

A Work Project, presented as part of the requirements for the Award of a Master's degree in
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SUSTAINABLE INNOVATIONS IN THE FOOD INDUSTRY

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Abstract

This work project investigates the role innovations have in solving the problem of unsustainability of the food industry, and aims at understanding if they can be a solution to this problem. More specifically, it will be investigated why the food system is not sustainable, what steps companies in this industry need to take to implement sustainable innovations, and what benefits these bring to organizations. Furthermore, a case study will be presented, and the company [REDACTED] will be analyzed in the aforementioned subjects.

Keywords: sustainability, innovation, food industry, possible solutions

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1. Introduction

“The current food system is unsustainable, unequal, destabilizing and unhealthy” (FReSH insight report, 2018). In the world, more than one-third of the food produced worldwide is wasted, 40 percent of agricultural land is degraded, 800,000 people in the world are malnourished, and food shortages often lead to civil unrest (FReSH insight report, 2018). Moreover, more than 1 billion people worldwide are obese, a fact that leads to increased diseases and relative healthcare needs, both in developing and developed countries (World Health Organization, 2022). A complete transformation and adjustment will be needed to fix this malfunctioning system, and the aim should be to provide a healthy and nutrient-dense diet for all while minimizing and eventually eliminating the waste and the impact on the environment and on the people working in the food supply chain.

The Food and Agricultural Organization of the United Nations (FAO) estimates that 30 to 40 percent of total food production can be lost before it reaches supermarkets and retailers (“Food Wastage Footprint & Climate Change,” 2011), which results in a significant loss of resources—both for the products themselves and for everything used to make them. Thus, businesses naturally play a significant role in the overall sustainability of the food system and consequently also in the implementation of the aforementioned radical change.

In this thesis, the focus will be on companies and businesses, that contribute in one way or another, to the environmental impact of the world food system. In particular, the focal point will be the sustainable innovations that take place and will take place in the food supply chain. The problem statement I will work on is the following:

“Un-sustainability in the food industry: are innovations a possible and financially-feasible solution?”

To dive deeper into this topic, I will also investigate the following sub-questions:

1. Why should sustainable innovations take place in the food sector?

The first step for solving a problem is to understand and recognize that there is one. The answer to this question will serve this purpose and will help the readers understand the reasons why the food sector is not sustainable and why people and companies need to take action as soon as possible.

2. What are the steps that companies in the food sector need to take for sustainability-related innovations to take place?

This second sub-question aims at understanding how to translate into reality the ambition that companies have of innovating sustainably. The reason behind this is that it could happen that especially smaller companies do not know how to start innovating if it's a process they have not practiced before. Hence, the answer to this will give guidelines and possible solutions.

3. What are the benefits that companies get when investing in sustainability-related innovations?

In this case, the goal is to investigate if and how sustainable innovations payback, either financially, socially, or environmentally. It is crucial to understand the benefits they bring because ultimately companies can only survive if the returns they get are larger than the investments made. This will hopefully add more value and convince that it is possible to simultaneously be environmentally and socially sustainable and grow as an organization.

To answer these questions, the following theoretical topics will be assessed, which aim at summing up the information that will be reported in this document:

1. The unsustainable food system: it will be explained why the current food system is considered unsustainable, giving some data, and explaining some processes that lie behind what we find in supermarkets every day. In this chapter, the first sub-question will be answered.
2. Consequences of the un-sustainability of the food system on the environment
3. Importance of companies' actions: they have a major impact and thus their actions are crucial for the improvement of the status quo.
4. Barriers and incentives companies face innovating sustainably, that influence the rate and way at which innovations are adopted.
5. Value chain of innovations: three main steps of innovations will be explained, namely idea generation, idea conversion, and idea diffusion. Here, the second sub-question will be answered.
6. Green marketing: increased revenues and performance or greenwashing?
7. The benefits of sustainable innovations: the effects they have on the organizational performance. In this last part of the literature review, the third sub-question will be assessed.

After the literature review, a case study will be analyzed where the concepts previously discussed will be applied [REDACTED]. is a pasta-making company based in [REDACTED]. This company has been chosen for different reasons. First [REDACTED] is a great example to see how companies put into practice the theory reviewed, as it complies with and matches it in different ways. On the other hand, there are some dissimilarities that are also interesting and add value to the discussion. Moreover [REDACTED] has some well-set and successful

ongoing projects, but also some that are being developed and tested, and others that are in the very early stages. This is very valuable for the discussion, as it helps assess how the company deals with the various stages of sustainable innovations, and how it assesses the benefits they bring. The size of [REDACTED] is also ideal, as it's not a SME, but also not a multinational: this makes the case study extendable to a multitude of companies, both bigger and smaller ones. Furthermore [REDACTED] undoubtedly puts a lot of effort into the topics of sustainability and innovation: they are now building a new team to develop further the ongoing projects and to implement new ones, the investments continuously made are large and involve different departments of the organization, and many external firms have already been involved (like top tier consultancy firms). The amount of information that was collected is considerable, and it was possible mostly because I have been an intern at the main headquarters in Italy for some months and I had the chance to interview and get insights from different employees, including the innovation and sustainability manager. It was difficult to obtain such detailed information from other organizations, either because they are not willing to share them or because they don't have a sustainability and innovation plan at all (especially smaller companies).

The aim of this thesis is to contribute to the literature by the application of the concepts reviewed to the food industry. Most of the currently available literature either does not pertain to a specific industry but is rather general in its application or the theories are applied to other industries. For example, a paper by Cillo et al. (2019), does a complete literature review on sustainable innovations, but there are no references to the food industry. Also Schaltegger and Wagner (2011) investigate sustainable innovations, relating them to sustainable entrepreneurship, but never reference a particular industry. Other papers have very narrow applications and are thus different from what will be found in the next pages. For example, Herrero et al. (2020) focus on technologies to be implemented to innovate sustainably: it is very specific and technology oriented and does not cover the role innovations have to create a more sustainable food system.

The paper by Román et al. (2021) examines the tensions derived from sustainable innovations and how companies solve them but does not investigate the reason why companies do them in the first place, what steps they take to implement them or what benefits they bring. Jeong and Shin's study (2020) relates to the food industry but focuses solely on SMEs in South Korea and the relationship among drivers of sustainable innovations such as government support and R&D investments. A final example is the paper by Betoret et al. (2016), that focuses on the quality of foods and on engineering techniques to help companies increase their sustainability.

Applying the concepts previously described to the food system and investigating the usefulness and feasibility of sustainable innovations, will generate more insights regarding the topic in this industry specifically. This, in turn, can help organizations to make choices and undertake projects related to sustainable innovations, knowing the importance they have, what steps to take, and the benefits they generate.

