Performance management systems for sustainability in SMEs: An interventionist approach

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Abstract

To address global sustainability, engagement from every social sector is necessary. In this context, businesses can play a pivotal role.

Therefore, it is urgent to establish proper management tools in order to support organizations' top management in addressing these goals. While larger firms are making progress in measuring, managing and reporting sustainability performance, small and medium enterprises (SMEs) are lagging behind for various reasons – such as the lack of regulatory frameworks, standards, managerial competence and more. In OECD countries, SMEs account for 40% of private sector GDP. As such, their relevance and role in pursuing sustainability cannot be overlooked.

This research aims to advance understanding of the development and implementation of performance measurement and management (PMM) systems taking into account the sustainability dimensions of performance in SMEs. This is key to allowing businesses and their management to measure and monitor their impact at the economic, social and environmental levels.

In order to do this, the research is based on action research and the incorporation of an interventionist approach. In particular, the authors have developed a sustainability PMM for a medium citrus company operating in the B-to-B market and based in Southern Italy.

Keywords: Sustainability, performance management and measurement, SMEs, interventionist approach, indicators.

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1. Introduction

Today, striving for success entails striving for sustainability, the imperative for the sole viable future. Sustainability is linked to the concept of sustainable development that "meets the needs of the present generation without compromising the ability of future generations to meet their needs" (UN, 1987). To address sustainability every social actor – including firms – must fully commit to the issue

Performance measurement and management (PMM), as a critical business practice for addressing sustainability, is thus called on to assess environmental, social, and economic dimensions of performance, integrating these aspects with sustainability reporting (Schaltegger & Wagner, 2006; Molinari et al., 2021; D'Onza, 2022; Olivotto, 2022; Santoni, 2023). Stemming from the longstanding awareness of the limited contributions from sustainability accounting research in affording the need to lead critical managerial paths (Burritt & Schaltegger, 2010) – particularly for small and medium enterprises (SMEs) (Mengistu & Panizzolo, 2022) – much of the literature had questioned "why" rather than "how" companies can address sustainability assessment through redesigning their traditional management control system (Maas et al., 2016; D'Onza, 2022).

Considering the significant impact of SMEs on the global economy (Acs, 1992; Ackermann, 2012), we argue that integrating accounting and reporting tools could support firms in becoming leaders in the transition towards sustainability (Schaltegger et al., 2016) especially considering the lack of suitable indicators tailored to SMEs' needs (Mengistu & Panizzolo, 2022). Notably, while larger firms already started the process of integrating sustainability indicators in their information systems and management tools, SMEs are lagging behind (Garengo & Bernardi, 2007; Del Baldo, 2017; Barbosa et al., 2020).

To the best of the authors' knowledge, few researches have addressed the design and implementation of sustainability-PMM systems in SMEs (Nigri & Del Baldo, 2018; Hristov et al., 2019; Cavicchi et al., 2023; Mengistu & Panizzolo, 2022). Therefore, this article aims to address the following research questions:

RQ1: What are the needs of SMEs in the development of a sustainability-PMM system?

RQ2: How might SMEs develop PMM systems addressing sustainability?

RQ3: How to identify, develop and select the related performance indicators?

In order to tackle this aim, the authors carried out action research based on an interventionist approach (Jönsson & Lukka, 2006; Baard, 2010). In response to Merchan and Otley's call for the use of field research in management control studies, this research focuses on a small citrus company located in Southern Italy – i.e. Agrumaria Reggina Srl. Following the GRI perspective, as the most popular sustainability reporting framework (Ramos et al., 2013; Shields & Shelleman,

2015; Shields & Shelleman, 2017; Arena & Azzone, 2012), the study draws on parallels with its metrics.

To address the research objective, i.e. the design of a sustainability-PMM system, the authors developed an approach structured in four phases – i.e. i) literature review, ii) benchmarking analysis, iii) organization and process mapping, iv) definition of sustainability-PMM scorecard.

2. Theoretical background

As sustainability has become the key objective for every social system and organization, in the last decades, accounting literature has been dealing with the necessity of "accounting for sustainability" (Bebbington & Gray, 2001). However, most of this literature has focussed on reporting and disclosure rather than on management accounting (D'Onza, 2022; Della Porta et al., 2023).

