

## Article

# Designing a Sustainability Assessment Framework for Peruvian Manufacturing Small and Medium Enterprises Applying the Stakeholder Theory Approach

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**Abstract:** Among the main obstacles affecting the competitiveness of Peruvian Small and Medium Enterprises (SMEs) are poor strategic planning and incipient use of management control systems that support the integration of sustainable practices for the growth of the organization. Not considering sustainability in the strategy and management control systems of Peruvian SMEs can jeopardize their stability and growth, as they are part of the supply chain of large companies that look for suppliers that comply with sustainability standards. Since manufacturing SMEs play a vital role in the economies and social welfare of countries, providing them with appropriate management tools to evaluate the sustainable performance of their activities is urgent to assure their survival. Thus, the aim of this study is to design a holistic sustainability assessment framework that enables Peruvian manufacturing SMEs to evaluate the full integration of sustainability into their business strategy and the creation of value for each stakeholder. Based on the gaps found in the literature review, a conceptual assessment framework was designed, then a multiple-case study was conducted in three Peruvian manufacturing SMEs in the plastic sector, and the data obtained were used to deploy the proposed conceptual assessment framework.

**Keywords:** sustainability; assessment framework; sustainability balanced scorecard; stakeholder theory; manufacturing SMEs



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## 1. Introduction

Currently, the promotion of the practice of sustainability is one of the most discussed topics worldwide. Since we are living in the Anthropocene, or the age of humans, the future of the Earth and humankind depends entirely on the actions and decisions that people take in the ambit in which they live or operate. Therefore, we need to execute a just transformation in the way we live and work [1].

Regarding the business context, the perceived importance of incorporating sustainability into corporate Strategy and Management Control Systems (MCS) has increased in recent years. It is crucial for organizations to incorporate sustainability into their strategy for generating a competitive advantage [2–4]. However, the integration of sustainability into corporate strategies has not yet been fully resolved, and the literature indicates that “more research is needed on dynamic capabilities for the achievement of sustainability, especially in emerging economies in general” [5].

Managers’ use of MCS can be instrumental in transforming management control practices to be congruent with sustainable development [6], but research addressing Corporate Sustainability Performance Measurement is still limited and remains in an explorative stage. This implies that managers remain orphaned of practical knowledge on how to account and assess the outcomes of their Corporate Sustainability activities [7].

Among the main entities whose actions affect the climate and society are manufacturing companies, since they play a vital role in the economies and social welfare of countries through the creation of jobs and have a significant impact on the three dimensions of sustainability, as they use a great number of resources in their production processes [8,9]. Manufacturing enterprises are the backbone of modern industrialized society and they always have been considered as the cornerstone of the world's economy [10].

Industrialization is a dynamic economic process that creates income and employment, enhances businesses, and uses resources efficiently [11]. The United Nations 2030 Agenda for Sustainable Development promotes “sustainable industrialization” under Goal 9: Industry, innovation, and infrastructure, which means “building resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation” [12].

Sustainable Manufacturing can therefore be considered as one of the most important issues to address to achieve sustainable development. Measuring, assessing, and developing an industrial sustainability performance is a critical issue [13–15]. However, there is a lack of structured methodological frameworks to assess sustainability of manufacturing organizations [16]. The literature indicates that very few examples of effective assessment processes in this type of organization can be found [17], and a well-balanced “indicator tool” is missing [18]. Thus, measuring industrial sustainability performance in manufacturing firms is still a major challenge [19].

For the above mentioned, it is especially necessary to evaluate the sustainable performance in manufacturing companies, and appropriate performance measures supported with suitable indicators are essential to assess how sustainable manufacturing organizations are.

Previous research has also found that the size of an organization influences its control arrangements [20], and that larger firms are more likely to adopt sophisticated management accounting techniques [21]. Larger organizations are likely to have a higher level of innovation given the availability of resources such as finance, high-quality staff, benefits from economies of scale, and better work organizations [22]. These characteristics in larger organizations facilitate the adoption of the sustainable concept into their control systems, which is not the case for small and medium-sized companies (SMEs).

It should be noted that SMEs play a very important role in social development mainly because they have a great capacity to generate employment—especially those that belong to the manufacturing sector—and wealth, which contributes to reducing poverty and increasing economic prosperity in households. SMEs around the world account for 99% of all businesses and between 50% and 60% of value added. In Peru, SMEs represent 99.6% of all formal companies [23]. A significant part of the population and the economy depends on the activity and performance of SMEs due to their recognized capacity to generate employment and their participation in production. Indeed, Peruvian SMEs contributed 33.3% of the national value added and generated jobs for 59.0% of the economically active population employed in 2019 [24].

Although SMEs also must respond to the challenges related to sustainable development, they lack, however, appropriate management tools to assess the status of sustainability based on key performance indicators [25].

One of the main issues in Peruvian corporations regarding sustainability and the environment is the lack of accurate reporting, accounting, and assessment [26]. Peruvian business managers of manufacturing SMEs in the plastic sector are aware that the inclusion of sustainability in business management benefit the environment, society in general, and their own firms, but they know neither how to incorporate sustainability in their business strategies nor how to measure it accurately [9]. In Peru, the Management Control Systems of manufacturing SMEs in the plastic sector are limited to the control of the short-term operational perspective, emphasizing economic and financial control, and there is a considerable lack of concrete measurements regarding social and environmental aspects [9].

Since SMEs face several specific obstacles like lack of resources in terms of personnel, time, and capital, the goal is then to develop a tool that is easily used and comprehended to be managed by manufacturing SMEs, while maintaining the holistic view of sustainability [25].

An ideal form of a sustainability assessment should comply with two characteristics: firstly, it should be a comprehensive assessment that spans over all pillars of sustainability, fully interconnected in terms of business's goals, objectives, critical success factors, and a set of indicators appropriate for analyzing performance of a complex socio-technical system [27,28]. Secondly, given that contemporary businesses operate in a "multi-stakeholder ecosystem paradigm", where the vital resources necessary for organizations' long-term survival are dependent on the stakeholder world [29,30], a sustainability assessment should make it possible to identify the needs and expectations of business stakeholders to help understand the core purpose of a specific business, because such identification is crucial for managers, as it can guide decision making [31].

The Sustainability Balanced Scorecard (SBSC) represents one of the most promising strategic tools to help organizations face these challenges and support their sustainability strategy [32]. However, past research has provided unclear, incomplete, and even contradictory SBSC frameworks while offering little knowledge about how to integrate stakeholders' management as well as environmental and social performance within the balanced scorecard to successfully support a corporate sustainability strategy [33].

Complementary to the sustainability performance assessment, organizations may require external reporting initiatives to communicate a company's sustainability performance to stakeholders as a means to create a competitive advantage [34]. Sustainability reporting might also contribute to other objectives of the company, such as improving reputations [35], and by improving their reputations, companies can in turn improve their competitive advantage, increase profit margins, attract investors, and increase the potential sales markets [36]. However, although the practice of account reporting has become increasingly important, the level of knowledge on sustainability reporting in emerging economies is poor [37,38], as is the case for Peru.

It is thus highly recommended that sustainability performance management and sustainability communication and reporting be linked and included within the same set of performance indicators to provide synergy and reliability between performance management and the external communication of performance [32].

The Global Reporting Initiative (GRI) framework has provided a new perspective to sustainability measurements and is the most popular framework for sustainability reporting worldwide [39]. In previous studies, the GRI framework was evaluated in terms of the accomplishment of three criteria: rapid assessment, application on factory level, and holistic view of sustainability. The results show that to use the GRI framework meets two fundamental criteria for evaluating sustainability in manufacturing companies: application on a factory level and a holistic view of sustainability but does not allow for a rapid assessment due to the large number of indicators used to measure sustainability [25]. In this regard, it is necessary to choose a set of indicators that allow for a quick and effective measurement of sustainability in manufacturing SMEs.

