

Sustainability strategy, tools and PMS in agri-food business: a case study from Italy

Vincenzo Riso^{1,*+}, Silvia Cantele¹,

¹Department of Management, University of Verona, Italy

[*vincenzo.riso@univr.it](mailto:vincenzo.riso@univr.it)

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Abstract

The agri-food sector is rapidly evolving towards sustainability due to public policies and market expectations. Companies impact the environment and society across the value chain, and the management of these impacts requires consistent tools. Among these are performance measurement systems that include sustainability-related indicators. This study examines the case of a sustainable agri-food company, focusing on its strategic monitoring of environmental, social, and economic dimensions related to its transition toward a more sustainable business model.

1. Introduction

The agri-food sector is profoundly evolving, given the international and national policies to make the sector more sustainable (Notarnicola et al., 2012; Vermunt et al., 2020). The impacts of companies in the sector are relevant from both an environmental and social point of view, extending across the entire value chain from agriculture to trade (El Bilali, Strassner and Ben Hassen, 2021; Barth et al., 2021). The literature has given great attention to environmental practices such as land consumption, responsible consumption of resources, and waste management (Jirapornvaree, Suppadit and Kumar, 2021). Less

attention has been paid to social practices, such as human resource management, supplier management, and community relationships (Lafont-Torio, Calderon-Monge and Ribeiro-Soriano, 2023).

Some studies have highlighted that firms need to adopt a performance measurement system (PMS) (Montemari, Chiucchi, and Nielsen, 2019; Montemari and Chiucchi, 2017) to assess the impacts of the practices adopted within the business model. In the agri-food sector, the focus on PMS has highlighted the importance of evaluating performance from a value chain perspective (Dania, Xing and Amer, 2018; de Carvalho, Relvas and Barbosa-Póvoa, 2022). However, while the definition of key performance indicators (KPIs) relating to financial dynamics has been widely explored (Hoque, 2014), the definition of sustainability KPIs linked to the company's business model has been neglected in the literature (Montemari, Chiucchi and Nielsen, 2019; Nielsen, Lund and Thomsen, 2017). Furthermore, for non-financial disclosure purposes (i.e., for GRI Standards with materiality assessment), impact indicators are also required (Perera-Aldama, 2023). Recently, Dembek et al. (2022) clarified the difference between outputs, outcomes and impacts, offering insights for defining KPIs. Given the importance of sustainable innovation in the business models of the agri-food sector and in monitoring the sustainability performance linked to the business model, this study aims to fill this gap by proposing an in-depth longitudinal case study (Yin, 2012) of a company operating in the agri-food processing, producing flours and oils. The company analyzed is a benefit corporation oriented towards sustainability for bylaws. It has been publishing the sustainability report for some time, and in 2022, it drew up its first sustainability plan, communicating to stakeholders the objectives and KPIs identified for monitoring with a forward-looking logic.

The choice to analyze this company followed the principles of purposeful sampling (Suri, 2011). Drawing on a qualitative approach, this study considers primary (open interviews) and secondary sources (sustainability reports and website disclosure). The preliminary results show how the company gradually introduced tools for sustainability strategy implementation and how PMS evolved correspondently. The article continues with a description of the methodology, the results, and, finally, with the discussion and final remarks.

2. Sustainability in agri-food sector and business model innovation

Traditionally, business models in the agri-food industry have been characterized by linear and often fragmented value chains, where the primary focus was maximizing productivity, minimizing costs, and achieving economies of scale (Ulvenblad et al., 2019). This conventional approach prioritized short-term financial gains over long-term sustainability, leading to adverse environmental and social impacts such as deforestation, soil degradation, and labor exploitation (Ulvenblad et al., 2019).

Recently, the paradigm has shifted towards more sustainable business models (SBMs) within the agri-food industry, driven by growing awareness of environmental degradation, climate change, and social inequality (Dentoni et al., 2021). In this context SBMs prioritize the triple bottom line of people, planet, and profit, aiming to achieve economic success while minimizing negative environmental and social externalities (Høgevold et al., 2015). As discussed by Perotti et al. (2024) SBMs adopt circular economy principles, aiming to reduce waste, maximize resource efficiency, and promote closed-loop systems. This involves recycling, upcycling, and product stewardship throughout the value chain. Moreover, several companies emphasize regenerative agriculture practices that restore soil health, enhance biodiversity, and sequester carbon (Swaffield et al., 2019). This includes cover cropping, crop rotation, and agroforestry, which improve soil fertility, water retention, and ecosystem resilience (Swaffield et al., 2019). If, on the one hand, the SBMs consider environmental issues as priorities, social issues are also considered. For example, some companies prioritize ethical sourcing and fair trade practices, ensuring that agri-food products are produced under conditions that respect human rights, labor rights, and animal welfare (Su et al., 2022). To demonstrate the correctness of their activities, many companies have their products and processes certified, as certifications are increasingly requested among the various players in the value chain (Bonisoli et al., 2019).

