relative severity of an environmental impact category [34]. It determines indicators at two levels: 18 midpoint indicators that focus on individual environmental impacts, such as climate change or acidification, and 3 endpoint indicators that show environmental effects at three higher levels of aggregation: human health, biodiversity, and resource scarcity [20].

Ethos, SLCA, and SOLCA guidelines were used to identify the subcategories and indicators of social dimensions. SLCA is defined as a methodology to assess the positive and negative social and socioeconomic impacts of products and services throughout its life cycle, focusing on people [40]. SLCA has links to the SDGs and is considered the best tool in social sustainability. SLCA assesses the social impact by classifying stakeholder groups as workers, consumers, local communities, children, society, and value chain actors [41]. These stakeholders are linked to 36 subcategories, which are measured by 205 social indicators. SOLCA has been recently developed as a complement to SLCA with a perspective beyond the product, i.e., the organization as a whole [43].

This methodology assesses the social performance of the organization, considering a life cycle perspective. While SOLCA is organized based on the subcategories, indicators, and stakeholders used in SLCA, Ethos is organized into dimensions, sub-dimensions, indicators, and sub-indicators. The strategic vision, governance, and social dimensions of Ethos (37 indicators) and SLCA (36 subcategories) were selected as inputs for the social dimension. Three types of relationships were identified between the SOLCA subcategories and the Ethos indicators. That is fully matched, partially matched, and entirely new subcategories. A set of subcategories was obtained to consider these relationships and to measure the social CSR dimension.

2.2 Analysis of CSR Implementations of Local and Regional Cases

The second stage of the study consisted of analyzing CSR implementations in local and regional case studies. To do this, five case studies were selected, three local (Ecuador) and two regional (Latin America), considering service and production enterprises. The selection criterion for the local case studies was the position (best,

Table 1 Local and regional CSR reports analyzed

Country	Local cases			Regional cases	
	Ecuador			Chile	Mexico
Company	Pronaca	Adelca	CNT	BCI	Grupo Bimbo
Product/Service	Food	Steel	Telecommunications	Financial	Food
Year of creation	1979	1963	2008	1937	1945
Number of employees	7905	1573	8941	11209	133824
Year of report	2018	2017	2017	2019	2019

average, and worst) held by Ecuadorian enterprises in the “Ranking of Corporate Reputation in 2019” [30].

For regional cases, the position (best and worst) occupied by the Latin American countries in the “Sustainability Goal Development Index and dashboard 2019 report” was used. Then, from these countries, an enterprise was selected according to its “Ranking of Corporate Reputation in 2019”. For local cases, the enterprises Pronaca (ranking two), Adelca (ranking 51), and the National Telecommunications Corporation-CNT EP (ranking 83) were selected. For regional cases, Chile and Mexico were selected as the best- and worst-performing countries. Consequently, the companies Chile’s Credit and Investment Bank (BCI) and Grupo Bimbo from Mexico were chosen. Table 1 shows general information on comparative analysis [2, 9, 16, 18, 35]. Then a verification matrix was built from the sustainability reports of the case studies and the analysis scheme established in the first phase.

2.3 *Balanced Scorecard*

Finally, the third stage of this study consisted of integrating the elements identified in the analysis scheme in a management dashboard. To this end, the following steps were performed. Firstly, a literature review similar to that described in Sect. 2.1 on BSC and SBSC was conducted, focusing on their architectures, generic objectives, and indicator categories. Four research questions were formulated: (1) What are the general objectives of a BSC? (2) What are the metrics used in a BSC? (3) What are the architectures behind an SBSC? (4) How can a CSR perspective be integrated into a BSC? To answer these questions, the following databases, Science Direct, Springer Link, and Google Scholar, were used. Likewise, the subsequent search terms were utilized: “SBSC architecture”, “BSC indicators”, and “BSC objectives”. Additionally, the same practical and methodological screening criteria described in Sect. 2.1 were used to obtain a final sample of 12 articles (Appendix B).

Each selected article was reviewed and analyzed. Two summary matrices were developed. The first matrix contains the main SBSC architectures and their characteristics, while the second matrix includes generic BSC objectives and indicators.

Secondly, elements for the social and environmental evaluation of CSR were incorporated into the generic goals and indicators categories found in the literature of four traditional BSC perspectives, i.e., Financial, Customer, Internal Process, and Learning and growth. For the perspectives of Social and Environmental sustainability, the subcategories of indicators were taken from the element called “Dimensions” identified in the proposed analysis scheme. Their generic objectives were presented according to these indicators. Finally, based on the definitions and characteristics of the other CSR elements identified, and the discussions with the research team, the principles, means, and stakeholders were also incorporated into the proposed SBSC structure. It is essential to mention that the interactions among indicators, objectives, and perspectives were not yet considered in the SBSC.

3 Results

The results are presented in three parts. First, the outcomes of the literature review and the proposed analysis scheme are presented. Secondly, five case studies of CSR implementations in Ecuador and Latin America are analyzed. Finally, based on the findings in the literature review, the CSR elements are incorporated into an SBSC structure.