2. Literature review

2.1 Why sustainability and innovation?

In this chapter, the first sub-question will be addressed: it gives an overview of the current food system and of the reasons why it is considered unsustainable. Sustainability and sustainable practices are among the most discussed topics of the last few years, mainly because of the urgency of radical changes in the behavior and mindset of consumers, companies, and governments (“Food Wastage Footprint & Climate Change,” 2011). The world’s population is increasing at a dramatic pace (World Population Prospects, 2022), and even if the resources we have are finite, every year humans waste more than 30% of most natural resources (Marín-Beltrán et al., 2022). The current food system is one of the main threats to our planet: the intensification of farming or the chemical substances given to animals to reduce the cost of producing meat, the necessary means of transport that need to get involved to get exotic food to the rest of world, or the huge energy usage, are just some examples of the increased impact of the modern food system (“Food Wastage Footprint & Climate Change,” 2011). Another impacting characteristic of the current food system is waste: FAO states that around the world more than one third of the food produced (1,3 billion tons) is wasted (“Food Wastage Footprint Impacts on Natural Resources,” 2013), and this has terrible impacts on the environment. Food waste is responsible for more than 8% of the global greenhouse gas emissions, which are the main responsible for global warming (“Food Wastage Footprint & Climate Change,” 2011). To understand this number better, take into account that, behind China and the USA, food waste would be the third-largest emitter in the world. (“Food Wastage Footprint & Climate Change,” 2011). 14% of food waste occurs between the stages of harvest and retail (“Food Wastage Footprint & Climate Change,” 2011) and it generates a large loss of resources, both of the products themselves and of everything that was needed to produce them (e.g. use of land, water,

energy, chemicals...).

One way businesses can approach sustainable consumption is through sustainable innovation: “a process where sustainability considerations (environmental, social, financial) are integrated into company systems from idea generation through to research and development (R&D) and commercialization. This applies to products, services, and technologies, as well as new business and organization models” (Martin Charter & Tom Clark, 2007). The goal in this case is to hand out considerable societal value while reducing the usage of resources and the environmental damage, and of course, limiting waste as much as possible. Strategies are to be built around the social benefits that the product delivers, and new business models linked to sustainability are emerging thanks to the increased awareness by companies and by customers (Geissdoerfer et al., 2018).

2.2 The power of open sustainability innovations

Because sustainability is a problem for everyone, it is important that companies cooperate and work together towards a more sustainable food system. According to Arcese et al. (2014), sustainability is becoming a source of competitive advantage and it is a strategic aspect that adds a plus to competition and that should thus be exploited. Because customers are becoming more and more attentive to different aspects of sustainability, another benefit of sustainable innovations is the increased, more credible, and valid, overall perception that customers have of the company. Sustainable product innovation is strategic for things like profit growth, environmental sustainability, and improved life quality. (Arcese et al., 2014). It has to be considered that in the food industry specifically, sustainable innovations are mostly incremental rather than radical (due to the flexibility to change of the demand and of consumers), and the innovation rate is generally quite low (Arcese et al., 2014).

Some other characteristics of the food industry are the growing number of supply chain participants, the big difference in the demands of consumers, end-users, and legislators, and the need for greater quality standards (Arcese et al., 2014). All these aspects are pushing the sector to look for new innovation partners and sources, and lead to think that to reach both industry and sustainability objectives, open sustainability innovation could be a strategic advantage.

All chain participants in the food industry have an impact on the sustainability of the supply chain (Grunert, 2011). The entire food system, from agricultural production to distribution, retail, home meal preparation, and waste, impacts the environment significantly. A great example of this is food waste: every step of the value chain adds some percentage points to the wasted edible food, which reaches the aforementioned 33% by the time the products arrive at the end consumer (“Food Wastage Footprint & Climate Change,” 2011).

As a result of the considerations made up to this point, it is understandable that technological and managerial innovations are key factors for the changes needed to support the conservation of the environment and that these problems should be faced together, with companies operating collectively towards a common goal.

But which are the factors that influence these innovations? Companies have different incentives and obstacles when it comes to sustainable innovation, and these will be analyzed in the next chapter.

2.3 Incentives and obstacles to sustainable innovations

According to Vasilenko et al. (2012), the biggest barrier to the creation and adoption of sustainable solutions has been identified as the lack of financial resources, as in many cases companies need to invest their profits in more operational activities and sustainability easily falls in second place. Then, lack of time also appeared to be a considerable obstacle, probably

because, especially for smaller enterprises, sustainability issues are often left for the individual consideration of the top manager, as they might be not considered important enough to be delegated to other employees. Another obstacle that came out from the study is the lack of information about sustainable innovation, especially for those enterprises that have little to no experience in this. An additional problem is human resources, thus the lack of qualified personnel: for those companies that have already put into practice sustainable innovations, this is considered a major obstacle by 13% of the respondents, while for those that don't the percentage raises to 27% (Vasilenko et al., 2012). To sum up, the main barriers are the lack of competence and awareness in sustainability and of the means, both financial and operational.

On the other hand, Vasilenko et al. (2012) found that incentives influencing companies' sustainability performance improvement can be external (for example regulations, financial incentives, technical assistance, and market conditions) or internal (such as gaining competitive advantage or cost savings). Referring first to external incentives, those related to finances are considered by SMEs to be of great importance in the context of sustainable innovation development and implementation, including public funding programs to be allocated to innovations, and taxes, fees, and subsidies from the state. Another strong incentive came up to be customer requirements, as well as the legal framework the company operates in, meaning the legislations and industry standards and norms (Vasilenko et al., 2012). This last point slightly differs comparing companies that have experience in sustainable innovations and those that don't: more respondents in the first group consider it of major importance, which led the authors to assume that the laws and rules in place forced the enterprises to innovate sustainably, to comply with the set standards (Vasilenko et al., 2012). Considering now internal incentives, the ones that resulted to be most important are cost savings and profits that follow from the implementation of sustainable innovation, together with competitive advantage in the market, that is also considered very valuable (Vasilenko et al., 2012). Summing up the incentives, the

most significant ones are financial and legal, but also customer demand and the savings and costs that result from the implementation of sustainable innovations (Vasilenko et al., 2012).

2.4 The value chain of innovations: what are the needed steps for companies to innovate?

Once the innovation becomes practice or starts to, Hansen and Birkinshaw (2007) recommend looking at its value chain, which the authors based on the conclusions of five significant research studies that were undertaken between the 1990s and early 2000s. To answer the second research sub-question, it can be said that innovation is viewed as a sequential process in three phases: *idea generation*, *conversion*, and *diffusion* (Hansen and Birkinshaw, 2007). Across these steps, managers need to execute 6 important tasks, that are: internal, cross-unit, and external sourcing, selection, development, and companywide spread of the idea (Hansen and Birkinshaw, 2007). Each of these ties to the chain at various stages and ways. The strongest links are those in which the company excels, while there may be some others that the firms struggle with, that are the weakest links.

Hansen and Birkinshaw (2007) proposed a framework, depicted in figure 1, according to which executives need to have a complete understanding and overview of the innovation processes inside the company. Moreover, they should avoid introducing innovation practices that were developed by or for other organizations and implement them in their own without adapting them. The reason is that they may be generally valuable but not the ones needed for the specific company's weaknesses. The idea around the framework is that "A company's capacity to innovate is only as good as the weakest link in its innovation value chain." (Hansen and Birkinshaw, 2007). It is thus understandable that managers should focus on those links which they struggle the most with, to better their efficiency and in turn improve the overall innovation performance.