In view of the above-mentioned information, the gaps that this study intends to fill are the lack of management tools to assess the status of sustainability based on an appropriate set of key performance indicators in manufacturing SMEs and the little knowledge about how to integrate stakeholders' management as well as environmental and social performance within a management tool to successfully support a corporate sustainability strategy.

The aim of this study is to therefore design a holistic performance assessment framework that enables Peruvian manufacturing SMEs to evaluate the full integration of sustainability into their business strategy and the creation of value for each stakeholder.

To this end, the following research question are posed:

RQ1: Which are the main SBSC architectures?

RQ2: How is the Stakeholder Theory being applied in Sustainability Management?

RQ3: How could the three aspects of sustainability be effectively incorporated into an assessment tool, considering explicitly the creation of value to all business stakehold-

ers to measure, monitor, report, and manage the sustainable performance of Peruvian manufacturing SMEs?

As a result of the study, we are proposing the “SMEs’ Sustainability Balanced Scorecard” (SMESBSC), a specific SBSC that integrates the three pillars of sustainability performance within four different perspectives, namely the Sustainability perspective (instead of the traditional Financial perspective), External Stakeholders perspective (instead of the Customer perspective), Internal Business Processes perspective, and Learning and Growth perspective.

The proposed assessment framework will be developed by choosing a set of indicators that will be aligned with the strategic objectives of the enterprises in study and the GRI Standards and will be focused on the three aspects of sustainability and will be incorporated through the four perspectives of the proposed SMESBSC to allow visualizing of the interconnections between them to make it possible to monitor and manage the results of companies in a holistic sustainable manner.

The remainder of the paper is organized as follows: In Section 2, the research methodology is described. In Section 3, the theoretical background is presented, including the definitions of the main theoretical concepts used in this study. In Section 4, a literature review on SBSC architectures, and the Application of the Stakeholder Theory in Sustainability Management, is conducted. In Section 5, the Proposed Conceptual Sustainability Assessment Framework is presented. Section 6 shows the findings of the Multiple-Case Study, and based on them, the deployment of the proposed conceptual framework is presented. In Section 7, a discussion and the conclusions of the study are provided.

## 2. Methodology

The present study was carried out as follows: firstly, a literature review on SBSC architectures, and on the Application of the Stakeholder Theory in Sustainability Management, was conducted. Based on the gaps identified in the literature review, we proposed the conceptual holistic sustainability assessment framework denominated “SMEs’ Sustainability Balanced Scorecard” (SMESBSC). Secondly, a multiple-case study was conducted to explore how Peruvian manufacturing SMEs in the plastic sector currently evaluate sustainable performance in their companies as a case to identify and analyze the shortcomings that need to be corrected and, on this basis, deploy the proposed conceptual holistic sustainability assessment framework based on the answers given by the interviewees regarding the strategic objectives and indicators that should be considered to enable them to evaluate both the full integration of the three pillars of sustainability into business organizations and the creation of value for each stakeholder.

### 2.1. Data Collection

Data were obtained from three Peruvian manufacturing SMEs in the plastic sector through five semi-structured interviews (see Figure 1).

We have only considered these three companies because they are the most representative SMEs in the plastic sector according to their market share.

It is important to mention that one of the five interviews was conducted with the President of the Plastics Committee of the National Society of Industries of Peru, which is the highest governing body of the plastics industrialists’ guild of Peru; thus, his opinion includes the opinion of the entire Peruvian plastics sector guild.

### 2.2. Construction and Design of the Interview Questionnaire

Each semi-structured interview consisted of twenty-two open questions (see Appendix A). The interviews were structured as follows: Personal Data, Company Data, Management Control Information, Strategic Planning, Control and Performance Measurement, and Sustainability Reporting. Each interview was video recorded, transcribed, and sent to the interviewee for validation.

ENTERPRISE	INTERVIEW	INTERVIEWEE CHARGE	INTERVIEWEE'S GUILD POSITION	ENTERPRISE SIZE	MAIN PRODUCT LINE	MAIN PRODUCTION PROCESS
A	1	GENERAL MANAGER	PRESIDENT OF THE PLASTICS COMMITTEE OF THE NATIONAL SOCIETY OF INDUSTRIES OF PERÚ	MEDIUM	THERMOFORMED PACKAGES	THERMOFORMING MOLDING
	3	CHIEF OF PRODUCTION				
B	2	GENERAL MANAGER		SMALL	BAGS AND FILMS	EXTRUSION AND BLOW MOLDING
C	4	GENERAL MANAGER		MEDIUM	ARTICLES FOR CLEANING	INJECTION MOLDING
	5	CHIEF OF PRODUCTION				

**Figure 1.** Interviews conducted.

Additionally, we would like to mention that the questionnaire was designed not only to gather information on sustainability but also on the control systems used and the use of the Balanced Scorecard.

In this regard, questions 8, 9, 10, 11, 14, 21, and 22 are directly linked to sustainability. The other questions are linked to the management control systems used by these companies and the use of the BSC. This approach allowed us to extract very important information to propose the framework for sustainable management for Peruvian SMEs.

It is also worth mentioning that not all the questions have the same weight. For example, question 22 is weighted more than other questions because we were able to deploy our proposed theoretical framework from the answers to this question.

Finally, we must emphasize that, as previously mentioned, this is a semi-structured interview, where the questionnaire is only a guide, and that in case the interviewer is not satisfied with the answers given by the interviewee, he usually asks additional questions to deepen the ideas related to the concept.

### 2.3. Designing and Deployment of the Sustainability Assessment Framework

As mentioned above, the first step we took was designing the conceptual holistic sustainability assessment framework denominated "SMEs' Sustainability Balanced Scorecard" (SMESBSC) in order to fill the gaps detected in the literature review conducted.

The second step we then took in this study was deploying the proposed conceptual framework to translate it to a particular reality so that it can be used in practice. For this purpose, we used the findings obtained from the multiple-case study we conducted and based on the answers given by the interviewees, a strategic map was drawn up and then a set of suitable indicators were defined to monitor the progress of the proposed strategic objectives.

## 3. Theoretical Background

To contextualize the theoretical aspects that define this research, in this section, the theoretical background is presented, including the definitions of the main theoretical concepts used in this study.

### 3.1. Sustainability

The term sustainability was originally coined in Germany as “Nachhaltigkeit”, which means “sustained performance”. This term appeared in 1713 in a forestry manual, referring to the practice of never harvesting more than the forest can regenerate [40]. However, the concept of “sustainable development” was first formulated in 1987 in the report “Our Common Future”, also known as the Brundtland Report, produced by the United Nations World Commission on Environment and Development under the chairmanship of Gro Harlem Brundtland, in which it is mentioned that sustainable development is a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are carried out in a consistent manner, taking into account present and future needs. In other words, it must “meet the needs and aspirations of the present without compromising the ability of future generations to meet their own needs” [41]. It is this definition that has laid the foundation for the development of thinking on sustainability to the present day.

As a result of the aforementioned theoretical concept of “sustainability” of political origin, given by the UN, it surges the business approach theory of the “Triple Bottom Line” presented by John Elkington in 1997, in his work “Cannibals with forks”, in which the author puts forward for the first time the idea that, in order for a company to be sustainable, it must guarantee a triple result: to be economically viable, to be socially beneficial, and to be environmentally responsible [42].