3.1 *CSR Literature Review*

The resulting literature review of CSR showed that although a large number of studies focused on CSR were found, most of them offer different conclusions about its definitions and core underpinning. However, it is possible to identify a group of four elements with similar characteristics. The identified factors are Principles, Dimensions, Stakeholders, and Means, which can be employed to analyze CSR implementations. In addition, it was found that the Means are the link between Principles, Dimensions, and Stakeholders. They describe the actions that enterprises take to achieve CSR goals. Many enterprises implement CSR strategies by using tools such as Ethos or the Global Reporting Initiative (GRI), which provide metrics for evaluating CSR strategies and incorporate some aspects considered in the sustainability assessment. Finally, an analysis scheme was proposed to organize and analyze the CSR information found. In this context, 18 principles, 11 stakeholders, and 18 subcategories of the social dimension were identified. Regarding the environmental dimension, 7 subcategories and 24 means were identified for the analysis scheme. Figure 2 presents the CSR elements organized into three groups: principles, stakeholders, and dimensions (subcategories and indicators). In turn, each element is divided into three categories: only present in CSR, only present in Sustainability approaches, and present in both. Figure 3 presents the macro activities identified as commonly carried out for CSR implementations.

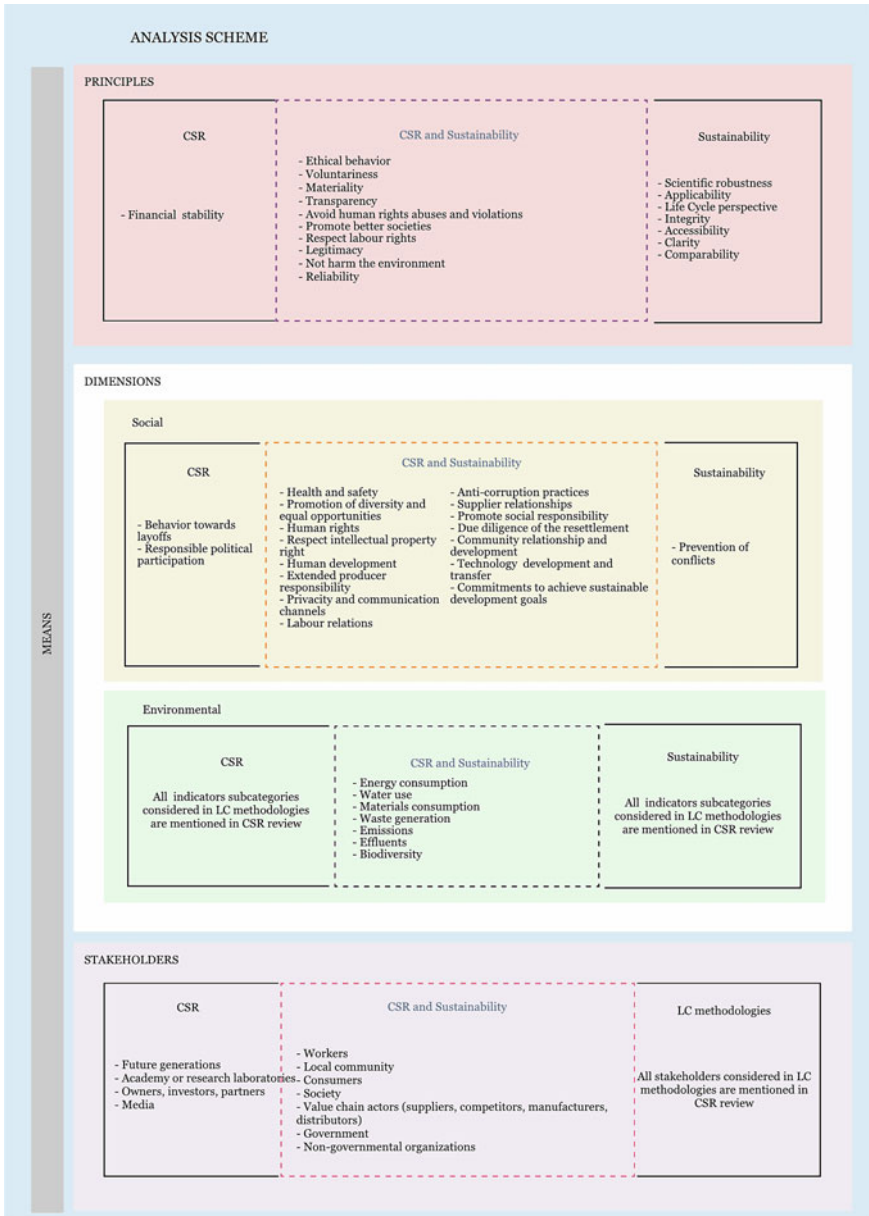


Fig. 2 The resulting CSR analysis schema



Fig. 3 Commonly suggested means

3.2 Analysis of CSR Implementations of Local and Regional Cases

The review of the local and regional case studies showed that most of the elements of the analysis scheme were identified in the CSR implementations. Additionally, the principles, stakeholders, and social and environmental subcategories and indicators can be classified into two levels, explicit and implicit. “Explicit” when they were easily identifiable in the reports and considered priority in the actions of the company. “Implicit” when they were found only in some specific practices described in the reports. Figure 4 shows the principles identified in the case studies, distinguishing both implicit and explicit. Findings indicate that 15 out of the 18 principles identified in the analysis schema were mentioned at least once in the business reports, and companies consider, on average, five principles. In addition, the principles of Legitimacy, Scientific robustness, and Applicability were not identified in the case studies.