	IDEA GENERATION			CONVERSION		DIFFUSION
	IN-HOUSE Creation within a unit	CROSS-POLLINATION Collaboration across units	EXTERNAL Collaboration with parties outside the firm	SELECTION Screening and initial funding	DEVELOPMENT Movement from idea to first result	SPREAD Dissemination across the organization
KEY QUESTIONS	Do people in our unit create good ideas on their own?	Do we create good ideas by working across the company?	Do we source enough good ideas from outside the firm?	Are we good at screening and funding new ideas?	Are we good at turning ideas into viable products, businesses, and best practices?	Are we good at diffusing developed ideas across the company?
KEY PERFORMANCE INDICATORS	Number of high-quality ideas generated within a unit.	Number of high-quality ideas generated across units.	Number of high-quality ideas generated from outside the firm.	Percentage of all ideas generated that end up being selected and funded.	Percentage of funded ideas that lead to revenues; number of months to first sale.	Percentage of penetration in desired markets, channels, customer groups; number of months to full diffusion.

Figure 1: value chain of innovations. Source: Hansen and Birkinshaw (2007)

Let's now look at the three phases from Hansen and Birkinshaw (2007) in detail:

1. *Idea generation*: sustainable innovations start with good ideas but understanding where and how to get these ideas from is not easy. Managers commonly look first within their teams or business units for creative new concepts. But from the studies, it's discovered that executives believe that when disparate thoughts join together, the brightest sparks are created, for instance during brainstorming sessions with people from different units or when external companies get involved. Cross-unit collaboration is thus extremely effective for this first phase of the innovation value chain, and it can be defined as "the combination of insights and knowledge from different parts of the same company in order to develop new products and businesses" (Hansen, 2009). The issue is that this kind of collaboration is difficult to accomplish because factors like geographical dispersion and decentralized organizational structures can make it difficult for people to brainstorm and put their ideas

together. Also looking for ideas outside the company is crucial, and businesses should ask themselves if they are getting enough good ideas from external stakeholders. These can be for instance customers, competitors, end-users, universities, suppliers, investors, etc. This is a form of open innovation, and if this is not done correctly, many opportunities can be missed, resulting in lower innovation productivity.

A negative example to understand the importance of collaboration is Sony: after impressive performances throughout the 80s for the development of innovative products such as the PlayStation, the engineers started to think everything made internally was better than what came from outside the company, as stated by Sir Howard Stringer, the CEO, in an article in the *New Yorker* in 2005. This damaged the company as they were resistant to collaborating with external stakeholders, and missed opportunities in fields such as flat-screen TVs and MP3 players were the outcome of this. (Hansen and Birkinshaw, 2007).

2. *Idea conversion*: this stage is crucial for having a positive sustainable outcome, as there can be many obstacles for the ideas to actually become reality and they should thus be handled carefully. Fundamentals are strong screening and funding mechanisms, as in companies with tight budgets allocated to innovations, conventional thinking, and rigid funding criteria, ideas can be shut down. In these environments, employees understand that their ideas would probably not be considered, and the flow of ideas will in turn dry up. The issue with other businesses is that management are not stringent enough when it comes to funding and screening, leading the organization to take over also projects of lower quality that might not fit into the bigger corporate strategy. Once the ideas are screened and the best ones are funded, they must be transformed into goods, services, or procedures that generate income.

An example to stress the importance of giving the right weight to screening the ideas is the UK media company Emap, that in 1999 invested aggressively in many digital business ideas, worried to fall behind competitors. This impulsive investment resulted in millions of dollars of losses in the following years. The company should have made a more accurate screening understanding of the real potentiality of the ideas implemented, that resulted to be a failure (Hansen and Birkinshaw, 2007).

3. *Idea diffusion*: once the concept went through the first two phases and has been developed, it's time to aim at receiving revenues for the efforts made. It is not easy to support and spread the innovation in large organizations, spanning numerous channels, client segments, and geographic locations.

An example of the importance of the performance in this phase is P&G: after successfully launching Pampers diapers in Germany, it took too long to launch them also in France (5 years). Two years before P&G presented their product in France, Colgate-Palmolive introduced a mee-too brand of diapers and dominated the market (Hansen and Birkinshaw, 2007).

To sum up, the first step is all about strict collaboration within units (in-house), across units (cross-pollination), and with external parties, which will finally lead to a few strong and definite ideas on what would be the goals of the innovations and how to implement them. The next stage is conversion, where a screening and initial funding are made (selection), and then a first development occurs, thus a movement from the idea selected to the first results. Finally, the diffusion stage happens when there is dissemination across the organization of the selected innovation, that is spread across the different departments.

Another method for the development of innovations is called the Stage-gate system, which is defined as “a conceptual and operational roadmap for moving a new product project from idea

to launch – a blueprint for managing the product innovation process to improve effectiveness and efficiency” (Cooper, 1990). This method divides the journey to innovations into stages, and the entrance to each one is a gate, where ideas are controlled and serve as go/kill checkpoint (Cooper, 1990). The five stages can be matched with the three-step value chain by Hansen and Birkinshaw (2007): idea generation matches “Discovery and ideation”; idea conversion corresponds to the stages of “Scoping”, a fast and preliminary investigation of the projects ideated, “Build the business case”, a more detailed one that leads to a business case, “development”, where the detailed design is developed and “testing and validation”, where tests and trials are made; finally idea diffusion corresponds to “Launch”.

Looking at innovations from a value-chain perspective is helpful also in finding the weak links that need to get revised. It’s a common mistake to only focus on those in which the company is stronger, but it’s risky and managers should instead try to improve and get better at their weakest links, that need to complement the strengths in other areas.

2.5 Green Marketing

Because of the increasing awareness on the side of consumers of the environmental problems the world is facing, companies in the food sector use their innovations and sustainability efforts to attract new customers and retain existing ones. This is also done through green marketing: packaging specifying new sustainable features, advertising of different types stressing the little environmental impact implied in the product, donations to and collaborations with companies that aim at sustainable activities, etc. All these practices aim at enhancing the reputation of the companies that adopt them and at increasing their competitiveness.

The problem with green marketing is that many companies exploit its advantages, making consumers believe that what they buy is sustainable, but the product or service is in reality not

good for the planet. It could also happen that firms producing something marketed as having a low environmental impact, are responsible for a very large footprint in other internal operations, making the effort overall ineffective. This is called greenwashing and it's defined by Merriam-Webster dictionary as the "the act or practice of making a product, policy, activity, etc. appear to be more environmentally friendly or less environmentally damaging than it really is" ("Greenwashing," n.d.). Unluckily this practice is quite frequent, and the European Commission in 2020 reported a study in which green marketing activities were examined, and it was discovered that 42% of the promises were overstated, inaccurate, or deceptive and may have violated EU laws against unfair business practices (Press Corner, n.d.).