### 3.2. The Stakeholder Theory

The Stakeholder Theory was proposed in 1984 by Dr. F. Edward Freeman, professor at the University of Virginia, in his book “Strategic Management: A stakeholder approach” [43]. In his development of stakeholder theory, Freeman defines a stakeholder as “any group or individual who can affect or be affected by the achievement of the organizational objectives”. This theoretical approach stresses the importance for companies to consider the positions of different stakeholders, such as employees, customers, suppliers, governments, credit lenders, and financiers, in their decision-making processes.

Freeman’s theory suggests that the true success of a company lies in the satisfaction of all its stakeholders, not only those who could benefit from its actions, in contrast to what was proposed by Milton Friedman in 1970 [44], who considered the satisfaction of shareholders’ expectations as a priority.

Customers, owners, financiers, employees, and suppliers are the basic elements of any business model, and they are inextricably linked. So, rather than seeing these stakeholders as unrelated entities separated from the firm, taking a value-creation view of stakeholder theory, or adopting the relational view of stakeholder theory, it is impossible to view the firms’ interests as unrelated to, or separate, from other stakeholders [45]. Companies need to balance their economic objectives with stakeholder’s expectations [46,47]. Their profits and survival depend critically on building a long-term relationship with their stakeholders [48].

By understanding and enhancing this relationship, companies can gain competitive advantage in terms of knowledge-sharing practices, participatory decision-making, effective governance, and innovation [49,50].

### 3.3. Balanced Scorecard and Sustainable Balanced Scorecard

The Balanced Scorecard (BSC) was developed in its original form by Kaplan and Norton (1992) [51], to alleviate problems arising from the wide use of financial results’ control systems and accounting measures, such as transaction-based orientation, focus on the past, lack of congruence with changes in firm value, and short-termism, which can cause myopic decision-making [52].

The BSC is a management tool that allows implementing and managing the strategy at all levels. According to Kaplan and Norton [51,53], in regard to the representation of the business strategy in a coherent structure, through objectives clearly linked to each other, through cause–effect relationships, and to measure the progress of the strategy, it uses a

combination of measures or performance evaluation indicators, focused on four perspectives: financial, customer, internal processes, and organizational learning and growth.

The increasing strategic importance of environmental, social, and ethical aspects and related performance metrics have inspired debates about extensions and alterations to the BSC, sometimes referred to as the Sustainability Balanced Scorecard (SBSC) [54]. Thus, the concept of SBSC was derived from the conventional BSC combining the four perspectives of the BSC with the sustainability dimensions to embed environmental, social, or ethical concerns explicitly and including sustainability-related objectives and performance measures. The SBSC may be a viable tool to satisfy a range of sustainability management needs, namely, to assist companies in the process of implementation of a sustainable strategy, foster sustainability management standards, decision-making, and reporting, support regulatory data requirements, meet stakeholders' information demands, and make employees more sensitive to sustainability issues [32,55].

#### 4. Literature Review

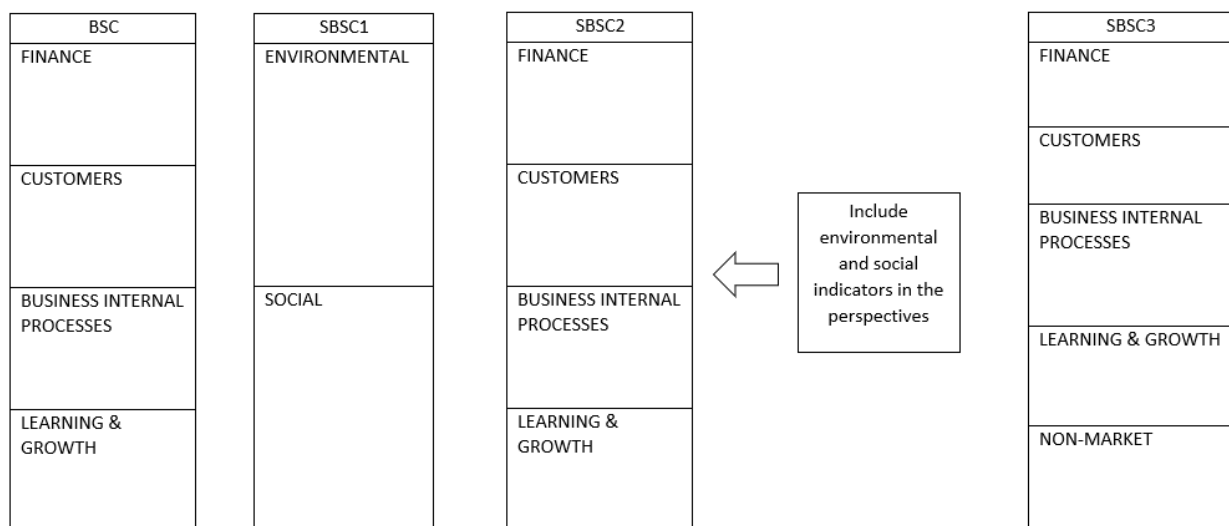
In this section, we will show the main findings of the literature review in relation to the research questions posed.

##### 4.1. SBSC Architectures

According to the literature review conducted, in our opinion, there are two articles that mark a milestone regarding the architectures of sustainability balanced scorecards.

The first one is “The sustainability balanced scorecard—linking sustainability management to business strategy” by Figge et al. [54], which is the most cited article in SBSC research [52].

In their article, Figge et al. mentioned that three main SBSC designs are proposed in the literature: (i) the creation of a derived environmental and social scorecard, (ii) the integration of environmental and social aspects within the four conventional balanced scorecard perspectives, and (iii) the introduction of an additional perspective [54], (see Figure 2).



**Figure 2.** The three main SBSC designs.

The second one is: “The Sustainability Balanced Scorecard: A Systematic Review of Architectures” by Hansen and Schaltegger [56]. In this article, the authors found that there are three types of SBSC architectures: Strictly hierarchical, Semi-hierarchical, and Non-hierarchical (see Figure 3). The importance of this study lies in the fact that it presents a comprehensive systematic literature review of 69 articles that focuses on two main areas: (1) a typology of hierarchies of SBSC architecture; and (2) how the sustainability

parameters have been incorporated into the SBSC architecture and how they relate to corporate sustainability strategies [56].