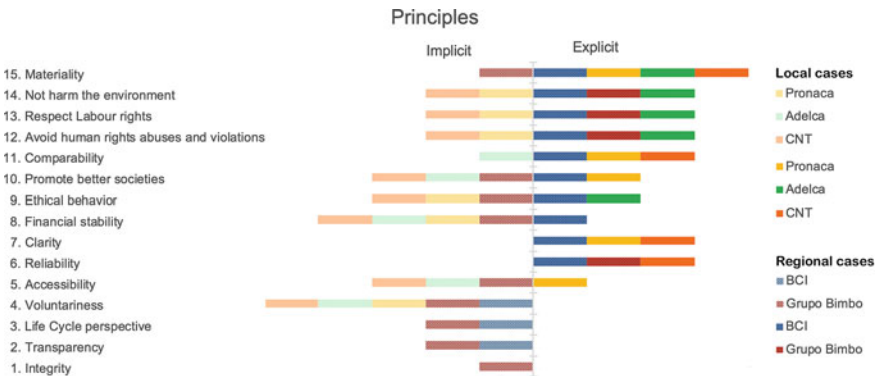


Fig. 4 Principles identified in the case studies

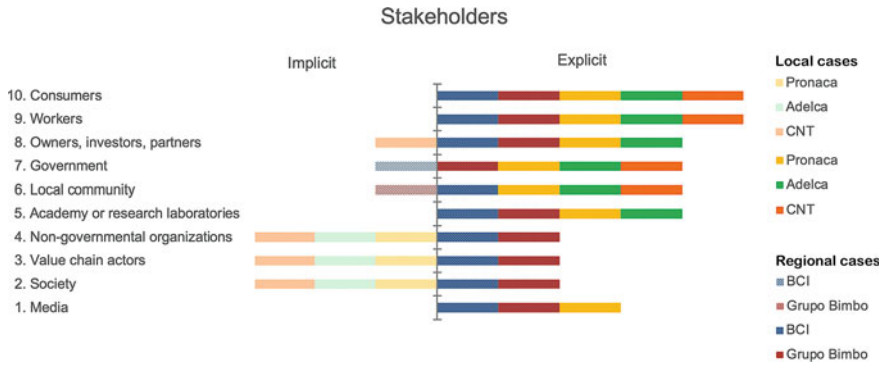


Fig. 5 Stakeholders identified in the case studies

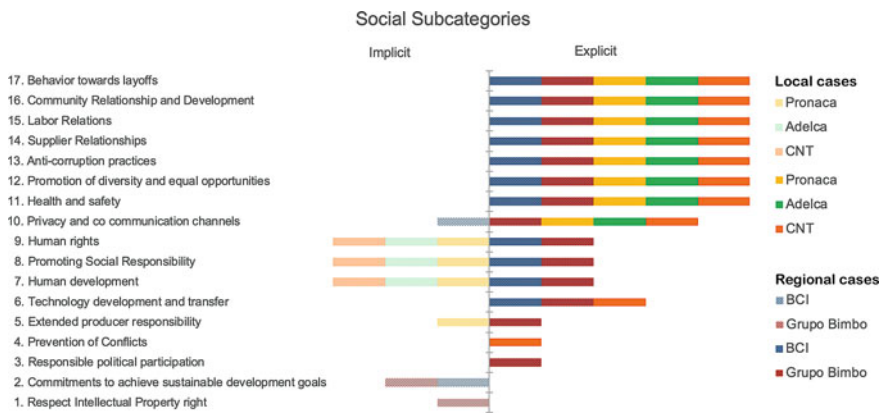


Fig. 6 Social subcategories identified in the case studies

Figure 5 shows the stakeholders identified in the case studies. Results indicate that 10 out of the 11 stakeholders proposed in the analysis scheme were found in the case studies. Consumers and Workers were identified as explicit in all enterprises; while, Future generation was not detected in any case. Other stakeholders, such as local community, government, owners, investors, and partners, were explicitly identified in four enterprises, and implicitly in one. Important to notice is that stakeholders Society, Value chain actors, and Non-governmental organizations were explicitly identified in regional enterprises, i.e., BCI and Grupo Bimbo. On the contrary, they were implicitly in local enterprises (i.e., Pronaca, Adelca, and CNT). Finally, stakeholders academy or research laboratories, and media were explicitly identified in four enterprises.

For the social dimension, 17 out of the 18 subcategories were found in the business reports, as shown in Fig. 6. Health and safety, Promotion of diversity and equal opportunities, Anti-corruption practices, Supplier relationships, Labor relations, Community relationships and development, and Behavior toward layoffs were identified