2.6 What are the benefits of sustainable innovations?

But how do these sustainability efforts pay back the company? To answer the third and last sub-question, a study conducted by Maletič et al. (2015), will be analyzed and it aims at examining the fundamental design of innovation practices that are focused on sustainability as well as on how they affect the specific performance dimensions, such as economic, quality, environmental, social and innovation performance. The paper states that organizations should consider environmental and social issues when making decisions, to promote moral and legal responsibility, but also at the same time be concerned with the sustainable economic success of the organization. Thus, in accordance with Hart & Milstein (2003), sustainable organizations are characterized by the triple bottom line: a simultaneous contribution to economic, environmental, and social benefits. Van Kleef and Roome (2007) also contend that developing skills that promote innovation for sustainable development can serve as a competitive advantage and serve as the foundation of competitiveness. Companies that support sustainable innovation, for instance, might introduce new goods and services faster than rivals that don't in order to better meet changing consumer demands (van Kleef and Roome, 2007).

The results of the study by Maletič et al. (2015) show that there are some notable connections between innovation techniques that are sustainability-focused and the different organisational performance elements. The study's findings provided evidence in favor of the concept that using sustainable business practices has a favorable and positive impact on company performance. As a result, there is empirical proof that a company can gain from creating and implementing sustainability-focused innovation practices (Maletič et al., 2015). Diving deeper, the results also show that companies would improve their performance by integrating into their processes and products aspects related to sustainability (Maletič et al., 2015). These findings provide some credence to the claim that organizations can increase their economic benefits without compromising the environment or local communities by including sustainability activities in the design of products and processes (Pujari, 2006; Schrettle et al., 2014). According to this viewpoint, the abilities necessary to gather stakeholder demands and transform them into original solutions (such as products, services, procedures, or strategies) are stakeholder conversation and stakeholder knowledge integration (Ayuso et al., 2006). Because of this, and in accordance with the principles of continuous development, it is best to include sustainability considerations into both tangible and intangible products and processes, keeping a continual eye on the requirements and preferences of stakeholders (Maletič et al., 2015).

The study by Maletič et al. (2015) also found that sustainability-oriented process, product, and innovation competencies deployment are positively associated with: innovation performance, with high performing innovations defined by the fact that with little marketing effort and rapid adoption of the innovation, it spreads quickly to the outer reaches of the social network (Muller & Peres, 2019); social performance, defined as “an organization’s configuration of principles of social responsibility, processes of social responsiveness, and policies, programs, and observable outcomes as they relate to the firm’s societal relationships” (Wood, 1991); and quality performance, the degree to which their services and products' quality rises and is

satisfactory to customers (Maletič et al., 2015). On the other hand, while there are some differences in the cases of environmental performance. Regarding innovation performance, the study confirms the prior theory (Hockerts et al., 2008) that states that sustainable innovations boost innovation performance. Sustainability-focused creative practices therefore seem to be beneficial in terms of social performance, as also previous studies (Gond et al., 2010) have shown that these practices have a favorable impact on job satisfaction and a negative impact on intentions to leave one's employment (Maletič et al., 2015). Also, quality performance overall is proven to benefit from sustainable innovation practices, but it's important that companies include stakeholders' demands and considerations in order to maximize performance and competitive advantage (Maletič et al., 2015). Going on with the environmental performance, the study confirms that the deployment of sustainability-focused process and product competencies has a favorable and significant impact, but not that of innovative competencies (Maletič et al., 2015). Additionally, there is a substantial performance gap in terms of the degree of adopted sustainable practices, meaning that higher levels of sustainable process/product competencies used to lead to stronger positive impacts on environmental performance (Maletič et al., 2015).

To sum up, organizations can increase their innovation, quality, social, and environmental performance by putting a significant emphasis on sustainability practices, which are favorably correlated with total organizational performance (Maletič et al., 2015).

3. Case study: [REDACTED]

[REDACTED] is a pasta producer in [REDACTED], Northern Italy. The company was started by [REDACTED], now 84 years old, first as a small handmade pasta shop in the province of [REDACTED]. It then expanded a lot over the years, and they now operate worldwide in almost 60 countries, especially in Europe and for a few years in the US. In Italy, the brand is very well known and some of its products have a penetration rate of more than 60%. The company almost reached the milestone of 1 billion euros in revenues in 2021, has about 3500 direct and indirect employees, and has a portfolio of more than 1000 products.

Since a few years, there was an increase in the importance given to sustainability within the organization and implemented a department dedicated to this. Thus, there is now a sustainability and innovation manager that engages with these themes and brings forward the projects that will be described in the next pages.

All the information displayed in the next pages was collected from a variety of sources, which included multiple in-depth interviews with [REDACTED], sustainability and innovation manager at [REDACTED], as well as two internal documents: one regarding the corporate sustainability strategy, and one regarding more specifically the objectives and initiatives related to sustainability. To ensure the reliability of this paper, the interviewee was not informed on the theories and outcomes of previous studies and was thus not biased in his answers.

3.1 Main incentives and obstacles: why does Rana engage in sustainable innovations?

To answer and apply to the case study the first sub-question, thus understanding why [REDACTED] innovates sustainably, it is interesting to assess the main incentives for the organization to do so: they are in line with what was discussed in chapter 2.3. Social pressure was one of the main drivers, as well as macro trends that are developing all over the world. On this line, Customer

Relationship Management (CRM) also puts pressure as customers were repetitive in their complaints about the non-recyclability of the packaging of a few products. Another crucial aspect is legislative: new regulations and laws spur companies like the Pastificio to implement sustainable practices. Thus, social, legislative and customer preferences factors are the main drivers and motives for [REDACTED]. Moreover, new young and motivated people joined the company in the last years, first of all [REDACTED] [REDACTED], and took with them the millennial mentality that considers sustainability a much more important topic than past generations.

This also relates to the main obstacle faced by the organization: the creation of a culture prone to sustainability practices and innovations at all levels of the organization. Moreover, another difficulty was the engagement of top management in these projects. Sustainability and all the related topics are becoming an intrinsic part of the daily discussions that take place at the company. Many other departments are involved in first person in diverse projects, and thus work together on solving sustainability issues.

The incentives faced by the organization are in line with what was discussed in the literature review, even if the aspect of financial incentives is considered of lower importance, as well as the savings and costs that sustainable innovations can generate. Also the obstacles are in line with the study made by L. Vasilenko et al. (2012) discussed previously, even if the lack of means was not mentioned and is thus not considered a crucial problem.

3.2 Sustainability report

To help pursue their sustainability aims, companies started publishing sustainability reports. They are defined by the Italian ministry as “the outcome of a process by which the administration accounts for the choices, activities, results, and use of resources in a given period so that citizens and the various stakeholders can know and make their own judgment on how

the administration interprets and realizes its institutional mission and mandate” (“Direttiva Del Ministro Della Funzione Pubblica Sulla Rendicontazione Sociale Nelle Amministrazioni Pubbliche,” 2006). From 2024, companies with more than 500 employees and either a balance sheet that amounts to 20 million euros or net revenues worth more than 40 million, will be required to publish a sustainability report (“Guidelines on Non-financial Reporting: Supplement on Reporting Climate-related Information,” 2019). ██████████ falls into this category, and it is working on its sustainability report. They aim at spreading the first sustainability report this year only internally among employees, and publicly in the years to come, as executives believe in its potentiality and benefits. Figure two is used internally and depicts well the positive outcomes of this report for the company.