Although sustainability reports are powerful tools in interacting with stakeholders and inform top managers, management accounting tools, such as PMM systems may be of greater support to timely and comprehensively inform decision-making processes. PMM systems include those control mechanisms that guide an organization or a system toward the achievement of objectives and targets that deliver on its mission and strategy (Simons, 1994; Lebas, 1995; Ferreira and Otley, 2009; Riccaboni, 2009). If we define performance measurement as the activity of collecting data, defining indicators and computing such indicators to evaluate the ability of a certain entity to achieve strategic goals (Eccles, 1991; Hudson et al., 2001), performance management is instead focused on the utilisation of such information in decision-making processes (Ferreira and Otley, 2009; Bititci et al., 2012).

According to Barbosa *et al.* (2020), traditional PMM systems are designed to address financial and competitive goals of firms, neglecting the importance of environmental and social issues as well as their interrelationships with sustainability control systems.

Literature thus suggests the re-design of PMM so as to integrate the sustainability imperative (Barbosa et al., 2020; Castellano & Felden, 2021; Zharfpeykan & Akroyd, 2022; Dal Maso & Lattanzi, 2022). One critical aspect in doing this revolves around the decision of whether to view this integration as a revolutionary change, involving the creation of entirely new PMM systems, or as an evolutionary change, where existing PMM systems are adapted through the incorporation of new metrics. Ghosh et al. (2019) suggest that organizations tend to lean towards the latter option. However, it's important to note that this approach does not guarantee that the business strategy effectively incorporates sustainability

considerations, as pointed out by Beusch et al. (2022).

With regard to this issue, large corporations have taken the initiative, while SMEs lag behind due to issues such as subpar accounting practices, managerial limitations, and financial constraints, (Hsu et al., 2017, Barbosa et al., 2020). As such, despite literature highlighting a growing interest in the field of sustainability for SMEs (Manzaneque-Lizano *et al.*, 2019; Della Porta et al., 2023), these still strain to improve strategic planning and performance management measurement tools (Garengo & Bernardi, 2007).

A significant challenge SMEs should face when designing sustainability-PMM systems, is that sustainability indicators were initially developed with large firms in mind, thus often reflecting their organizational needs (Reynolds & Yuthas, 2008). Factors such as company size, industry, and managers' beliefs regarding sustainability needs are closely linked to the incorporation of sustainability indicators into a business's PMM system, (Zharfpeykan & Akroyd, 2022). Moreover, information systems of larger firms are usually better developed than those of SMEs, meaning that some performance indicators cannot be easily computed by smaller firms. Nonetheless, these indicators play a referral role, particularly for SMEs, who are urged to transition from adhering to minimal standard measures, to creating robust performance indicators that inform business strategies and assist decision-makers in the pursuit of competition. (Azzone et al., 1997; Hsu et al., 2017; Trianni et al., 2019; Barbosa et al., 2020; D'Onza, 2022). From this perspective, performance indicators are useful tools that can assist managers in making more sustainable decisions, influencing actors and coordinating their work toward common objectives (Cavicchi et al., 2023; Mengistu & Panizzolo, 2022).

How to design PMM indicators and systems in SMEs is still an ongoing debate (Hristov et al., 2019; Mengistu & Panizzolo, 2022). This article aims to provide a contribution to this issue at both the theoretical and practical level.

3. Research method

The adoption of an interventionist approach aims to address the research topic at both the theoretical and practical level (Dumay, 2010; Barretta & Noto, 2023).

Merchant and Otley (2020, p.1) call for "more field-based studies by academics who are better connected with the world of practice" and recognize that this kind of research "it is more likely to produce relevant and valuable theories and insights than work conducted at arm's length from an academic office".

Thus, these authors suggest the adoption of case studies, field experiments,

and action research (or interventionist research). In accordance with this suggestion, this article develops action research aimed at designing and developing a sustainability-PMM system for an Italian SME.

The project started in January 2023 and focused on a citrus company located in Southern Italy, Agrumaria Reggina Srl. In particular, this is a family-run company operating in the B-B market.

To address the research questions developed in the introduction, i.e. the design of sustainability-PMM systems for SMEs, the authors developed an approach structured in four phases.

First, a literature review was conducted in order to identify the key theoretical frameworks and methodologies adopted by the existing literature that focuses on PM, indicators, and sustainability in SMEs. This phase enabled us to design the state of the art of the context under our examination

The second phase consisted of empirical analysis through classification of practices in SMEs of similar size operating in the same industrial sector as the analysed case; these were selected from the AIDA database® (Bureau van Dijk). The aim of this phase was to develop a cluster of SMEs to benchmark with. This stage was directed at highlighting the recurrence of sustainability measurement practices among selected SMEs. We checked and summarized data, tracking qualitative and quantitative information about social and environmental measures adopted.