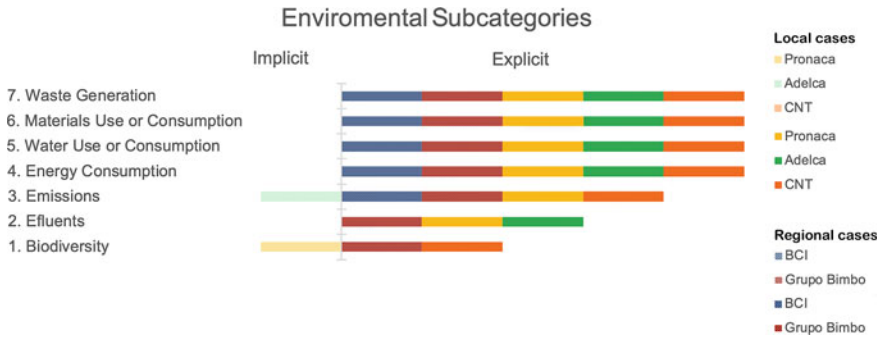


Fig. 7 Environmental subcategories identified in the case studies

as the most common social subcategories explicitly measured. Less common subcategories include Respecting intellectual property rights, Commitments to achieve SDGs, Responsible political participation, Conflict prevention, and Extended Producer Responsibility. Interestingly, Human development, Promoting social responsibility, and Human rights were explicitly identified in regional enterprises and implicitly in locals. Technological development and transfer and Privacy and communication channels were identified as explicit in three and four enterprises, respectively. The subcategory Due diligence of the resettlement was not detected in any enterprise analyzed.

Finally, for the environmental dimension, all seven subcategories proposed in the analysis scheme were identified in the five case studies, as shown in Fig. 7. The consumption of Energy, Water, and Materials, and Waste generation were determined as explicit environmental subcategories in all enterprises. Emissions, Effluents, and Biodiversity were explicitly identified in four, three, and two enterprises, respectively. Furthermore, Emissions and Biodiversity were also identified as implicit in Adelca, and Pronaca, respectively.

3.3 Sustainable Balanced Scorecard

In the BSC and SBSC literature review, 12 general architectures were identified, describing different manners on how the social and environmental perspectives can be integrated. Nevertheless, the “A0 architecture” was considered as the most suitable option to incorporate the identified elements of CSR in an SBSC. The reasoning behind this is that the A0 architecture maintains the traditional BSC perspectives and includes two independent sustainability perspectives, social and environmental. This allows maintaining its objectives and indicators, letting interactions with different new perspectives to be omitted in the first instance. Therefore, it was decided to use the A0 architecture, since this study did not analyze the formulation of strategies and interactions between the different BSC perspectives. Within the analysis, 45

Table 2 Generic objectives and indicator's categories of traditional BSC

Financial perspective	Customer perspective	Process perspective	Learning and growth perspective
Generic objectives			
Improve profits Reduce operational cost Gain financial budget Environmental cost savings Costs related to social impact Labor cost savings Increased revenue	Increasing the market share Improve customers' loyalty Improve the quality of services offered Link enterprise to Sustainability Expand the market niche Improve the customer's perception of product Customer attraction and retention Improve response time Provide new products Achieve customer satisfaction Improve the image of the enterprise Improve client management	Improve the quality of services and products Reduce the time of a process Develop new products Increase investment in new products Modernize the administrative structure Improve safer warehousing and transportation Provide an efficient process Improve human resources management Increase productivity Improve delivery system Improve product design process Promote continuous improvement Develop the support system	Improve the skills of employees Improve security Improve infrastructure Ensure employees well-being Efficient resource planning Obtained certifications Develop the support system Improve employees' retention Improve employee productivity Strengthen IT Culture Improve competencies Improve worker motivation Improve teamwork
Generic indicators categories			
Revenue grows Productivity grows Asset utilization Return on Investment Annual cash flow increase Sales growth Payback period Cost of fines Energy costs Operating expenditures Cost of employee benefits Costs legal actions Total tax paid Total sales	Market share Customer acquisition Customer retention Customer satisfaction Customer profitability Percentage of sales to new customers Customer referrals New product offers to customers Product attributes Customer relationship Average annual number of customer complaints Customer involvement in decision making	Innovation process Operations process Post Sale service process Cost indicators Quality indicators Time indicators Time to process the customer order Annual number of stock-outs for an order Percentage of all deliveries Time of launch new products to market	Employee retention Employee productivity Employee satisfaction Employee potentials Technical infrastructure Climate for action Employee turnover Research & development Employee knowledge sharing Labor force skills Effectiveness of training

generic objectives and 38 categories of generic indicators of the traditional BSC were identified and reported in Table 2.

The literature indicates that the Financial perspective focuses on improving profits. The Customer’s perspective is focused on achieving customer satisfaction, improving