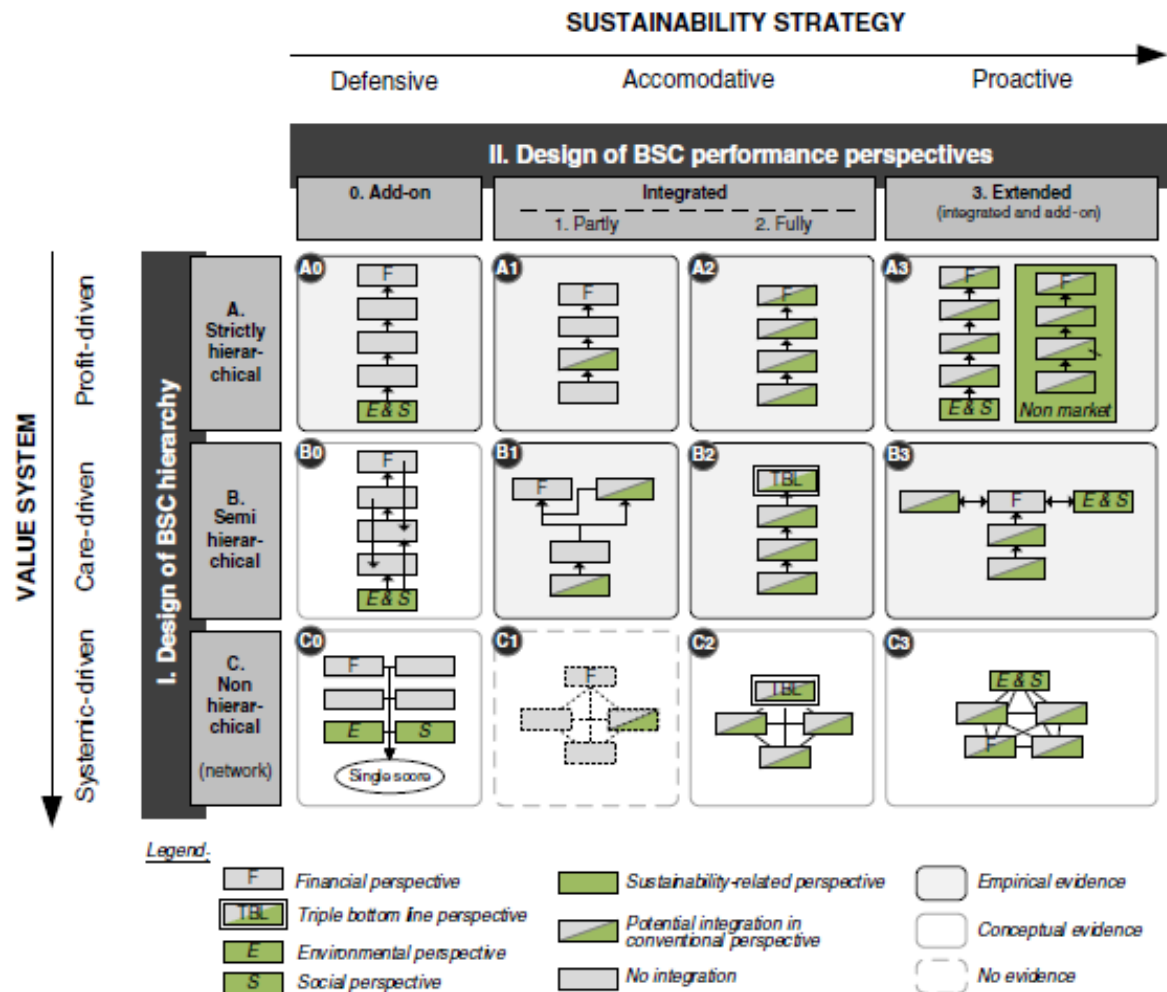


Figure 3. The three SBSC architectures. Source: Hansen and Schaltegger (2016) [56], (p. 205).

The following is a brief description of each of these architectures:

- Strictly hierarchical

The strictly hierarchical architecture maintains the conventional hierarchy of the BSC, mentioned by Figge et al. [54]. This architecture takes a strong instrumental perspective based on concepts such as competitive advantage and the business case for sustainability. It is not surprising that the financial perspective is the dominant perspective in the overall sample. A strict SBSC hierarchy best resembles a “profit-driven value system”. Sustainability is considered to be an opportunity to achieve success, reduce risks, and enhance reputation or image [57].

- Semi-hierarchical

The semi-hierarchical SBSC is rooted most strongly in social/political and normative theory. Concerning the architecture, the semi-hierarchical SBSC involves two interrelated modifications: first, strictly causal relationships from each strategic objective to financial performance are rejected [58]. A second modification of the SBSC architecture is a broadening of the financial perspective from a focus solely on the financial bottom line of organizational performance to the triple bottom line. The semi-hierarchical architecture (with a triple bottom line perspective or multiple individual perspectives at the top) allows the pursuit of environmental and social objectives in their own right. It thus aims at repre-

senting a “new governance structure” with “shareholder value being balanced with the interests of other legitimate stakeholders” [57] (p. 152). If an organization’s strategy aims at pursuing multiple goals or at satisfying multiple stakeholders, then the BSC design should represent this plurality to enable a successful strategy implementation. However, overall, compared to the strictly hierarchical SBSC, fewer publications propose the semi-hierarchical SBSC [56]. The semi hierarchical SBSC is based in a “care-driven value system” characterized by “a sense of community and unity”, “fairness”, and the belief that “co-operation beats competition” [57] (p. 152).

- Non-hierarchical (Network)

The non-hierarchical SBSC is predominantly a normative phenomenon [59,60]. But its feasibility in practice is uncertain [61]. It is probably for this reason that this fairly radical deviation from the conventional BSC architecture has so far remained predominantly a normative and conceptual undertaking (i.e., no empirical papers) and poorly investigated phenomenon [56]. The non-hierarchical architectures reflect a “systemic driven value system” and are characterized by “flexibility and open systems”, “networks”, “alignment [...] between the various entities within the network, including stakeholders” and the ability “to learn from any source” [57] (p. 155).

In summary, the literature reveals three different approaches to hierarchy (strictly, semi-, and non-hierarchical) which are contingent on the organizational value system (profit, care, and systemic driven) [56].

With respect to Corporate Sustainability Strategy, the sustainability objectives can be partly or fully integrated into the conventional four BSC perspectives and they can be added as a dedicated sustainability perspective complementing the four conventional BSC perspectives. This leads to four combinations representing an increasing degree of integration in the following order: adding a sustainability perspective only (add-on); partial integration into existing perspectives (partly integrated); complete integration into existing perspectives (fully integrated); and simultaneous integration into existing perspectives while adding a dedicated perspective (extended) [56].

#### 4.2. The Application of the Stakeholder Theory in Sustainability Management

It is not surprising that stakeholder theory has become one of the most frequently used theoretical approaches in sustainability management research [31].

However, stakeholder theory has so far not been systematically applied to issues such as performance measurement [33]. Environmental and social activities are seen as possible means to creating positive financial ends [62]. By subordinating all sustainability management activities to profit maximization, business success is understood in a narrow sense; that is, maximizing profits, and not in a broader sense of creating value [63].

From a stakeholder theory perspective, the currently used operationalization of business success has a very narrow, purely financial perspective on business success and does not employ a broader socioeconomic understanding of business success as value creation for stakeholders [64]. A large body of literature deals with whether social and environmental activities or performance, respectively, relate positively or negatively to financial performance [65–68]. In this opportunistic view, sustainability is promoted if profitable and financial goals are top and environmental and social issues subordinate, contradicting the Stakeholder theory which highlights that to contribute to sustainable development, a business needs to consider stakeholder relationships explicitly by designing its sustainability propositions in a way that they create value for each stakeholder [31]. This hierarchic and opportunistic view of sustainability must be changed for an interlinked perspective of synergistically oriented business sustainability. Solutions should be seen as the attempt to search for approaches that satisfy different goals at the same time [31].

## 5. The Proposed Conceptual Sustainability Assessment Framework

The main gaps found in the literature review on SBSC architectures, and on the Application of The Stakeholder Theory on Sustainability Management, are that most sustainability assessment frameworks that make environmental and social aspects subordinate to economic aspects, do not incorporate all stakeholders nor describe their interactions, and suggest a set of indicators that are not well fitted for manufacturing companies.