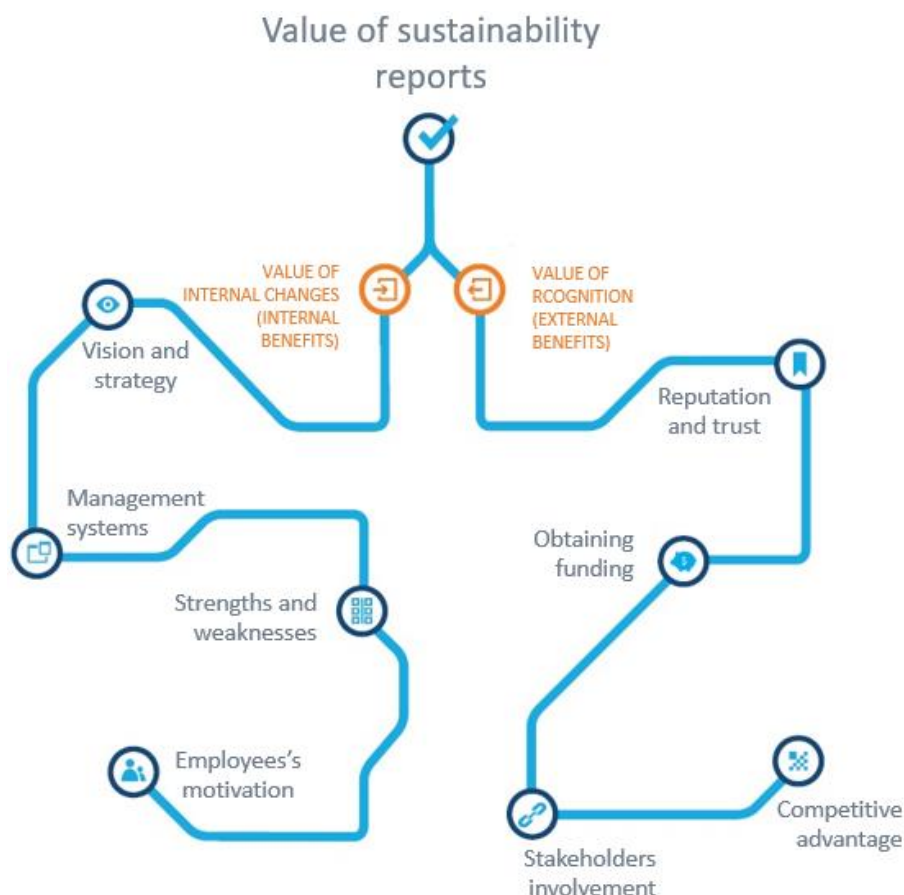


Figure 2: benefits of sustainability reporting. Source: Ali srl.

In figure 2, we see that two kinds of benefits will be created from the publication of the sustainability report: internal and external. First, the vision and strategy of the company regarding sustainability will be clearer and communicated also to employees in a more direct way. Moreover, the management systems will have to be analyzed and adjusted if needed, while the strengths and weaknesses of the organization will be clearer and will thus be respectively exploited and improved. Lastly on the internal side, the motivation of employees will increase, as they will have a goal in mind and will try harder to reach it. On the other hand, the expected external benefits are improved reputation and trust, ease in obtaining funding, and increased involvement of stakeholders as transparency will be higher. All of these positive outcomes will increase the competitive advantage of the company (“Corporate Sustainability Strategy,” 2022).

3.3 The company’s strategy for sustainability: what is the value chain of innovations at

██████

The second sub-question regarding the steps to take to innovate sustainably will be applied to ██████ in the next pages.

The business places a high value on core strategies because they define priorities and offer a shared framework for allocating resources, making an effect, and communicating results. Sustainability is no exception to this, as it also needs some guidelines to follow. A sustainability strategy builds buy-in amongst colleague, drives performance by pushing the business to reach its goals, directs resources and investments into the most crucial areas, and engages external stakeholders in meaningful engagement (“Corporate Sustainability Strategy,” 2022).

At ██████, the company’s strategy process has been divided into 5 steps: defining the mission, vision, and values of the company, identifying the issues that are most relevant and consequently prioritizing them effectively, defining the target and KPIs, and finally

implementing the outcomes. A summary is depicted in figure 3.



Figure 3: stages of sustainability strategy. Source: “Corporate Sustainability Strategy,” 2022.

These stages that [REDACTED] implements can be recognized also in the value chain of innovation described by Hansen and Birkinshaw (2007) . The first three steps of identifying the vision, mission, and values and the issues that are most important, correspond to the idea generation phase, as these are the stages where new concepts are formed and collaboration with both external parties and other divisions within the company is very strong. Then, the prioritization of the issues identified and target and KIPs definition at [REDACTED] correspond to idea conversion: managers must understand which projects and ideas fit best into the corporate strategy and are most profitable and effective in the longer term. Lastly, implementation correlates with idea diffusion, when the innovation and new project are implemented and spread across the company.

3.3.1 Vision, mission, values

To maximize the use of the resources at hand, the vision, mission, and values serve as a powerful guide for integrating and organizing actions and decisions. Setting a purpose for the present and the future is crucial since strategy is about making effective use of limited resources. Establishing a clear and compelling objective offers the broad framework or criteria against which judgements on the distribution of resources should be made and evaluated from the standpoint of strategic thinking (Horwath, 2005).

The vision of a company depicts the desired end goal, the future world that the organization

wants to create. It is crucial for the sustainability plan since the motivational and business-relevant language connects the strategy to the goals the company is attempting to achieve. ■■■'s vision statement is "Becoming the family of Italian food". It refers to becoming more and more internationally known for bringing Italian excellence abroad and in Italy itself. Being recognized as a family is also seen in the future of the organization, as it is now all over the world ("Corporate Sustainability Strategy," 2022).

The company's identity and work are portrayed in the mission statement. In other words, it refers to the company's activities for realizing its vision, including what it does, for whom, and how. It is relevant to the sustainability strategy since it serves as a foundation for strategy by outlining what the company is attempting to accomplish. At ■■■ the mission statement is "To provide the world food good for the body, the soul, and the planet, with the best ingredients and with love and passion". Thus, the what is to produce good food, it's done for people all over the world, and the how is by keeping on using the best ingredients, love, and passion ("Corporate Sustainability Strategy," 2022).