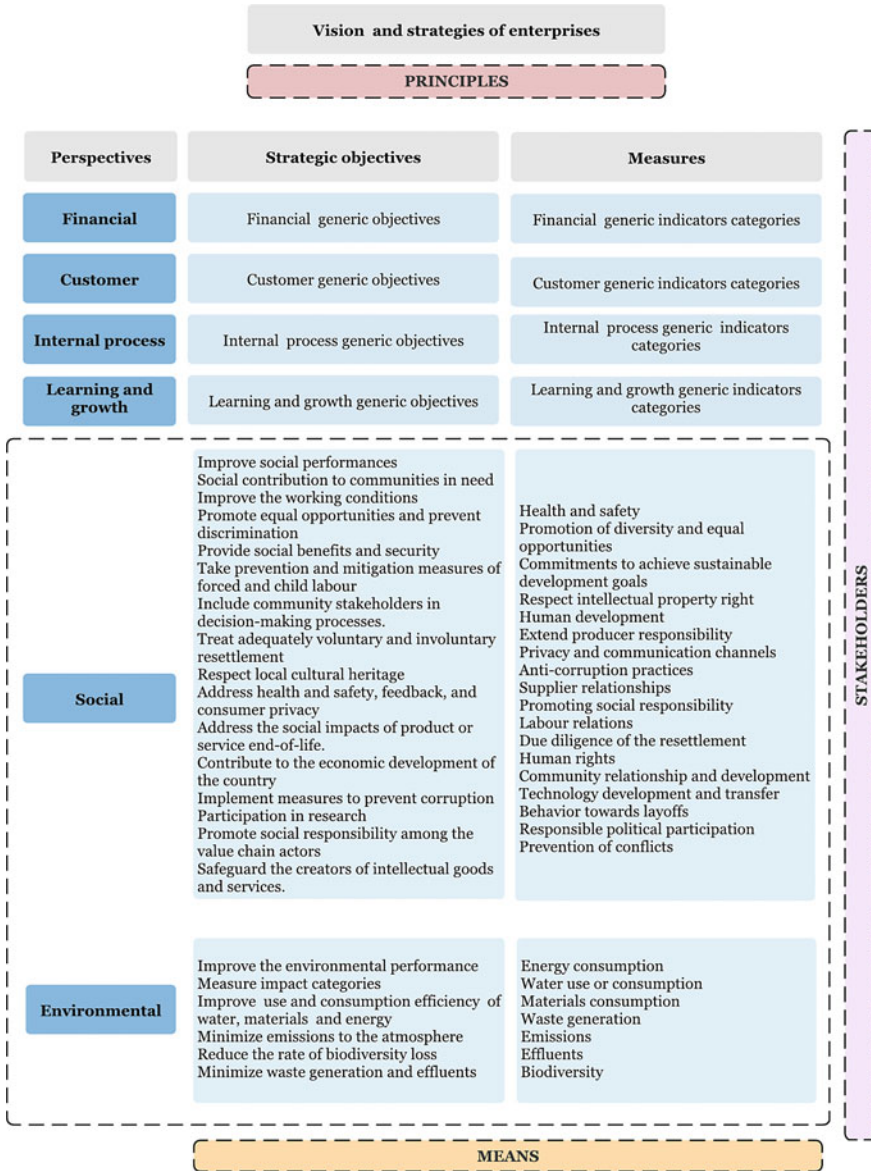


Fig. 8 Proposed SBSC framework

the quality of the services offered, and increasing market share. The Internal process perspective focuses on providing efficient processes.

And the Learning and growth perspective focuses on improving workers' knowledge, skills, and competencies. For the social and environmental aspects, 16 and 6 objectives were proposed, respectively, according to the subcategories and indicators identified in the CSR elements. In general terms, the Social perspective focuses on the well-being of stakeholders, and the Environmental perspective on improving business environmental performance. Principles were incorporated as a baseline of the enterprise vision and strategies since they are considered as the fundamental basis for decision-making.

Stakeholders were included across the six SBSC perspectives because they are deemed to be interested in any decision or activity of the organization. Eventually, the Means were incorporated at the end of the SBSC structure as it is considered a manner to operationalize and achieve business objectives. The resulting SBSC framework is illustrated in Fig. 8.

4 Discussion and Conclusions

The literature review on CSR showed no clear definition of CSR and its core underpinning [17]. However, the CSR elements identified in the proposed analysis scheme significantly facilitated the analysis of CSR approaches. In this sense, the analysis scheme corresponds to a first proposal to support CSR understanding and homogenization that needs to be further developed in future studies. Further investigation should be performed to create an analysis framework that facilitates the evaluation of CSR practices and strategies through the lenses of sustainability. The literature reviewed also showed that more and more businesses use sustainability dimensions to develop and report CSR practices [1]. Sustainable dimensions, i.e., Social, Environmental, and Economic, establish links between resources and the impacts associated with the use of these resources by particular sectors or production locations along the supply chain to the final consumer [45].

However, the role of the economic dimension is not exact in the CSR approach, as it is mainly related to financial indicators. The economic dimension refers to achieving business efficiency by providing goods or services without violating social or environmental values. On the contrary, financial performance refers to improving the company's profits [10], which are achieved with or without CSR practices. Some sustainable elements are already considered in current CSR approaches; however, they have a different application level. LC methodologies incorporate indicators to assess and report the social and environmental performance of products and services [41].

CSR approaches present indicators focused on improving their performance in enterprises through specific practices related to their interests but not with the measurement of impact categories and long-term practices [3, 21].

Additionally, several conventional implemented means are based on legal and philanthropic compliance, whereas many CSR means only translate into basic legal requirements and charitable activities. Moreover, it was found that the six stakeholder groups are considered in both the sustainability and CSR approaches. However, similarly, as with principles, dimensions, and means, each approach contemplates them differently; i.e., CSR considers stakeholders in specific practices, while the sustainable approach measures the impact associated with each stakeholder category.

Second, the analysis of five case studies at the national and regional level showed that several CSR elements identified are already implemented by enterprises and, therefore, evidence that these case studies also incorporate sustainability aspects. However, the CSR practices implemented in enterprises are focused on achieving an excellent performance of the specific indicators. They do not take into account the integrated impact in the social and environmental dimensions. As a result, these actions have a low impact level. Both local and regional enterprises considered different principles, stakeholders, indicators, and means that showed the CSR implementation according to their specific context.