As Lehtinen (2017) discussed, transparency and traceability enable consumers to make informed choices about food products' origin, production methods, and environmental footprint. According to Galli et al. (2020), policymakers' intervention is crucial to increasing consumer awareness of the benefits of preferring sustainable products through incentives and educational and awareness campaigns.

Some studies have analyzed the evolution of business models towards sustainability through the Business Model Frameworks, the Business Model Canvas and other frameworks (Tell et al., 2016). Furthermore, some authors have carried out analyzes using more sophisticated frameworks. For example, Cantele and Signori (2023) analyzed the dairy sector through the application of the SVEM and the value triangle by Kleine and Hauff (2009) and LüdekeFreund et al. (2018) while Cavicchi and Vagnoni (2022) analyzed the evolution of the business model from a circular economy perspective in the wine sector through Ecocanvas by Daou et al. (2020).

3. Performance Measurement System for sustainability

As well known in the literature, Performance Measurement Systems (PMS) are essential tools for organizations to evaluate their effectiveness in achieving strategic objectives and managing resources efficiently (Hoque, 2004). With increasing emphasis on sustainability, organizations are integrating environmental, social, and economic performance indicators into their PMS to assess their impact on sustainability goals. PMSs encompass tools, methodologies, and metrics to evaluate organizational performance across various financial, operational, and strategic dimensions (Hussain et al., 2018). Traditional PMS

typically focuses on financial metrics such as profitability, return on investment, and market share. However, the evolving business landscape and stakeholder expectations have prompted organizations to adopt more holistic approaches incorporating non-financial indicators, including those related to sustainability (Silva et al., 2019; Jacket et al., 2023). In particular, sustainability has emerged as a critical consideration in PMS due to the growing recognition of the interconnectedness between business operations and environmental, social, and economic systems (Searcy, 2012). Sustainable PMS enables organizations to assess their contributions to sustainable development goals, track progress over time, and identify areas for improvement. By integrating sustainability metrics into their PMS, organizations can align their performance measurement practices with their broader sustainability objectives and demonstrate accountability to stakeholders (Searcy, 2012). Some studies have been developed to guide organizations in integrating sustainability into their performance measurement systems. According to Hussain et al. (2018), in most cases, the evaluation of organizational performance follows the Triple-Bottom-Line dimensions: economic, social, and environmental.

Another commonly used framework is the Global Reporting Initiative (GRI) Standards, which provide guidelines for sustainability reporting using standardized indicators. The GRI Standards cover various sustainability topics, including environmental management, labor practices, human rights, and community engagement (Adams et al., 2014).

Despite the benefits of integrating sustainability into performance measurement systems, organizations face several challenges in implementation (Bititci et al., 2012; Qorri et al., 2018). The first is the availability and reliability of data, particularly for non-financial indicators related to sustainability. Collecting and verifying sustainability data can be complex and resource-intensive, requiring investments in data collection systems, stakeholder engagement, and capacity building (Büyüközkan and Karabulut, 2018). Moreover, another aspect is the lack of alignment between sustainability objectives and organizational strategy. Organizations may struggle to identify relevant sustainability metrics that align with their strategic goals and objectives. Additionally, competing priorities and trade-offs between sustainability and financial performance may require organizations to balance short-term profitability with long-term sustainability considerations (Morioka and De Carvalho, 2016).

Finally, as discussed by Montemari et al. (2019) few studies have investigated how to link the business model to the performance monitoring system to verify the strategy implemented by the BM over time.

Given the few studies developed on the PMS to support strategy monitoring in SBM, the following research question is proposed:

RQ1: How do Performance Measurement Systems evolve to follow the sustainability path and tool adoption in an exemplary agri-food business?

4. Methodology and case study presentation

The study is based on a longitudinal case study analysis (Yin, 2012) spanning the period 2017-2024. Through open interviews, we proceeded to investigate the evolution of sustainability tools adoption and the performance measurement system to support the underlying strategy. The analyzed company is a family business, among the Italian leaders in transforming raw materials into flour and oil, having farmers among its leading suppliers. The company has over 400 employees and operates mainly in northern Italy, with a very close relationship with local farmers. The agricultural context, which represents the primary source of company supply, is characterised by a pluralism of farmers with small plots of land, a typical feature of the Italian territory.