The guiding principles that an organization lives by and uses to evaluate its actions are known as its values. They are significant because the sustainability plan should incorporate them and offer practical ways to put the principles into practice. At ■■■, they are many and diverse. First, family is very important and to foster the need to stay together. This theme emerges in all of the advertising campaigns and events, and it is very present also in day-to-day work life at the headquarters. Innovation is also a very recurrent subject, and it aims at overcoming challenges to move forward. The company also had a part of its plant named "house of innovation" and there is a division for marketing innovation, with employees solely focusing on that. Other values are passion, hence to deliver quality and love for beauty; trust, to work together towards a sustainable and common future; integrity, for being transparent and respecting the people and the planet; quality, to make sure everything regarding ■■■ is at its

best version. These are some of the values that drive the company's action, both internally and as a base for communication ("Corporate Sustainability Strategy," 2022).

3.3.2 Identifying the issues that matter

The next step is that of identifying the main issues. The way [REDACTED] does this is through a materiality assessment. According to NYU Stern, "an issue is material if it could substantively affect the organization's ability to create value in the short, medium, and long term" ("Sustainability Materiality Matrices Explained," 2019). The idea of double materiality was publicly presented by the European Commission in the Guidelines on Non-financial Reporting in 2019, according to which companies should judge materiality with two perspectives: the first is "the extent necessary for an understanding of the company's development, performance and position" and "in the broad sense of affecting the value of the company", and the second is how various stakeholders are affected by the company's social and environmental effects ("Guidelines on Non-financial Reporting: Supplement on Reporting Climate-related Information," 2019). These two perspectives have to get together and their interconnectivity should be assessed.

As a result of the company's belief that paying attention to what shareholders, customers, and employees think is crucial can help it better serve these groups [REDACTED] also values stakeholder feedback and uses it to uncover problems. Additionally, it would send out early warning signals because by being aware of worries about recent and rapidly emerging problems, businesses may reduce risks, keep one step ahead of rivals, and adjust to changing customer demands more quickly. Additionally, it offers a level of complexity that is uncommon to find within an organization: occasionally, the most crucial problems are not those that the business would recognize on its own. Critical players might offer fresh perspectives and friendly competition that internal dialogues would not otherwise be able to supply ("Corporate Sustainability

Strategy,” 2022).

The level of interest that the stakeholders have in the specific issues is planned to be assessed by [REDACTED] mainly through surveys, interviews, and from customer relationship management. This year, for time constraint reasons, the company did it in a simplified way for its internal sustainability report: the responsible directors of all the areas were asked to embody the relevant stakeholders answering the survey. These means give the company a good insight into what the customers and other stakeholders find more valuable and important and what on the other hand is not considered meaningful.

The organization classifies the abovementioned inputs from stakeholders and ranks them from low to very high level of interest. Then, the importance and the impact the specific issues can have on the business are also assessed. Once this process is completed, it is made clearer what are the issues that have both a high impact on the company and are of high interest to the stakeholders. These are the issues that will be carried on to the next stages of the strategy.

3.3.3 Prioritizing effectively

But a good strategy, to be effective, need prioritization, a hierarchy, and a focus. A few top priorities where the company wishes to make a significant long-term influence should be the focus, along with more ambitious goals that concentrate on the material areas (“Corporate Sustainability Strategy,” 2022).

[REDACTED] identified three pillars on which they want to focus in order to become a more sustainable company (“Mappatura Obbiettivi e Iniziative,” 2022):

1. *Taking care of people* (employees, consumers, and suppliers): the company has always given a lot of importance to people, particularly its employees. For example, one very famous advertising campaign, that also became a used motto, is “Anche io sono

██████████”, which means “I also am ██████████”. But the company wants to take this a step further, setting challenging objectives. For example, they want to improve well-being and safety in the workplace, and in order to increase diversity and inclusion, they have the objective of enhancing gender balance in the workforce and empowering the present minorities. Moreover, for the theme of talent attraction, development, and retention, they want to promote people’s professional growth, while for the promotion of healthy lifestyles and nutritional education, their objective is to build, share and apply nutrition knowledge (“Mappatura Obbiettivi e Iniziative,” 2022).

This first pillar is summed up in figure 4.

<u>Pillar</u> ██████████	<u>Material themes</u>	<u>High-level objectives</u>
Taking care of people (employees, consumers, and suppliers)	<i>Well-being & Safety at work</i>	Foster the wellbeing of our employees and keep high levels of health and safety at work
	<i>Diversity and inclusion</i>	Enhance gender balance in our workforce and empower minorities
	<i>Talent development and retention</i>	Promote people’s professional growth
	<i>Promotion of healthy lifestyles and nutritional education</i>	Build, share and apply nutrition knowledge

Figure 4: 1st pillar, taking care of people. Source: “Mappatura Obbiettivi E Iniziative,” 2022.

2. *Developing a sustainable and transparent value chain*: the second pillar is about its supply chain, a fundamental aspect of this industry that weighs a lot on the final environmental impact of the products. It is thus of crucial importance to improve it. The first material theme is the availability of raw materials, for which ██████████ has the objective

of ensuring prompt availability. Then, to promote sustainable and resilient agriculture, the company aims at engaging with farmers that practice sustainable agriculture and avoid those that don't pay attention to this. They also want to promote responsible and quality sourcing of all raw materials, intending to select responsible suppliers and raw materials of high quality. The company also wants to implement traceability plans for the main raw materials, also to increase transparency, and lastly, another objective is to provide detailed product nutrition facts ("Mappatura Obiettivi e Iniziative," 2022). Again, this second pillar is summarized in figure 5.

<u>Pillar</u> [REDACTED]	<u>Material themes</u>	<u>High-level objectives</u>
Developing a sustainable and transparent value chain	<i>Availability of raw materials</i>	Ensure the prompt availability of necessary raw materials
	<i>Sustainable and resilient agriculture</i>	Engage with farmers that practise sustainable agriculture
	<i>Responsible and quality sourcing</i>	Select responsible suppliers and quality raw materials
	<i>Supply chain traceability and transparency</i>	Implement traceability plans for main raw materials
	<i>Responsible marketing and labelling</i>	Provide detailed product nutrition facts

Figure 5: 2nd pillar, sustainable and transparent value chain. Source: "Mappatura Obiettivi E Iniziative," 2022.

3. *Innovating products and processes towards sustainability*: this pillar is probably the most interesting for the topics covered so far, and it's the one with the most material themes and consequent objectives. The first regards packaging: many of the current ones

are recyclable, but not all of them, thus the objective is to change those in order to have the full range of products either reusable, recyclable, or compostable. Then, waste management: the aspiration is to reduce it along the whole value chain, to take advantage of every usable resource. This is also done by adopting the circular approach to what is not used during production, meaning that those materials are sold to other companies or valorized in other ways. Moreover, the company identified the theme of logistic optimization, which aims at improving the entire logistic system (very complicated because of the vast territories covered and of the production being in Italy, Belgium, and the US only), with the ambition of reducing emissions. Another current and actual theme is that of water and energy efficiency, which has the objective of defining action plans for the improvement in the management of these elements. Last is the ability to innovate also in the product offerings, always trying to anticipate the needs of customers (“Mappatura Obbiettivi e Iniziative,” 2022).

Once again, the summary of this third pillar is in figure 6.