This implies that some CSR elements can be disregarded or considered following the enterprises' interests that commonly focus on promoting the corporate image. As a result, the application level of CSR in local and regional enterprises remains unclear. Moreover, CSR reports are commonly used in large enterprises, which have the resources to incorporate programs, projects, and other actions related to CSR. However, this does not represent the reality of other companies of different sizes. Future research is needed to identify the main differences in the CSR application among regions and diverse corporate sizes.

Finally, the SBSC is considered an essential tool to design and achieve the key objectives of corporate sustainability management and represents a suitable tool to incorporate CSR strategies. From both the social and environmental dimensions, the subcategories and indicators identified in the analysis scheme facilitated the proposal of the strategic objective and the inclusion of the sustainability approach.

The operationalization, visualization, and monitoring of indicators are crucial for corporate information with added value and transparency and for establishing strategic objectives that help companies implement an efficient sustainability strategy. However, it is necessary to consider the interactions between all perspectives of an SBSC [21]. According to Goldratt, the A0 structure leads the corporate strategy to improve profits now and in the future and includes two new Social and Environmental perspectives that establish sustainability criteria. In this manner, the A0 architecture maintains the traditional BSC hierarchy, as described in several studies, such as [8, 21, 38]. It also supports decisions that require trade-offs, considering a suitable design to integrate other perspectives, without changing the strategic maps of the companies [23]. Nevertheless, some authors believe that an adequate manner of implementing the sustainability approach corresponds to less traditional architectures that include this perspective transversely in all BSCs [19].

Thus, to determine a suitable option, it is necessary to analyze the specific objectives of each enterprise and their interactions with the indicators. Given that this study theoretically links CSR with sustainability indicators to structure an SBSC that man-

ages CSR, the selected architecture was adequate for this first version; however, more specific analyses should be carried out in future research.

In conclusion, in this study, the main CSR elements were identified, and the first version of an analysis scheme with a sustainability approach was proposed. It was found that the four CSR elements identified: Principles, Dimensions, Stakeholders, and Means help to analyze sustainability aspects in regional and local case studies. This finding shows that there are sustainability aspects embedded in the analyzed CRS implementations. However, CSR practices are specific to each enterprise and typically have limited impact. Additionally, the identified CSR elements were incorporated into a management dashboard structure. The results showed that the subcategories of social and environmental indicators contribute to the strategic objectives of the business formulation. The other elements identified are well adapted to fit the general structure of the SBSC.

Appendix A—Full list of references read in the literature review for the CSR analysis scheme The list of sources used in the literature review for the CSR analysis schema can be found online at <https://imageresearch.org/wp-content/uploads/2020/07/CSR-Appendix-A.pdf>

Appendix B—Full list of references read in the literature review for the SBSC scheme The list of sources used in the literature review for the CSR analysis schema can be found online at <https://imageresearch.org/wp-content/uploads/2020/07/CSR-Appendix-A.pdf>.

Acknowledgements This research was carried out under the projects “Enhancing the Social Value of the Circular Economy in Latin-American” and “Incorporating Sustainability concepts to management models of textile Micro, Small and Medium Enterprises (SUMA)” funded by the Flemish Interuniversity Council (VLIR) and the Research Direction of the University of Cuenca (DIUC).

References

1. Abernathy, J., Stefaniak, C., Wilkins, A., Olson, J.: Literature review and research opportunities on credibility of corporate social responsibility reporting. *Am. J. Bus.* **32**(1), 24–41 (2017). <https://doi.org/10.1108/ajb-04-2016-0013>, publisher: Emerald
2. Adelca: Quiénes somos (2018). https://www.adelca.com/quienes_somos.html, publication Title: adelca EL ACERO QUE NOS UNE
3. Ahi, P., Searcy, C.: A comparative literature analysis of definitions for green and sustainable supply chain management. *J. Clean. Prod.* **52**, 329–341 (2013). <https://doi.org/10.1016/j.jclepro.2013.02.018>, publisher: Elsevier
4. Arias, F.: *El Proyecto de Investigación Introducción a la metodología científica*. Editorial Episteme, Caracas, sexta edn. (2012)
5. Ashrafi, M., Magnan, G.M., Adams, M., Walker, T.R.: Understanding the conceptual evolutionary path and theoretical underpinnings of corporate social responsibility and corporate sustainability. *Sustainability* **12**(3), 760 (2020). <https://doi.org/10.3390/su12030760>, <https://www.mdpi.com/2071-1050/12/3/760>, publisher: MDPI AG
6. Ballou, B., Heitger, D.L., Donnell, L.: Creating effective dashboards. How companies can improve executive decision making and board oversight. *Strat. Financ.* **91**(9), 27–33 (2010)