The third phase of our analysis involved engagement with Agrumaria Reggina Srl management through interviews and focus groups with the scope of understanding their organizational vision, mission, and business processes.

The fourth phase had the objective of drafting the firm's sustainability-PMM system. This activity was carried out also by comparing results with the GRI standards, i.e. the Sustainability Reporting Standards developed by the Global Sustainability Standards Board (GSSB). The GRI is a sustainability reporting system obliged to disclose - in a transparent manner - how an organisation contributes or wants to contribute to sustainable development. GRI Standards are based on protocols of intergovernmental bodies and are structured as an interconnected modular system organised in three series: the GRI Universal Standards that can be used by any organisation; GRI Sector Standards that are defined by business scope; GRI Topic Standards that are designed around specific "material topics", i.e. in relation to the organisation's impacts on the economy, the environment and people, including their human rights.

As a result, we obtained a sustainability-PMM system organized into dimensions and sub-dimensions each of those populated by a set of performance indicators.

4. Results

Results are organized according to the phases described above.

4.1. Phase 1: Literature review

According to a preliminary literature review conducted on scientific research focused on sustainability-PMM systems in SMEs, we found that, broadly speaking, the research has underexplored this topic (Buonasera et al., 2024). Most of the articles identified (Falle et al., 2016; Winroth et al., 2016; Hristov et al., 2019; Mengitsu & Panizzolo, 2022) rely on the triple bottom line to identify the key dimensions of PMM. Additionally, references to Sustainable Development Goals (SDGs) are often made. The Sustainable Development Goals consist of 17 interconnected targets, defined by the United Nations as a strategy "to achieve a better and more sustainable future for all". They are structured into 169 sub-targets that form the core of the 2030 Agenda (UN).

As such, we used the triple bottom line as a starting point to identify the key dimensions of the sustainability-PMM system of Agrumaria Reggina Srl, i.e. economic, social and environmental. However, in the development of the final dashboard of performance indicators, the economic dimension was not taken into account as this was already properly tackled by the existing PMM system used by the firm.

4.2. Phase 2: Benchmark analysis

The aim of this stage of the analysis is to identify a reference benchmark as a tool for creating a set of sustainability indicators which are tailored to the reality of the selected citrus company.

The selection process moved from the AIDA database®, searching for a cluster of similar companies - in terms of industry and size - to the reference company.

The query used to interrogate the system was formulated with the following rationale:

- ATECO Code: 1032 - Production of fruit and vegetable juices; 1039 - Other processing and preserving of fruit and vegetables;
- Legal status: Active;
- Sales revenue (EUR thousand): Last year available, min=2,000, max=50,000 (derived from the medium enterprise definition);
- Employees: Last year available, min=50, max=250 (derived from the medium enterprise definition).

This search strategy led to a selection of 70 companies, including the analysed one. The list of resulting companies was carefully screened in order to identify any documentation or information related to sustainability measurement on their websites.

The only documentation available regarding sustainability measurement emerging from this screening was the sustainability report. Notably, only 3 out of the 70 companies have published documents relating to their sustainability performance. For each of these companies, several data points were detected: the year of publication, the recurrence of certifications, the prevalence of quantitative or qualitative information and the presence of performance indicators and absolute measures.

The companies that produced a sustainability report (at 2021) are Fiordagosto, Damiano and Simone Gatto. These are based in the provinces of Salerno (Fiordagosto), and Messina (both Damiano and Simone Gatto).

Fiordagosto is a Limited Liability Company of the Mutti Group, which processes Italian tomatoes. Their sustainability report was prepared in accordance with the GRI-Referenced option as outlined by the Global Reporting Initiative's Sustainability Reporting Standards established in 2016. Specifically, in accordance with GRI Standard 101: Reporting Principles, paragraph 3, the disclosures were referred to: GRI 302: Energy 2016 (302-1); GRI 303: Water and water discharges 2018 (303-3; 303-4); GRI 305: Emissions 2016 (305-1, 305-2); and GRI 306: Water discharges and waste 2016 (306-2).

Damiano is a Benefit Corporation focusing on the production and processing of dried fruits. Their sustainability report was prepared according to the Benefit impact assessment (BIA) standard and the "B-CORP" certification criteria.