<u>Pillar</u> ■■■	<u>Material themes</u>	<u>High-level objectives</u>
Innovating products and processes towards sustainability	<i>Sustainable Packaging</i>	Make packaging reusable, recyclable or compostable.
	<i>Waste management</i>	Reduce waste from procurement to production
	<i>Tackling climate change and decarbonisation</i>	Reduce emissions within the production system (for Scope 1 and Scope 2 emissions)
	<i>Logistic optimisation</i>	Improve the internal and external logistic system with a view to reduce emissions
	<i>Energy and water efficiency</i>	Define action plans for improved water and energy management
	<i>Ability to innovate</i>	Innovate products to anticipate costumers' needs

Figure 6: 3rd pillar, sustainable innovation of products and processes. Source: “Mappatura Obiettivi e Iniziative,” 2022.

3.3.4 Target and KPIs

The next step of the strategy is to identify targets and KPIs. This is not at all an easy task, as they have to be both feasible by the company and challenging at the same time. In other words, difficult to reach but doable. This is because employees should feel the pressure of reaching the established goals and put a big effort into pursuing a more sustainable way of doing business, but at the same time, they should feel like they are working towards an objective that they will sooner or later reach (“Corporate Sustainability Strategy,” 2022).

Keeping this in mind, the organization, according to the results of the previous phases, defines a roadmap with a timeline and yearly targets, and parameters to monitor the progress made and the achievements. This stage at ■■■ ■■■ is still ongoing, and the exact objectives and

timeline are being defined now, each with its methods and reaching out to specific experts (“Mappatura Obbiettivi e Iniziative,” 2022).

3.3.5 Implementation

The final step of the sustainability strategy is also among the most important: implementation, when the theoretical work carried on so far becomes reality and real change and innovations happen. ██████████ is already doing a lot in the field of sustainability and is willing and ready to do even more in the future. I will now go through the three pillars analyzed in the previous pages and explain, for each, what the company is currently doing and has done so far. The information in this chapter was sources from the internal document “Mappatura Obbiettivi e Iniziative” (2022) and from the interviews run with the innovation and sustainability Manager at ██████████.

3.3.5.1 1st pillar: taking care of people

Regarding the first pillar, taking care of people, and specifically the objective of well-being and safety at work, ██████████ has set up an ethical and conduct code that every employee and supplier needs to follow. This is to ensure that everyone follows the same rules that are set up and are in line with the ethics and ideals of the company. Also, SMETA (Sedex Members Ethical Trade Audit) is used: it’s a social auditing methodology that allows companies to evaluate their sites and their suppliers mainly on the standards of labor, health and safety, environment, and business ethics, to understand the working conditions throughout their supply chain. Because transparency is at the core of ██████████’s values, a SMETA audit is also conducted at the organization’s own site: this helps increase the visibility of the working conditions to the customers and in case of necessity correct the smaller things that may arise, improving workers’ conditions. The company also promotes safety practices at work, for example, there is a safety

reporting system utilized to manage information on accidents and injuries at the workplace and among the organization's laborers, training is provided to all workers in order to educate them on how to avoid incidents, and equipment for protection from injuries is provided extensively. Another example is that during my internship, which took place from June to September of 2022 when covid was not a predominant concern, masks were available on every floor and there were a lot of information plaques describing the best practices to avoid the spread of the virus. Relating to this, the target is to have “0 accidents” within the company. Furthermore, there are many conventions and discounts in local health-related structures and hospitals, that help employees and aim at easing situations of health complications.

██████████ also wants to bring back the “Progetto Dialogo”, which translates into dialogue project in English: to improve the relationship between the company and its employees, the project began and involved groups of employees that expressed their desires and thoughts to the company. This way the ideas of the outlet (where employees can buy cheese, meat, and other products at the wholesale price at which ██████ buys them), of the medical assistance for the children of employees, of the legal and fiscal consultancy for them, and of language courses were born and became a staple and a certainty for the workers. Another example of the interest of the pasta manufacturing company in its employees and their well-being is the fact that at the beginning of the pandemic, specifically in March 2020, the salaries were increased by 25% for three months, 440 euro worth of eventual babysitting expenses were covered, and insurance in case of contraction of the virus was implemented for everyone working for ██████. To make these actions possible, an investment worth more than 2 million was made (Coronavirus, ██████ ██████ aumenta gli stipendi: piano straordinario da 2 milioni di euro, 2020).

To promote the professional growth of employees, ██████ offers training of different kinds, for example at the moment many courses are going on, for instance of different languages based on the needs and preferences of the single person, of literacy for those workers who can't write

or read for diverse reasons, or of work tools like excel.

Regarding the relationship between the product and the people, there is particular attention to the balance of nutrients in the products, and many analyses are made to ensure genuineness and a satisfying nutritional value. To prove this, [REDACTED] improved the Nutriscore in those countries in which it is adopted by National Authorities and thus exposed on the front of the packaging. The target of the company is to achieve at least a C in every product, but most of them have either As or Bs. In categories such as pesto, where olive oil is one of the main ingredients and are thus high in fats (even if they are healthy ones), obtaining a C is a very good score.

3.3.5.2 2nd pillar: sustainable and transparaent value chain

Going on with the next pillar of developing a sustainable and transparent value chain, and in particular, to ensure the prompt availability of necessary raw materials, [REDACTED] buys its ingredients from different geographical areas, in order to ensure the constant availability of the products. Moreover, in the part of the plant that is called the “house of innovation”, people constantly work to ensure that every ingredient will be available at the beginning of the production of the particular flavor that needs it.

Before externalizing the production of raw materials, the Pastificio itself took care of raw materials and ingredients for their filled pasta. To exploit the know-how created this way, they passed it to the farmers that now grow the products and raw materials used, with whom they have a close relationship and continuous dialogue. This helps in engaging with farmers and motivates and helps them to improve their sustainable agriculture practices. For instance, a widely used product is basil: [REDACTED] follows very strictly its supply chain and for pesto sauce it is using PDO basil from Geneva, that is characterized by tradition, quality and that has to follow rules of production, harvest and transformation that are strictly controlled and certified (Basilico Genovese DOP - Sito Ufficiale Del Consorzio Di Tutela, 2022).

To select responsible suppliers and ensure the quality of raw materials, companies in higher places on the supply chain are asked for their Supplier Code of Conduct. In particular, [REDACTED] is interested in the welfare of the animals and in how they ensure a good level of it, and on their business ethics also with their partners. Furthermore, they are asked about the workers: their fundamental rights, the absence of child labor, that the wages are fair, that the working hours are not extreme and their health and safety in the workplace. Of course, they are also interested in environmental sustainability and the efforts the suppliers put into this topic.

To ensure even more the animal welfare at the suppliers' sites, [REDACTED] asked an external company to help them create a checklist, that was based on the strictest rules that are present in the standards. Thus, before engaging with a new company, they go visit their plants, and only in case everything is checked on the list, they proceed with the partnership.