7. Banker, R.D., Chang, H., Pizzini, M.J.: The Balanced Scorecard: Judgmental Effects of Performance Measures Linked to Strategy, vol. 79. American Accounting Association (2004). <https://doi.org/10.2308/accr.2004.79.1.1>, iSSN: 00014826, Publication Title: Accounting Review
8. Barbosa, M., Castañeda Ayarza, J.A., Lombardo Ferreira, D.H.: Sustainable strategic management (GES): sustainability in small business. *J. Clean. Prod.* **258**, 120880 (Jun 2020). <https://doi.org/10.1016/j.jclepro.2020.120880>, publisher: Elsevier Ltd
9. BCI: Dare to make a difference. Integrated Annual Report 2019 (2019), https://bci.modyocdn.com/uploads/58d3977d-f657-44ef-8441-04df9425824f/original/Memoria_BCI_ingles.pdf, publication Title: BCI
10. Bendell, J., Kearins, K.: The political bottom line: the emerging dimension to corporate responsibility for sustainable development. *Bus. Strat. Environ.* **14**(6), 372–383 (2005). <https://doi.org/10.1002/bse.439>, publisher: John Wiley & Sons Ltd
11. Benoit Norris, C., Traverso, M., Valdivia, S., Vickery-Niederman, G., Franze, J., Azuero, L., Ciroth A., Mazijn B., Aulisio, D.: Pre-publication version. The methodological sheets for sub-categories in social life cycle assessment (S-LCA). Technical report, United Nations Environment Programme (UNEP) and Society for Environmental Toxicology and Chemistry (SETAC) (2013). https://www.lifecycleinitiative.org/wp-content/uploads/2013/11/S-LCA_methodological_sheets_11.11.13.pdf
12. Bilicki, E., Roeder, R.: Operations dashboard (2016). <https://patents.google.com/patent/US9280777B2/en>
13. Caiza, G., Garcia, C., Naranjo, J., Garcia, M.: Flexible robotic teleoperation architecture for intelligent oil fields. *Heliyon* **6**(4) (2020). <https://doi.org/10.1016/j.heliyon.2020.e03833>
14. Caiza, G., Saeteros, M., Oñate, W., Garcia, M.: Fog computing at industrial level, architecture, latency, energy, and security: a review. *Heliyon* **6**(4) (2020). <https://doi.org/10.1016/j.heliyon.2020.e03706>
15. Cambridge University Press: MEANS | significado, definición en el Cambridge English Dictionary (2020). <https://dictionary.cambridge.org/es-LA/dictionary/english/means>, publication Title: Cambridge Dictionary
16. CNT: CNT - Telefonía fija y móvil, Internet y TV (2019). <https://www.cnt.gob.ec/>, publication Title: Cnt
17. Dahlsrud, A.: How corporate social responsibility is defined: an analysis of 37 definitions. *Corp. Soc. Responsib. Environ. Manag.* **15**(1), 1–13 (2008). <https://doi.org/10.1002/csr.132>, <https://onlinelibrary.wiley.com/doi/full/10.1002/csr.132>, <https://onlinelibrary.wiley.com/doi/abs/10.1002/csr.132>, publisher: John Wiley & Sons Ltd
18. Grupo Bimbo: INFORME ANUAL INTEGRADO 2019 (2019). https://grupobimbo.com/sites/default/files/Grupo-Bimbo-Reporte-Anual-2019_0.pdf, publication Title: Grupo Bimbo
19. Hanses, E.G., Schaltegger, S.: The sustainability balanced scorecard: a systematic review of architectures. *J. Bus. Ethics* **133**(2), 193–221 (2016). <https://doi.org/10.1007/s10551-014-2340-3>
20. Huijbregts, M., Steinmann, Z., Elshout, P., Stam, G., Verones, F., Vieira, M., Hollander, A., Zijp, M., van Zelm, R.: ReCiPe 2016 v1.1 A harmonized life cycle impact assessment method at midpoint and endpoint level Report I: Characterization. Technical report, National Institute for Public Health and the Environment (2017). https://www.pre-sustainability.com/download/Report_ReCiPe_2017.pdf
21. Iselin, E.R., Mia, L., Sands, J.: The effects of the balanced scorecard on performance: The impact of the alignment of the strategic goals and performance reporting. *J. Gen. Manag.* **33**(4), 71–85 (2008). <https://doi.org/10.1177/030630700803300405>, <http://journals.sagepub.com/doi/10.1177/030630700803300405>, publisher: Braybrooke Press
22. ISO: ISO 26000:2010(es), Guía de responsabilidad social (2010). <https://www.iso.org/obp/ui#iso:std:iso:26000:ed-1:v1:es>, publication Title: ISO
23. Kaplan, R.S., Norton, D.P.: Transforming the balanced scorecard from performance measurement to strategic management: part II. *Am. Account. Assoc.* **15**(2), 147–160 (2001)