Regarding the findings concerning SBSC architectures, in the article by Figge et al. [54], the following was observed: as was mentioned in this article, there are three main SBSC designs: (i) the creation of a derived environmental and social scorecard, (ii) the integration of environmental and social aspects within the four conventional balanced scorecard perspectives, and (iii) the introduction of an additional perspective [54]. The main problem with the first design (the parallel scorecard) is its lack of relevance to the organization's main activities. Failing to link the environmental and social aspects to financial value creation, the dedicated scorecard failed to address the strategic needs of the organizations involved. The second option proposed involves the integration of environmental and social aspects within the four traditional balanced scorecard perspectives. However, the four perspectives embedded within the conventional scorecard remain almost exclusively anchored to the economic sphere. The third SBSC design option involves the expansion of the conventional balanced scorecard by adding a fifth component. But there is a lack of consensus about of this perspective, as some authors suggest the introduction of a "non-market" perspective within the traditional balanced scorecard that includes the strategically relevant "non-market" environmental and social aspects [54]. Others suggest adding an eco-perspective component to the conventional balanced scorecard that is mainly related to environmental issues [69].

Additionally, concerning the problems mentioned, it should be noted that all the designs are focused on the financial results contradicting the Stakeholder Theory. Furthermore, the management of all stakeholders has not been explicitly considered in any of the designs showed. The customers are the only external stakeholders that have been explicitly considered.

With respect to the findings in the article by Hansen and Schaltegger [56], the strictly hierarchical architecture maintains the conventional hierarchy of the BSC focused on financial results and is the dominant architecture in the overall sample. Conversely, compared to the strictly hierarchical SBSC, fewer publications propose the semi-hierarchical SBSC. And regarding the non-hierarchical architecture, its feasibility in practice is uncertain and has so far remained predominantly a normative and conceptual undertaking and poorly investigated phenomenon.

Regarding the findings from the stakeholder theory perspective, an ideal form of a sustainability assessment should comply with two characteristics: firstly, it should be a comprehensive assessment that spans over all pillars of sustainability, fully interconnected in terms of business's goals, objectives, critical success factors, and a set of indicators appropriate for analyzing performance of a complex socio-technical system [27,28]. Secondly, a sustainability assessment should make possible to identify the needs and expectations of business stakeholders to help understand the core purpose of a specific business, because such identification is crucial for managers, as it can guide decision making [31]. In this sense, we can affirm that most of the architectures previously shown do not fully comply with these characteristics: the hierarchical one never does, and as for the semi-hierarchical and non-hierarchical ones, there are very few practical and explicit examples. Thus, rather than helping firms to adapt their strategy to sustainability challenges, the most SBSC frameworks focuses on improving financial performance at the organizational level.

Consequently, according to the previous mentioned, and in order to answer the third research question posed in this work and address the gaps identified in the literature review, we are therefore proposing the "SMEs' Sustainable Balanced Scorecard" (SMESBSC) (Figure 4), a specific SBSC that integrates the three pillars of sustainability performance within four different perspectives, namely the Sustainability perspective (in-

stead of the traditional Financial perspective), External Stakeholders perspective instead of the Customer perspective), Internal Business Processes perspective, and Learning and Growth perspective.

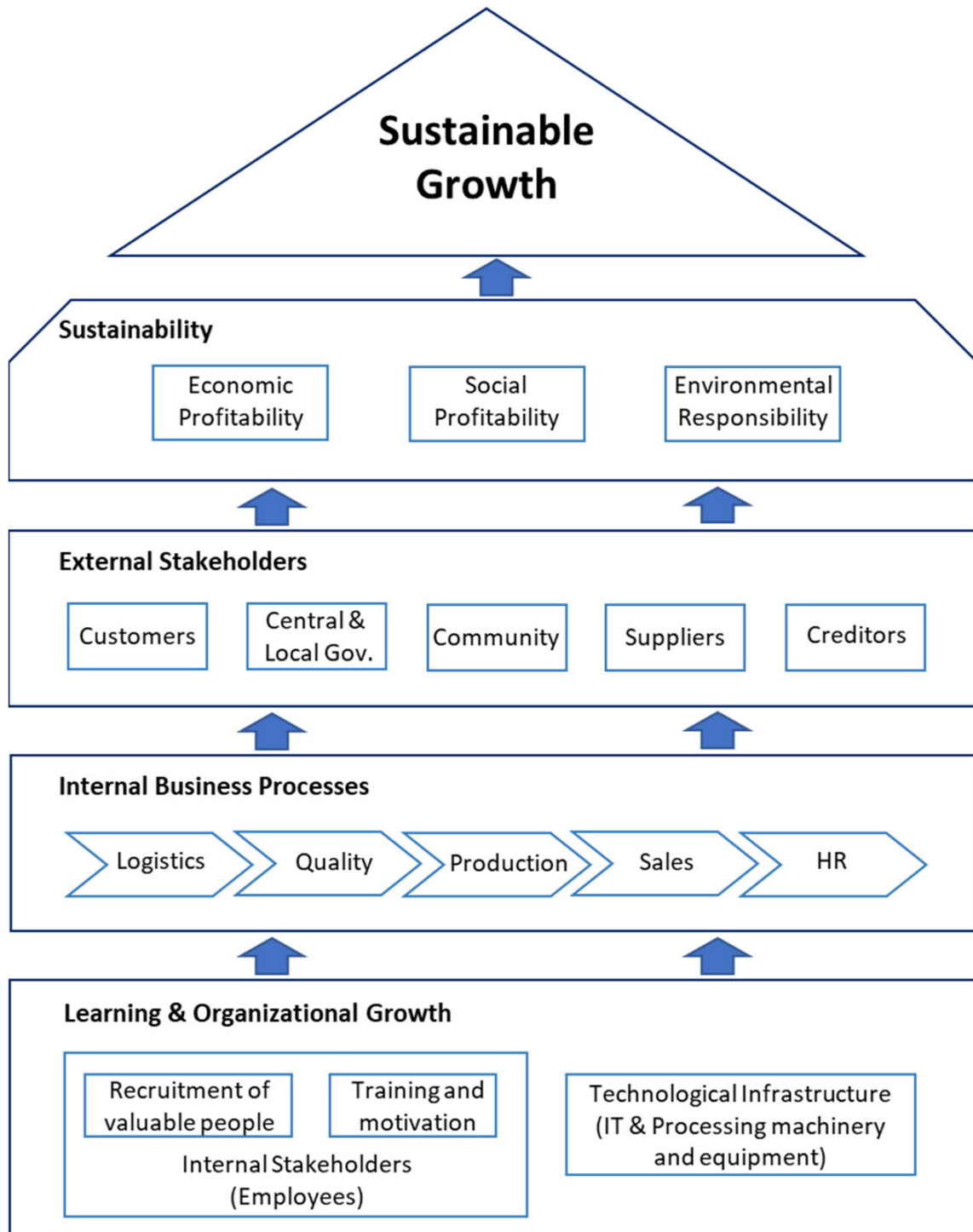


Figure 4. Proposed conceptual framework.

According to the literature reviewed [56], the proposed framework is a SBSC of the fully integrated Semi-hierarchical type (see Figure 3), which replaces the financial perspective, focused only on financial results, with the “Sustainability” perspective focused

on the triple bottom line. But the proposal differs in that it also replaces the traditional “customer” perspective with the so-called “External Stakeholders” perspective.

The proposed framework takes as its basis the framework proposed by Journeault [33], who proposed a SBSC of the partly integrated Semi-hierarchical type (see Figure 3). The major difference is that in our proposed framework, in the sustainability perspective, social and environmental outcomes are not subordinate to economic outcomes. In our proposed conceptual framework, in the sustainability perspective, it is clearly noted that not only the economic aspect, but the three aspects of sustainability are sought to create value. In addition, in the perspective of external stakeholders, the management of all external stakeholders of the business is being considered and not only the management of customers as it is considered in the three traditional designs of the SBSC. As for the perspective of internal business processes, all activities included in the value chain will be measured considering the three aspects of sustainability and not only the economic aspect. And, in the perspective of organizational learning and growth, performance measurement will focus on two topics, firstly on the performance of internal stakeholders such as employees, focusing on talent recruitment and continuous training and motivation, and secondly, on the technological infrastructure, including both information technology and machinery and process equipment.