The open interviews involved a member of the Board of Directors (BoDM) directly engaged in the sustainable transition: the figure identified by the company to carry out this activity is also a member of the owning family.

Furthermore, the interviews also involved some people in the management, particularly an agronomist responsible for maintaining relations with the supplier farmers (SCM, supply Chain Manager) and trading managers (TM) with in-depth knowledge of the markets.

The interviews were recorded and transcribed for subsequent analysis, according to Krippendorff (2011).

In addition to the interviews, several company documents were analyzed: in particular, four editions of sustainability reports from 2017 to 2023, the impact report drawn up as a benefit corporation, website pages dedicated to corporate sustainability activities as well as internal documentation such as the first sustainability plan and company bylaw with the clarification of the 'common good' aims.

The analysis was developed through an iterative process (Gioia et al., 2013) to identify the main steps in the corporate sustainability path, observing how the PMS evolved, adapted to and supported the decision-making process.

5. First insights on the evolution of sustainability strategy, tools and PMS

Data collected through interviews showed how the company's sustainability path actually began in 2012, driven by the agri-food market opportunities. In those years, the market required some specific sustainability certifications to produce fuels with sources of vegetal origin, including procuring resources from several suppliers, mainly in the local area. As asserted by the SCM, that moment represented a turning point for the company's sustainable transition by extending what had been done for a market request to the company strategy: *"We had already done a part on bioliquids, biofuels and so we said: but why not propose the same thing in the food processing sector given the effort we are already*

making? We are already doing important work on the farmers, so why not propose it to the food processing suppliers?" (SCM).

At that moment, the company needed to map numerous data points as the farmers in the area were mainly small farmers with relatively small plots of land. The number of data to collect and manage was very high. To manage the enormous amount of data efficiently, the company had equipped itself with specific software, providing farmers with an app for sharing all the data and training them on its use. As reported by the BoDM, the company perceived the importance of knowing how to manage data and collect information for the creation of KPIs for sustainability: *"We started to collect traceability and sustainability information: we asked farmers about where you grew, what yields you had, how many fertilizers you used, how much water you used, which seeds you have done to obtain a database that allows a Life Cycle Assessment and to measure an impact in terms of sustainability"* (BoDM).

The path towards sustainability, although beginning from a market opportunity, was inspired by the values of the family business; the BoDM says: *"The company is a family business and a family in business: therefore, we consider ourselves with this double meaning. Values are key for us (...): humility, passion and responsibility (...) Responsibility because we support millions and millions of people indirectly, we end up on the plates of millions and millions of people; we guarantee to supply thousands of companies and millions of consumers who would otherwise find themselves without a full plate in the evening, at lunch or at breakfast, therefore a strong sense of responsibility for that reason"* (BoDM).

As the interviews show, the KPIs supporting the sustainability strategy are a crucial element of the business model innovation path, to avoid decoupling between the actual practices and the monitoring systems.

The company continued to integrate sustainability practices into its strategy and, in 2014, launched a project for the first sustainability report using GRI standards. Among the reasons why the company decided to produce the sustainability report is the increasing demand for non-financial information from some stakeholder categories, especially from the financial world (banks and insurance companies). With the first sustainability report, the PMS evolves further and becomes more sophisticated with indicators referring to the GRI standard: as stated by the BoDM, this process has triggered a change in organizational culture to engage data owners in the data collection process, training them on the importance of monitoring and collect certain information and data.

From the drafting of the first sustainability report, the company developed the idea of transforming itself into a benefit corporation, clearly identifying a dual purpose 'for profit, for benefit': *"Our purpose is to guarantee nourishment and well-being for people, animals and environment to keep the ecosystem in perfect balance"* (BoDM). The company started drafting the impact report required for benefit corporations in Italy. It measured its impact on the 4 areas (governance, environment, workers, and other stakeholders) indicated by the regulation. Italian legislation does not clarify whether the impact report must be included in the sustainability report, so the company has decided to produce a separate

document with only the information required by the legislation: results of the previous year, assessment of impacts generated and objectives pursued for the following year. To prepare the impact report, the company had to extend the PMS activity to impact assessment through a standard developed by an independent third party (as required by law).