24. Ketschau, T.: A conceptual framework for the integration of corporate social responsibility and human resource development based on lifelong learning. *Sustainability* **9**(9), 1545 (2017). <https://doi.org/10.3390/su9091545>, <http://www.mdpi.com/2071-1050/9/9/1545>, publisher: MDPI AG
25. Kotob, F.: What is sustainability? (2011). https://www.researchgate.net/publication/282184670_What_Is_Sustainability
26. Kruse, S.: Inclusion of social aspects in life cycle assessment of food. In: *Environmental Assessment and Management in the Food Industry*, pp. 219–233. Elsevier (2010). <https://doi.org/10.1533/9780857090225.3.219>
27. Latapí Agudelo, M.A., Jóhannsdóttir, L., Davídsdóttir, B.: A literature review of the history and evolution of corporate social responsibility. *Int. J. Corp. Soc. Responsib.* **4**(1), 1–23 (2019). <https://doi.org/10.1186/s40991-018-0039-y>, publisher: Springer Science and Business Media LLC
28. Liu, Y., Li, J., ting Quan, B., bi Yang, J.: Decision analysis and coordination of two-stage supply chain considering cost information asymmetry of corporate social responsibility. *Journal of Cleaner Production* **228**, 1073–1087 (2019). <https://doi.org/10.1016/j.jclepro.2019.04.247>, publisher: Elsevier Ltd
29. Mazzi, A.: Introduction. Life cycle thinking. In: *Life Cycle Sustainability Assessment for Decision-Making*, pp. 1–19. Elsevier (2020). <https://doi.org/10.1016/b978-0-12-818355-7.00001-4>
30. Möller, A., Schaltegger, S.: The sustainability balanced scorecard as a framework for eco-efficiency analysis. *J. Ind. Ecol.* **9**, 73–83 (2005). <https://doi.org/10.1162/108819805775247927>, iSSN: 10881980, Issue: 4, John Wiley & Sons, Ltd
31. Montalvo, W., Escobar-Naranjo, J., Garcia, C., Garcia, M.: Low-cost automation for gravity compensation of robotic arm. *Appl. Sci. (Switzerland)* **10**(11) (2020). <https://doi.org/10.3390/app10113823>
32. Montalvo, W., Garcia, C., Naranjo, J., Ortiz, A., Garcia, M.: Tele-operation system for mobile robots using in oil & gas industry [sistema de tele-operación para robots móviles en la industria del petróleo y gas]. *RISTI - Revista Iberica de Sistemas e Tecnologias de Informacao* **2020**(E29), 351–365 (2020), cited By 0
33. Person, R.: *Balanced Scorecards and Operational Dashboards with Microsoft Excel* - Ron Person - Google Libros. Tor Consulting Inc, Indianapolis and Canada, second edn (2013)
34. PRÉ: ReCiPe. PRÉ sustainability. Technical report (2011). <https://www.pre-sustainability.com/recipe>, publication Title: PRÉ
35. Pronaca: Procesadora Nacional de Alimentos. Technical report (2019). <https://www.pronaca.com/>, publication Title: PRONACA
36. Sala, S., Farioli, F., Zamagni, A.: Progress in sustainability science: lessons learnt from current methodologies for sustainability assessment: Part I. *Int. J. Life Cycle Assess.* **18**(9), 1653–1672 (2013). <https://doi.org/10.1007/s11367-012-0508-6>, publisher: Springer
37. Sarkar, S., Searcy, C.: Zeitgeist or chameleon? a quantitative analysis of csr definitions. *J. Clean. Prod.* **135**, 1423–1435 (2016). <https://doi.org/10.1016/j.jclepro.2016.06.157>, <http://www.sciencedirect.com/science/article/pii/S0959652616308447>
38. Schneider, R., Vieira, R.: Insights from action research: implementing the balanced scorecard at a wind-farm company. *Int. J. Prod. Perform. Manag.* **59**(5), 493–507 (2010). <https://doi.org/10.1108/17410401011052904>, publisher: Emerald Group Publishing Limited
39. UNEP: Social Life Cycle Assessment (S-LCA). Technical report (2013). <https://www.lifecycleinitiative.org/starting-life-cycle-thinking/life-cycle-approaches/social-lca/>, publication Title: Life Cycle Initiative, UN environment programme
40. UNEP: Life Cycle Approaches. Technical report (2014). <https://www.lifecycleinitiative.org/starting-life-cycle-thinking/life-cycle-approaches/>, publication Title: Life Cycle Initiative, UN environment programme
41. UNEP/SETAC: Guidelines for Social Life Cycle Assessment of Products. United Nations Environment Programme, Belgium (2009), publication Title: United Nations Environment Programme (UNEP) and Society of Environmental Toxicology and Chemistry (SETAC)

42. UNEP/SETAC: Guidance on orGanizational life cycle assessment (2015), www.lifecycleinitiative.org, publication Title: United Nations Environment Programme
43. UNEP/SETAC: Guidelines for Social Life Cycle Assessment 2020 Final_opt_0.pdf. Technical report (2020). <https://slcaguidelines.konveio.com/guidelines-social-life-cycle-assessment-v3-draft>, publication Title: Social Alliance, Life cycle Initiative - UNEP
44. Wang, H., Tong, L., Takeuchi, R., George, G.: Corporate social responsibility: an overview and new research directions. *Acad. Manag. J.* **59**(2), 534–544 (2016). <https://doi.org/10.5465/amj.2016.5001>, publisher: Academy of Management
45. Weinberger, K., Rankine, H., Amanuma, N., Surendra, L., van Hull, H.V., Foran, T., Reyes, R., Malik, A., Murray, J.: Integrating the three dimensions of sustainable development: a framework and tools 1. Greening of Economic Growth Series (2015). www.unescap.org
46. Zamagni, A., Pesonen, H.L., Swarr, T.: From LCA to Life cycle sustainability assessment: concept, practice and future directions. *Int. J. Life Cycle Assess.* **18**(9), 1637–1641 (2013). <https://doi.org/10.1007/s11367-013-0648-3>, publisher: Springer