## 6. Multiple-Case Study

As was previously mentioned, a multiple-case study was conducted in three Peruvian manufacturing SMEs in the plastic sector to explore how they currently evaluate sustainable performance in their companies as a case to identify and analyze the shortcomings that need to be corrected and, on this basis, deploy the proposed conceptual holistic sustainability assessment framework based on the answers given by the interviewees regarding the strategic objectives and indicators that should be considered to enable them to evaluate both the full integration of the three pillars of sustainability into business organizations and the creation of value for each stakeholder.

In general, the findings of this Multiple-Case Study show that among the greatest obstacles affecting the competitiveness of Peruvian Manufacturing SMEs in the plastic sector are poor strategic planning and incipient use of management control systems that support the integration of sustainable practices for the growth of the organization. Additionally, obstacles include weak management to strengthen and capitalize on the relationships they have with their respective stakeholders, and barriers to access to information technology and training of employees on sustainability management.

### 6.1. Deployment of the Proposed Sustainable Assessment Framework: “SMEs’ Sustainable Balanced Scorecard” (SMESBSC)

The next step we took in this study was deploying the proposed conceptual framework to translate it to a particular reality so that it can be used in practice. For this purpose, we used the findings obtained from the multiple-case study we conducted and based on the answers given by the interviewees, a strategic map was drawn up and then a set of suitable indicators were defined to monitor the progress of the proposed strategic objectives.

#### 6.1.1. SMESBSC Strategy Map

In question 22 of the interview (see Appendix A), based on the answers to the previous 21 questions given by the interviewees and on our experience as business consultants, we drew up a list of strategic objectives linked to each of the perspectives of the proposed assessment framework. Then according to the answers given by the interviewees regarding the proposed strategic objectives that should be considered, the strategy map was drawn up (see Figure 5). This strategy map provides a visual representation of the cause-and-effect relationships between the strategic objectives that support the development and implementation of the organization’s sustainability strategy in accordance with the proposed conceptual framework.

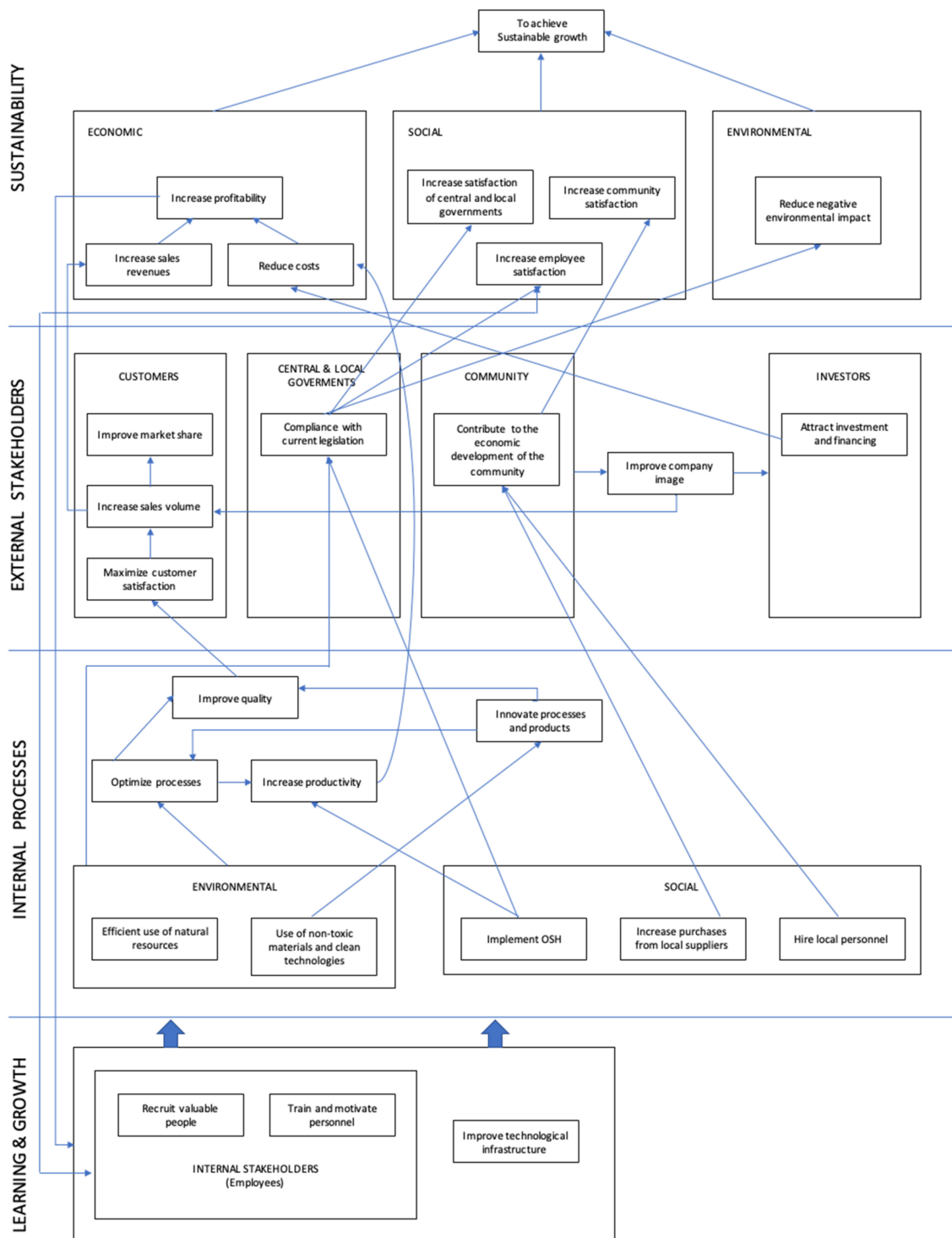


Figure 5. Proposed SMESBSC strategy map.

### 6.1.2. SMESBSC Performance Assessment Indicators

Metrics are needed to measure progress towards the achievement of sustainability and identifying appropriate sustainability indicators is an important challenge [70]. Thus, to evaluate the success of each of the strategic objectives proposed in the strategy map, a set of appropriate indicators was selected (see Table 1).

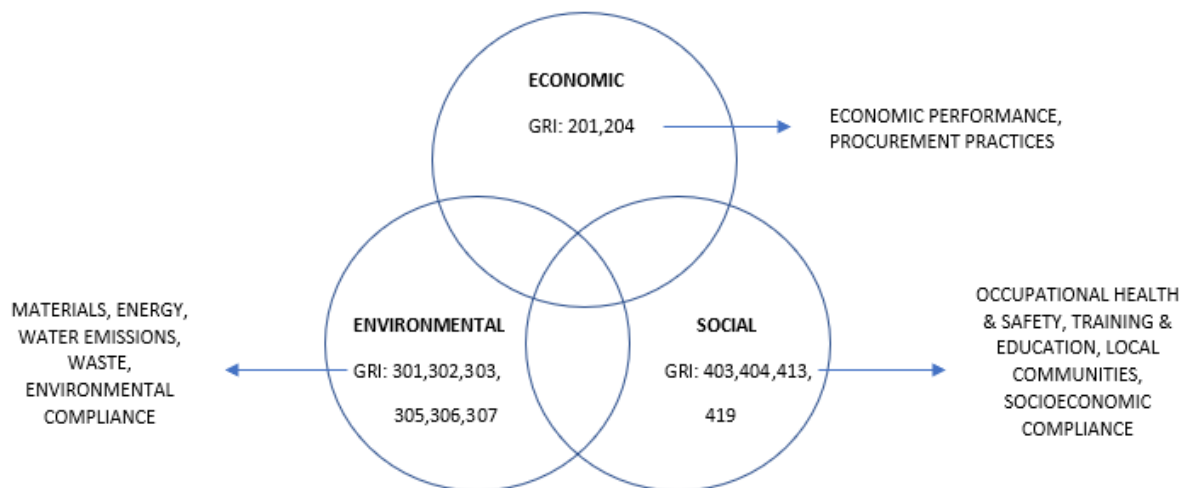
**Table 1.** Proposed SMESBSC performance assessment indicators.