Simone Gatto is a Limited Liability Company operating in the citrus market (both B2B and B2C). Their sustainability report was developed according to the GRI standards.

From the analysis of their sustainability report, we identified and listed the key performance indicators (KPI) reported in Table 1.

The process of identifying and mapping KPIs from the benchmark enabled the researchers to develop an initial framework for what should be measured and considered relevant for firms operating in the same sector as Agrumaria Reggina Srl. This step served as both a draft of our dashboard of indicators and as a reference list of KPIs and targets for comparison. Specifically, the list of indicators resulted from combining various insights about the potential structure of the draft dashboard. First, by aligning the results from clustered firms, we were able to identify the key dimensions and sub-dimensions of environmental performance indicators—most of which focused on this area. Second, we established numerical standards for each indicator's targets, providing a benchmark to compare

against the results of Agrumaria Reggina Srl.

Table 1: The KPI used by the benchmark sample

Numerator	Denominator	Unit of measurement	Target	Notes
Energy Consumptions	Raw Material	GJ (Gigajoules)/ t (tons)	1,51	GRI Protocol Standard - GRI 302: Energy 2016 (302-1);
Energy Consumptions	Finished + Semi-finished product	GJ (Gigajoules)/ t (tons)	1,83	GRI Protocol Standard - GRI 302: Energy 2016 (302-1);
Water Withdrawals	Raw Material	lt(liters)/t(tons)	2,49	GRI Protocol Standard - GRI 303: Water and water discharges 2018 (303-3; 303-4)
Water Withdrawals	Finished + Semi-finished product	l(liters)/t(tons)	2,49	GRI Protocol Standard - GRI 303: Water and water discharges 2018 (303-3; 303-4)
Water discharges	Raw Material	l(liters)/t(tons)	2,05	GRI Protocol Standard - GRI 303: Water and water discharges 2018 (303-3; 303-4)
Water discharges	Finished + Semi-finished product	l(liters)/t(tons)	2,87	GRI Protocol Standard - GRI 303: Water and water discharges 2018 (303-3; 303-4)
Recovered and recycled waste	Total waste (excluding sewage sludge)	t(tons)/t(tons)	72%	GRI Protocol Standard - GRI 306: Waste and water discharges 2016 (306- 2)
Processed Goods	Water discharges	kg(kilograms)/m2(cubic meters)	+ 2,3%	B-Corp certification standard (minimum 80 pt. %) - Benefit Impact Assessment (104,6 pt)
Processed goods	Energy Consumptions	kWh (kilowatt hours)/kg(kilograms)	+ 2,48%	B-Corp certification standard (minimum 80 pt. %) - Benefit Impact Assessment (104,6 pt)
Plastic and cardboard waste	Processed Goods	kg(kilograms)/t(tons)	- 5,2%	B-Corp certification standard (minimum 80 pt. %) - Benefit Impact Assessment (104,6 pt)

Source: elaboration by the authors on the basis of the cited reports.

4.3. Phase 3: Organization process mapping

Starting with a preliminary study of the Agrumaria Reggina Srl organizational chart, two top managers were interviewed (for a total number of four interviews): the Chief Financial Officer (CFO) – to gather information related to corporate governance – and the Chief Operating Officer (COO) – to study the business's production and transformation processes.

The interviews with the CFO were aimed at understanding the vision and mission of the firm, as well as the business development perspective and the relationship with key stakeholders.

These interviews highlighted the company's efforts to promote gender equality at every organisational level (including top management). Moreover, it is critical for the activity to build trust in relationships with both suppliers and customers. Lastly, although the company has not yet begun to produce any sustainability reporting document, their target is to develop such an activity in the near ne future.

The interview with the COO was focused on understanding the processes of production, product processing and transformation. The contents, after a brief preliminary description of the Research Project by the Researchers, were drawn from the following questions proposed to the interviewee:

- description of the company's main production processes (by product lines)
- identification of the most important information flows relating to the company's production processes
- indication of the information gathered for quality certification
- use of quality/process indicators for internal (i.e. rewarding) or external (i.e. reporting to others) purposes
- possible opportunities to collect further information flows
- suggestions for new indicators that might be appropriate for the purposes of monitoring production processes.

According to the interview, the company's plant operates in line with the seasonality of beverage consumption and the seasonality of the production of fruit. The activity starts in November and ends around May, consisting essentially of the processing of oranges, lemons and mandarins.