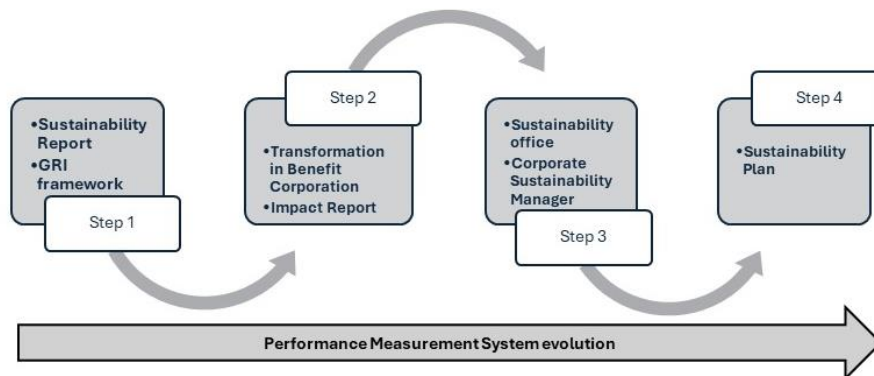
Furthermore, in 2020, the company created a dedicated sustainability office with a Corporate Sustainability Manager at its head. This step marks a further evolution in the PMS because it harmonizes the information flow relating to sustainability management, integrating it more into the corporate strategy with better governance: *"The sustainability office was born from the agronomic department in 2012, evolves in 2020 entering within the communications and marketing, soon after detaches itself from the communications and marketing office, now directed by our Corporate sustainability manager"* (BoDM).

Finally, in 2021 the company prepared the first three-year sustainability plan. The plan is another turning point for the company, which changed its PMS by introducing clear and defined prospective targets and KPIs for monitoring. As the BoDM clearly explains: *"at some point we realised that the sustainability assessment only represents what we have done, but we don't have a benchmark to measure us. Since then, we have made a sustainability business plan". So, the targets to be achieved are clearly identified in the plan, supported by KPIs for monitoring performance: "The sustainability plan is a fluid and dynamic element, adaptable, changeable, just as a classic business plan of a company is. We work with agriculture and climate change. We see it every day, more than others, precisely because we interact with the environment. The family's desire is precisely to safeguard the planet, and therefore the sustainability approach is a derivative of this philosophy, this strategy. The sustainability plan serves to have a trace, to have a route"* (BoDM).

The sustainability plan is not a public document; some plan targets are published on the company website for all stakeholders.

Figure 1 summarizes the path that led to the evolution of the company's adoption of sustainability tools, divided into five main steps: the introduction of sustainable supply chain monitoring, the first sustainability report, the benefit corporation transformation, the establishment of the sustainability office in the organizational chart, and the drafting of the first sustainability plan.

Figure 1 – Evolution of sustainability tools adoption and performance measurement system



Source: our elaboration

6. Discussion and conclusions

The analyzed case highlights how the PMS can support the evolution of a sustainability strategy through the introduction of different sustainability tools.

The sustainable transition in the case initially occurred due to market opportunities, but the company then exploited them to change direction according to the corporate values guarded by family business management.

Collecting numerous data for calculating the LCA was the first input for integrating the firm's performance measurement system with a system oriented towards measuring sustainability in the supply chain.

Later, the first sustainability report was produced through the GRI framework, offering new sustainability performance indicators (Adams et al., 2014).

The analysis of the sustainability reports shows that the company is committed to measuring and externally communicating the TBL performance (Searcy, 2012).

But the following evolution in PMS demonstrates the company's ability to integrate sustainability into its internal processes to capture sustainable value and to use KPIs for monitoring sustainability strategy (Cavicchi and Vagnoni, 2022), in particular after the introduction of a sustainability plan.

This study contributes to the literature in several ways: first, it helps to understand the link between sustainability implementation evolution and performance management systems, as requested by Montemari et al. (2019). The PMS is linked to the development of the company's business model, allowing the company to make informed choices to better direct the strategy. Furthermore, the use of KPIs increases corporate accountability through disclosure (Adams et al., 2014): in the case analyzed, we see how the company has not only been publishing sustainability reports for some time but has also drawn up and partially shared (in terms of actions and targets) a sustainability plan.

With particular regard to the agri-food sector, the study offers insights from an in-depth case study according to Tell et al. (2016).

The study has limitations, primarily the fact that it considered only one case. Future research may expand qualitative research to investigate the relationship between sustainability adoption and PMS in further agri-food cases.

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