<b>SUSTAINABILITY PERSPECTIVE</b>		
<b>ASPECT</b>	<b>STRATEGIC OBJECTIVES</b>	<b>INDICATORS</b>
Economic Profitability	Increase Profitability Increase sales revenues Reduce costs	Net earnings, Operating Profit, EBIT, ROI, ROE, ROA, ROACE. Net sales Total Operating cost
Social Profitability	Increase community satisfaction Increase satisfaction of central and local governments Increase employee satisfaction	Community satisfaction surveys, Number of complaints from neighbors (due to noise, dust, odor) Reduction in the number of penalties for non-compliance with social and environmental legislation compared to previous year Job satisfaction surveys
Environmental Responsibility	Reduce negative environmental impact	Air emissions per Unit of production (UP), Wastewater per UP, COD (Chemical Oxygen Demand) emissions into surface waters per UP, Emissions of heavy metals into surface waters per UP, Waste for recycling and disposal per UP.
<b>EXTERNAL STAKEHOLDERS PERSPECTIVE</b>		
<b>ASPECT</b>	<b>STRATEGIC OBJECTIVES</b>	<b>INDICATORS</b>
Customers	Improve market share Increase sales volume Maximize customer satisfaction	% Of Market share Volume of products sold % of product devolutions, % customer loyalty, satisfaction surveys
Central & Local Governments	Compliance with current legislation	Number of penalties for non-compliance with social and environmental legislation
Community	Contribute to the economic development of the community Improve company image	Number of community development programs Amount of donations to local community Surveys, Number of new clients
Investors	Attract investment and financing	Total external investment, amount of loans received from financial institutions.

Table 1. Cont.

INTERNAL PROCESSES PERSPECTIVE		
ASPECT	STRATEGIC OBJECTIVES	INDICATORS
Logistics	Increase purchases from local suppliers	Purchases from local suppliers relative to Total purchases
Quality	Improve quality	% of defective products, product return rate.
Production		% losses, % reprocesses, % shrinkage, number of machine downtime hours.
		Total productivity, Material consumption per UP (Overall, virgin, recycled, reused, remanufactured)
	Optimize processes	R&D investment.
	Increase productivity	Energy consumption per UP, Water consumption per UP.
	Innovate processes and products	Consumption of hazardous substances per UP.
Efficient use of natural resources	Percentage of hours of training regarding health and safety relative to the total number of hours, Number of fatalities at work, Lost-time accidents, Lost-time accidents relative to the total hours, Percentage of total absence-hours on health and safety grounds relative to the total hours worked, Number of compensated occupational diseases.	
Use of non-toxic materials and clean technologies		
Implement OSH		
Sales	Increase new product offerings	New products launched per year
HR	Hire local personnel	Number of local employees relative to the total number of employees.
LEARNING AND ORGANIZATIONAL GROWTH PERSPECTIVE		
ASPECT	STRATEGIC OBJECTIVES	INDICATORS
Employees (Internal stakeholders)	Recruit valuable people	N° of professionals and technicians hired
	Train and motivate personnel	Total hours of employee training per year, Investment on employee training, Number of implemented employees' improvement initiatives.
Technological Infrastructure	Improve technological infrastructure	New technology acquisitions (IT and Plant Machinery and Equipment)

Since the GRI framework allows each company the flexibility to report on issues of most relevance for the company and its stakeholders [71], we have selected indicators aligned to the GRI standards 201, 204, 301, 302, 303, 305, 306, 307, 403, 404, 413, and 419 (see Figure 6), because these standards are focused on the aspects most closely related to the management of manufacturing companies like pollution prevention, reduction of harmful emissions, waste minimization, cost reduction resulting from progress on eco-efficiency issues, product innovation, better relationships with regulators through legal compliance, retention and winning of customers that recognize environmental and social values; employee health and safety care, employee training and a contribution to fulfilling social needs, among others.



**Figure 6.** GRI standards considered.

It should be mentioned that the corresponding indicators were selected from a complementary literature review [33,72–75] and subsequently validated by the Peruvian businessmen interviewed.

## 7. Discussion and Conclusions

### 7.1. Discussion

Based on the findings about the sustainable management currently carried out in Peruvian manufacturing SMEs in the plastics sector, we can affirm that this situation can jeopardize not only the stability of their business, but their very existence for the following reasons: firstly, it is known that SMEs are part of the supply chain of large companies as suppliers [76]. In this regard, it should be mentioned that in May 2021, the “Responsible Buyers Network” was created in Peru, sponsored among others by the GRI and the association of companies “Perú Sostenible”, which is made up of eighty-two large national and transnational companies from sixteen productive and services sectors [77], whose objective is to have access to suppliers that, in addition to being competitive, comply with the expected sustainability standards [78]. Within the list of responsible suppliers, the majority are SMEs; however, there are no companies registered of the plastics sector, which indicates the urgent need for SMEs in this sector to adopt sustainability in the management of their companies. Otherwise, their competitiveness and survival will be seriously affected. Secondly, regarding the dynamics of exports, most of the Peruvian companies dedicated to this sector are SMEs, but the volume of exports is still small compared to the numbers corresponding to large companies. SMEs only contribute 9% of the total value of exports in 2018 [79]. One of the ways in which these entities can access international markets is by demonstrating that they are sustainable companies, and this is achieved by preparing reports of sustainability. In this regard, 73% of the 250 largest companies in the world (G250)

use the GRI Sustainability Report and, in addition, more than 168 policies in 63 countries and regions reference or require the GRI Standards for their regulations [80].

Thus, accordingly to the previous mentioned, we are sure that the proposed evaluation framework will help Peruvian manufacturing SMEs in the plastic sector to manage their businesses efficiently and sustainably both internally and externally. This statement is supported by the fact that the literature reviewed indicates that the SBSC is one of the most recommended management tools to manage sustainability in companies [32]. Application of SBSC as a performance evaluation method has increased in recent decades, mainly in large companies around the world due to stringent governmental regulations regarding these aspects [76]. In addition, it is known that large Peruvian companies already use the BSC to control and manage their businesses, including the measurement of some social and environmental aspects [9], therefore it is very convenient for Peruvian manufacturing SMEs to adopt this management tool since they are part of the supply chain of large companies. Logically and in a complementary manner, these companies must implement integrated information systems and train their employees in the use of this tool. Regarding sustainability reporting systems, although this type of reporting is not yet mandatory in Peru, it is necessary for Peruvian manufacturing SMEs in the plastics sector to start working with the GRI standards, which will allow them to keep their stakeholders informed about the actions taken and the results obtained to achieve sustainability and thus improve the image of their companies. The practice of this voluntary reporting will contribute to increase transparency and accountability of these companies and will also help the internationalization of their markets. In this sense, the framework for the evaluation of sustainable performance proposed in this work will allow Peruvian manufacturing SMEs in the plastics sector to be prepared for when they decide to implement the GRI sustainability report, since the indicators chosen are aligned with the GRI standards.