The processing stage was described as consisting of peeling, squeezing, and pressing, re resulting in the production of both the first-press juice and a second-press juice. The refining stage is carried out through enzymatic and mechanical processes, using decanters and centrifuges, from which the raw material, stored in cold rooms, is supplemented with other similar raw materials. The blending

process requires daily operation in 3 shifts, operating on customer demands. The storage profile varies according to the type of product being stored, requiring the use of refrigerated cells for juices, or simple dry storage for products such as oils or flavourings.

For each phase of the production process, the interviewee was asked to reflect on the key aspects and information flows related to sustainability issues.

The COO highlighted that information and flows primarily concern customers' orders, material requirements, 'blending', stock management as well as shipments. Most of the production data is collected to address quality certification informative needs.

Other information and data needs – in connection with sustainability measurement – that emerged during the interviews are related to the analysis of the fruit supply chain. Although some data is already collected in this sense for certification (e.g. Halal), other social and environmental information may also be required.

Table 2 summarizes the process phases, and the key issues related to sustainability measurement.

Table 2: Production process map and key issues related to sustainability

Phase	**Key aspects/issues**	**Data and information to be gathered/analysed**
Production and purchase of fruit	Relationship with suppliers	Information flows about suppliers (e.g. nationality, CSR practices, etc.)
Processing of raw materials	Energy consumption, water and waste	Separate indication of renewable/non-renewable sources renewables; destination of water flows; and waste for recycling
Refining semi-finished products	Relationship with suppliers	Separate indication of goods in consignment processing
Blending	Energy consumption, water and waste	Separate indication of renewable/non-renewable sources renewables; destination of water flows; and waste for recycling
Storage	Energy consumption	Scheduled energy consumption plan
Shipping	Transport GHG emission	Separate indication by category of used vehicles

Source: authors own elaboration.

Regarding the environmental issue, the company also pays attention to energy consumption in the production of outputs, as well as in the use of water resources. The interest in using (and measuring) renewable sources is being addressed through the reuse of the sub-processing (pulp) product to produce energy and to reduce related costs. The packaging aspect is of little relevance in the analysed case due to the company's primary use of containers such as tanks and metal drums. However, the profile of emissions related to the national transport of goods was highlighted suggesting that the energy profile of the road vehicles currently used (mainly euro 6 and euro 5 class) could be reconsidered. In contrast, international transport involves the use of containers.

4.4. Phase 4: Definition and classification of performance indicators

The fourth, and final phase of the project started with analysis of the data and information collected, in order to design and develop the PMM dashboard and sustainability performance indicators.

In line with the findings reported in the literature analysis in phase 1 and the results obtained in phase 2, we developed a sustainability-PMM organized in two key dimensions, the environmental and the social (as previously stated, the economic one has not been developed as already included in the current PMM system adopted by the company).

Every dimension is structured in sub-dimensions, each populated by a set of indicators. The sub-dimensions of the Environmental dimension are "Energy", "Water" and "Waste"; while the sub-dimensions of the Social dimension are "Employment" and "Supplier".

The indicators selected for each sub-dimension were compared to the GRI standards (2023). This comparison allowed us to better define some of the developed indicators and to add new relevant indicators to some of the sub-dimensions identified. Overall, the final set of indicators was composed of 16 performance measures.

Each indicator was defined according to a specification sheet including ID, name, dimensions, sub-dimension, data source, unit of measure, target, notes (e.g. whether referred to a standard or other source), and SDG.

Below, we provide two specification sheet examples – one for each investigated dimension – of performance indicators: Indicator A1-A – Energy efficiency; and Indicator S1-D – Glass Ceiling Index.

Indicator A1-A: Energy efficiency

The area of energy efficiency is connected to GHG emissions, one of the most relevant GRI material topics. This takes into account emissions of greenhouse

gases divided into three subarea scopes, direct, indirect and upstream and downstream of the firm's activity.

Greenhouse gas (GHG) emissions include emissions into the atmosphere that have an impact on climate change, such as carbon dioxide (CO_2) and methane (CH_4). The activities of the oil and gas sector and the use of their products are the main contributors to most greenhouse gas emissions. In particular, the tailored indicator can be declined to express the organisation's internal and external energy consumption, as well as consider activities discriminated as belonging to upstream or downstream processes of the organisation. The reporting sheet can be selected by organisation, business unit, process/product, or type of energy source.

Table 3 displays the specification sheet of the performance indicator A1-A.

Table 3: Energy efficiency KPI specification sheet

ID	A1-A
Indicator name	Energy Efficiency
Dimension	Environmental
Sub-dimension	Energy
Numerator	Energy consumption
Denominator	Raw material
Data source	Company information system
Unit of measurement	GJ (Gigajoules)/ t (tons)
Target	Benchmark
Notes	Protocol Standard - GRI 302: Energy 2016 (302-1);
SDG	12 & 13

Source: authors' own elaboration.

As evidenced in table 3, the indicator is based on that which was used by one of the benchmark companies identified in Phase 2. The target is linked to this reference, even though during the discussion with the CFO, the possibility of adopting an internal target (i.e. the historical trend),based on the value of the first collection of data, was spoken about. The indicator is consistent with the standard

GRI 302 and is moreover, linked to two SDGs, namely "Responsible consumption and production" (12) and "Climate action" (13).

Indicator S1-D: Glass Ceiling Index

The area concerning the social dimension takes into account the impact of the company in terms of employment and suppliers.

One of the adopted indicators is the Glass Ceiling Index (GCI). This indicator, suggested by the European Union and consistent with various research studies aims to measure and address a key governance aspect outlined by the CFO, namely gender equality at the top management level. This index compares the proportion of women in the company with the proportion of women in top management positions in a given year. The GCI can range from 0 to infinity. A GCI of 1 indicates that there is no difference between women and men in terms of probability of promotion, while a score of less than 1 signifies that women are more represented in top management positions. Generally, the higher the value of the index, the stronger the glass ceiling effect and the more difficult it is for women to move into a higher position (European Commission, 2019).

Table 4 displays the specification sheet of the S1-D performance indicator.

Table 4: Glass Ceiling Index KPI specification sheet

ID	S1-D
Indicator name	Glass Ceiling Index
Dimension	Social
Sub-dimension	Employees
Numerator	% women among non-managerial figures
Denominator	% women among top management figures
Data source	Company information system
Unit of measurement	Unitless
Target	1
Notes	European Commission (2019); GRI Disclosure 405: Diversity and equal opportunities (2016)
SDG	5

Source: authors' own elaboration.

Table 4 shows the value of 1 as a target for the CGI (i.e. no difference between women and men being promoted). The reference can be found both at the European Level (2019) and with regard to the GRI standard 405. From an SDG perspective, the indicator can be linked to Goal 5 "Gender equality".

The complete list of indicators of the sustainability-PMM of Agrumaria Reggina Srl is reported in Annex 1 (www.sidrea.it/performance-sustainability-SMEs).

5. Discussion and conclusion

As a vital part of contemporary society in Western countries, SMEs, as well as all other social actors,are expected contribute to sustainable development.. However, unlike big corporations, they lag behind in the adoption of management tools to address this issue (Del Baldo, 2017; Della Porta et al., 2023; Barbosa et al., 2020). This is due to several factors including their size, - in terms of number of employees and skills, the lack of adequate information systems, and their heterogeneity in terms of goals, organizational activities and structure, which make the adoption of accounting standards and general tools less suitable.

Despite these challenges, the literature highlights the importance for every SME of implementing sustainability accounting tools such as reporting and PMM. Thus, this article aims to provide an approach for developing a tailor-made sustainability-PMM system for an Italian SME.

Answering the first research question – what are the needs of SMEs in the development of a sustainability-PMM system? – the research conducted outlined that top managers of SMEs must deal with different requirements stemming from norms, rules, social pressures, and quality standards. In order to meet these requirements, they need to rely on a PMM system that allows them to both report sustainability results to stakeholders (Schaltegger & Wagner, 2006) and to inform decision-making processes accordingly (Cavicchi et al., 2023; Mengistu & Panizzolo, 2022). In the analysed case, the existing PMM system was primarily focused on measuring financial performance, thus limiting its ability to meet the information needs of certain stakeholder groups. The design of the sustainability-PMM system allowed the top management of Agrumaria Reggina Srl to identify the missing information required to address these external pressures.