## 7.2. Conclusions

The aim of this study was to develop a holistic performance assessment framework that enables Peruvian manufacturing SMEs to evaluate the full integration of the three aspects of sustainability into their business strategy and the creation of value for each stakeholder.

To achieve the general objective set forth, the present study was carried out in two stages: firstly, a literature review was performed, and based on the gaps found, a conceptual assessment framework was designed. Secondly, a multiple-case study was conducted in three Peruvian SMEs, and the data obtained were used to deploy the conceptual assessment framework.

As a result of this work, we have proposed the “SMEs’ Sustainable Balanced Scorecard” (SMESBSC), a specific SBSC that integrates the three pillars of sustainability performance within four different perspectives, namely Sustainability perspective (instead of the traditional “Financial perspective”), External Stakeholders perspective (instead of the “Customer perspective”), Internal business processes perspective, and Learning and Growth perspective.

Departing from previous literature, this study adds evidence to that the integration of sustainability into corporate strategies has not yet been fully resolved, especially in emergent economies [5]. To that relatively few methodologies and tools are applied in the manufacturing environment and that they lack a holistic approach to sustainability [18]. And to that, neither controlling practice nor sustainability are routine and commonplace but rather differ significantly at the company size [81,82], and controllers are more involved in short-term operational tasks and functions than in long-term strategic issues [83], especially in SMEs.

The main difference of the present research with previous literature is that through this research, we are giving a new approach to SBSC that can replace the currently most used hierarchical architecture, about 70% of the SBSC architectures in the literature are based on this hierarchical structure [84], where all organizational goals are aligned towards profits contradicting the Stakeholder Theory [31,33,62–68], by a sustainability assessment

framework with a semi-hierarchical architecture that shows all stakeholders relationships explicitly and with a flat top perspective where no single goal predominates, satisfying economic, social, and environmental goals at the same time, considering the importance of meeting all stakeholders' requirements and expectations; unveiling a new SBSC approach that will allow to expand the frontiers of knowledge regarding the design of MCSs that really allow the successful implementation of corporate sustainability strategy. This is the theoretical contribution of this research.

From a managerial point of view, we are contributing with Peruvian manufacturing SMEs in the plastic sector giving them a structured methodological framework to assess how they are managing the sustainability of their operations based on suitable key performance indicators, which will make possible to address and correct the deficiencies in sustainable management found in those companies. In this sense, it should be mentioned that most of the conceptual assessment frameworks proposed so far in the literature reviewed are not detailed enough, which would be of little help from a practical point of view to managers to implement them in the daily management of their companies. This is why, as a complement to the conceptual framework proposed in this study, we are including its detailed deployment by setting out concrete strategic objectives showing their linkages in a Strategy Map and proposing a set of indicators that will serve to monitor compliance with the proposed strategic objectives and for future sustainability reporting, given the rising stakeholder demands for richer disclosure. In summary, the information provided by the proposed sustainability assessment framework will help managers of Peruvian manufacturing SMEs in the plastic sector to monitor compliance with environmental and social policies and regulation; to motivate continuous improvement; to provide data for internal decision making and to provide data for external reporting.

To validate all the benefits that the implementation of the proposed sustainability assessment framework will bring to Peruvian manufacturing SMEs in the plastic sector, we would like to mention the following three studies carried out in SMEs in other industrial sectors, in Malaysia, Austria, and Canada, which corroborate the fact that the use of non-financial measurement will experience the improvement in the performance of SMEs [85], that SBSC application is useful for SMEs and brings additional benefits by viewing sustainability management in terms of a holistic perspective [86] and that the visualization of linkages between social and environmental practices, value creation, and ultimate economic success helps managers to better understand how sustainability is an integral part of their business operations and economic performance and gain their support rather than opposition [33].

The limitations of the presented research study result from the small number of interviews on which the findings are based. However, it is important to highlight that this limitation is compensated by the fact that one of the interviews conducted gather the opinions of the highest representative of the Peruvian plastics industry guild, which strengthen and validate the results of the study. Even so, the results cannot be generalized, and further research is recommended to deepen the present findings on other types of organizations or industries, as well.

Finally, it should be mentioned that according to the literature [87], research on SBSC can be structured into the following three areas: design of SBSC, implementation and use of SBSC, and evolution of SBSC. In that sense, this research opens the door for future studies that may demonstrate the benefits of applying the proposed framework at the implementation and use stage.

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## Appendix A

### Interview questions

1. Do you receive management control information (MCI)?
2. From which areas of your company do you receive MCI?
3. How do you receive the information?
4. Is the information you receive timely and reliable?
5. Do you use the MCI you receive for decision making?
6. What do you consider to be the Critical Success Factors for your company?
7. Are strategic objectives established in your company?
8. Are environmental and social aspects considered within your strategic objectives?
9. Could you mention which are the main Stakeholders of your company?
10. Within your strategic objectives, is the satisfaction of the stakeholders of the business considered?
11. Is there any legislation in force regarding the mandatory reporting of social and environmental aspects?
12. Are performance indicators used to measure the achievement of your strategic objectives?
13. What indicators do you currently use to measure economic aspects?
14. What indicators do you currently use to measure environmental and social aspects?
15. Do you use the Balanced Scorecard?
16. Why do you use it or don't you use it? What advantages or disadvantages do you find?
17. Would it be useful for your management to have a set of indicators that would allow you to monitor the achievement of all the Strategic Objectives?
18. In your opinion, in addition to knowing the results of each indicator individually, it would be useful to have only three composite indicators that can measure the overall result of each aspect (economic, social, environmental)?
19. In your opinion, it would be useful for your management, in addition to knowing individually the results of each indicator, to have only one composite indicator that can measure the overall result of the three aspects mentioned.
20. Does your company have any mandatory or voluntary sustainability reporting to any governmental or non-governmental organization?
21. Are you familiar with the Global Reporting Initiative (GRI Standards) sustainability reporting system?
22. Of the following STRATEGIC OBJECTIVES, please check whether they are considered in your Strategic Plan and if so, indicate their degree of importance on a scale from 1 (not very important) to 5 (extremely important). Also, if any strategic objective is not considered, please mention if you believe it should be considered and indicate its degree of importance:

ECONOMIC DIMENSION										
Strategic Objective	Considered?		DEGREE OF IMPORTANCE					Should you consider it?		Degree of importance
	YES	NO	1	2	3	4	5	YES	NO	
Reduce costs										
Increase sales revenues										
Increase Profitability										
Attract investment and financing										
Achieve sustainable growth										
Improve market share										
Increase sales volume										
Maximize customer satisfaction										
Increase new product offerings										
Optimize processes										
Increase productivity										
Improve quality										
Improve technological infrastructure										
Innovate processes and products										
ENVIRONMENTAL DIMENSION										
Strategic Objective	Considered?		DEGREE OF IMPORTANCE					Should you consider it?		Degree of importance
	YES	NO	1	2	3	4	5	YES	NO	
Efficient use of natural resources										
Use of clean technologies										
SOCIAL DIMENSION										
Strategic Objective	Considered?		DEGREE OF IMPORTANCE					Should you consider it?		Degree of importance
	YES	NO	1	2	3	4	5	YES	NO	
Implement OSH										
Recruit valuable people										
Train and motivate personnel										
Support local communities										
Improve company image										
Do you think any other strategic objective should be considered?										

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