With regards to the second research question –. how might SMEs develop PMM systems addressing sustainability? – the adoption of an interventionist method was instrumental in developing an approach that could c be easily incorporated by every SME. This is structured in four phases. The first step involves conducting a literature review to understand the research's findings and suggestions in relation to the topic. This phase was useful in suggesting the development of a PMM structure relying on the triple bottom line and linked to SDGs. The second phase relates to the identification of a benchmark of firms selected according to size (medium enterprises in our case) and activities. Benchmarking is

a practice of comparison with other organizations aimed at improving practices in terms of efficiency and effectiveness (Francis & Holloway, 2007). In our case, benchmarking allowed us to understand what kind of sustainability performance dimensions, measures and targets similar organizations, operating in the same sector, are using for reporting purposes. The third phase was aimed at exploring the organization's needs, goals and processes in order to understand what dimensions, sub-dimensions and indicators are relevant and should be prioritized for Agrumaria Reggina Srl. Lastly, in the fourth phase, the researchers performed a "*labor limae*" of the preliminary version of the sustainability-PMM by comparing the results with GRI standards. This activity was considered instrumental for utilizing the indicators, reporting purposes and enabling the future comparability of results with other entities. The final sustainability-PMM of Agrumaria Reggina Srl was then discussed in a focus group with the firm's top management.

The third research question focused on the criteria to identify, develop and select the performance indicators populating the dashboard. These have been identified based on both the benchmark analysis and the interviews conducted with the top management representatives. Once identified, the set of indicators was compared with GRI standards so as to improve their formulation and select the most relevant ones. Lastly, the final focus group with the top management was key to discussing the computation feasibility.

At the theoretical level, our research adds evidence and contributes to the literature on sustainability-PMM, or sustainability control systems in SMEs (Barbosa, et al., 2020; Cavicchi et al., 2023; Mengistu & Panizzolo, 2022; Della Porta et al., 2023; Buonasera et al., 2024). In particular, the research outlines the need to measure and report sustainability performance in SMEs, focusing on the design of PMM systems and on the selection of performance indicators. The authors developed the field research by leveraging the interventionist approach and limiting its potential bias through the literature comparison. The research highlights that in the context of SMEs, characterized by wide heterogeneity in governance, resources, and activities, benchmarking can be a valuable practice, not only for comparing processes and results but also for determining what to measure and how. The research also adds to theoretical evidence regarding the need of a revolutionary change in designing a sustainability-PMM system in SMEs (Ghosh et al., 2019), as the case analysed required the creation of an entirely new PMM system to address sustainability. This is due, according to the authors, to the scarcity of information flows related to the investigated phenomena – i.e. the environmental and social issues – characterizing SMEs.

While much of the literature on sustainability accounting focuses on reporting practices, this research provides evidence on the management accounting and control functions of the measures typically presented in sustainability reports. By

shifting attention from an ex-post (feedback) form of control to an ex-ante (feed-forward) approach, decision-makers can influence organizational behaviours towards measurable and achievable targets tailored to individual SMEs. In this way, sustainability-PMM not only drives the reporting process by supplying key stakeholders with relevant information, but also steers organizational processes towards predefined sustainability objectives. Integrating performance indicators into a cohesive measurement framework is the first step toward effectively utilizing this information for management purposes (Taticchi et al., 2010).

As in every interventionist research (Dumay, 2010), together with the *etic* (i.e., the theoretical domain), the article also contributes to the *emic* (i.e. the practical domain). In particular, at the practical level, the article explored "how" SMEs could tackle the need to measure, manage and report performance. The suggested method is articulated in four phases – i) literature review, ii) benchmarking analysis, iii) organization and process mapping, iv) definition of sustainability-PMM scorecard. This process is replicable and scalable as can be easily adapted to suit the needs of different kinds of firms.

The main limitation of this study is related to the adopted research methodology. Focusing on the experience of a single organization reduces the possibility of generalizing based on the findings. Moreover, the specificity of the industry to which this firm belongs – citrus products for the B2B market – may limit the generalizability of the results. Despite this, it is worth noting that the Italian market is predominantly composed of SMEs, which are increasingly expected to embrace CSR practices (Perrini et al., 2007), especially following the implementation of the CSRD mandate (Celli et al., 2024; Eriksson et al., 2024). In this context, it's important to highlight that the industry of Agrumaria Reggina Srl, which encompasses the production, processing, and preservation of fruit and vegetables across various stages of manufacturing, could serve as a promising model for future research. This could include exploring different sectors or other phases of the supply chain, such as distribution or the B2C market.

Last, the research is focused on the design and does not consider the implementation phase which may provide interesting feedback on how to develop a sustainability-PMM system for SMEs. As such future research may investigate the implementation of such systems and their effectiveness in supporting decision-making and reporting in SMEs.

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