The raw materials chosen are an indication of the effort put into the sustainability of the production: for example, palm oil is not used and purchased at all and new recipes have been developed to eliminate also rapeseed oil. Also, to safeguard the final consumer other than the planet, the ingredients used are mostly very simple. An advertising campaign that became very famous was centered on the fact that in the products, [REDACTED], the founder of the company who is considered a celebrity in Italy, does not put anything that he would not give his grandchildren to eat. This was a very powerful message, especially for how the Italian culture is, and contributed to the success of the campaign.

Traceability of products is also important to ensure high quality standards to the final consumer and plans to ensure this for all raw materials, as it is for example for the basil. Anyways, internal traceability of products and lots is already a certainty and a well-developed skill of the company.

Nutrition is by all means at the heart of [REDACTED], and thus it's important to provide detailed nutrition facts about the products sold. A lot of relevance is given to food allergies and

intolerances, and labeling these is a necessary means to protect customers. Every quarter meetings take place about these topics and there is a structured system for the managing of the warnings and complaints from customers, to make sure improvements take place and are of valuable interest. The company also has the certificate of conformity in regard to Reg. CE 834/2007, a law that regulates the production and labeling of organic products and is thus entitled to work with these foods.

3.3.5.3 3rd pillar; sustainable innovation of products and processes

The final pillar for the organization is innovating products and processes towards sustainability. The first high-level objective is to make the packaging of the products reusable, recyclable, or compostable. The current packaging for some of the references of fresh filled pasta, the most sold products, is sortable but not recyclable, as they are made with a layer of plastic and one of paper that are not separable. While I was doing the internship, I had the chance to attend some meetings about this topic and many people are working towards the goal of increasing the sustainability of the packaging. A team also went to Poland to attend the first print on 100% plastic sheets. The goal is in fact to have a 100% compostable, reusable o recyclable pack and there is an ongoing project for the reduction of the overall use of plastic to 60% within the next few years.

The company is also working to reduce the waste produced, from procurement to production. To do so, they innovated their machines and for some pasta shapes such as tortellini, they are using some that only need one layer of pasta. This reduces waste by 40-45%, while the rest that can't be avoided is mixed with new dough and reused for the next batches of pasta. Moreover, the R&D team worked to increase the shelf life to 60 days, in order to have it of at least 30 once it reaches the final stores, a very long period for fresh products. This surely helps in reducing waste, as both for companies and for the final consumer it's easier to manage a product if it lasts

longer.

In order to reduce emissions within the production system, a renovation of the older building and the machines used is programmed in the next few years, as they consume more and consequently pollute at a higher rate than the corresponding of new generation.

The logistic system that ■■■■ uses is naturally quite intense, as the production sites are in Italy, Belgium, and the US for every country in which ■■■■ is present and the final product thus needs to be shipped to the rest of the world. Moreover, many supermarket chains want the products delivered to their central hubs and will then make another shipping to the single stores all over the country. A project that the company is working on to improve the situation is finding a way to ship directly to local shops, avoiding this way double transportation, while not increasing excessively the costs, aiming at exploiting economies of scale.

Water and energy management also impacts a lot on the overall footprint of the Pastificio. To improve it, they periodically do an energy audit, in which they assess their energy usage and keep it under control, making sure no flaws are present. The majority of electric energy is green in Italy, as it comes from different sustainable resources like solar panels, and every February they get the certificates of origin on the consumption made the previous year. The company also keeps the heating system of the plants up to date and controlled, is evaluating the installation of more solar panels in some production plants in Italy (specifically those located in ■■■■), and plans on revamping old factories in the next years to improve their sustainability performance.

Finally, to meet future consumers' needs, ■■■■ has already launched products with vegan meat substitutes, like "Bolognew", a soy-based sauce very similar to the traditional Bolognese sauce. Vegan markets are being studied in different countries all over the world and the vegetarian options are already many and well-established, such as the iconic ricotta and spinach tortelli.

3.4 Green Marketing

The company is currently not using green marketing extensively and not in all countries. What is mostly stressed on the packages for example is the quality of the ingredients and the attention put into their selection, other than in general the excellence of the final product.

A practical example is the line of organic products, where it is specified on the packaging that the ingredients come from certified organic sources. Also, in the Spanish packages of most filled pasta products, it's written that there are no conservatives. Another example is in the pasta sheets for making dishes like lasagna, where it is indicated that the eggs are extra fresh and come from free-range chickens, a peculiarity that makes clear the importance given to animal wellbeing in the supply chain.

The sustainability report, once it will be published in the next years, will also be an important marketing tool, as it will be delivered to stakeholders mainly by email and will thus increase brand and corporate values.

Once some projects will take place, they will be advertised, for instance the substitution of the packaging of products that are currently solely differentiable with recyclable material. This is because sustainability has to be communicated to stakeholders because the value it creates is important and also to allow customers to make more responsible and conscious choices.

Thus, at [REDACTED] green marketing is exploited, but it does not fall into greenwashing for different reasons. First, it is not exaggerated, and it has never been the main marketing means or message in any campaign. Moreover, every notion is verifiable and not vague, and many times the labels or certifications that confirm the statements used are on the packaging itself.

3.5 What are the benefits of sustainable innovations for [REDACTED]?

When innovating, companies should also be careful and think about the consequences that undertaking new projects bring. This is what was assessed in the literature review regarding the third sub-question and will now be applied to [REDACTED]. At the company, the return on investments is not always calculated in advance, mostly because it is hard to consider all the variables involved. However, with regards to the energy saved or created sustainably, the ROI of projects can be calculated quite easily. Another example is waste management: all the waste that is recycled, is sold to companies that use it as raw material and this serves as an additional revenue stream.

For their financial returns [REDACTED] is now looking for more objective data to help the top management decide on which projects to invest in.

Moreover, because [REDACTED] gives so much importance to innovation, sustainability is internally seen also as a way to innovate and to keep up with the new needs of the people and of the planet, and it is thus part of a bigger company strategy that goes beyond financial returns.

4. Conclusions

This paper is aimed at understanding and diving deeper into a possible solution to the unsustainability of the current food system: sustainable innovations. The research question was the following:

“Un-sustainability in the food industry: are innovations a possible and financially-feasible solution?”

After the literature review assessed in the first part of this paper and its application to the company [REDACTED] it can be stated with a satisfying degree of confidence that the answer to the research question is that sustainable innovations *can* be a solution for improving the food industry. Companies like [REDACTED] are already undertaking a lot of projects related to this topic and are ready to do more in the future as well, as their importance is evident.

The first sub-question regarded the reasons why the current food system is considered unsustainable. The answer is unfortunately quite simple, as it is enough to think that more than 30% of the food produced (1,3 billion tons) is wasted (“Food Wastage Footprint Impacts on Natural Resources,” 2013), that the agricultural and food sector needs around 30% of the world’s total energy consumption (Holden et al., 2018), and that 8% of the emissions of greenhouse gas is used for food that will never reach consumers’ tables (“Food Wastage Footprint & Climate Change,” 2011). It is clear that something has to change, and that the world cannot afford losing so much every day.

To answer the second sub-question, the steps that companies need to take to reach the goal of innovating sustainably were also observed in the case study: idea generation, idea conversion, and idea diffusion. It can be stated that this value chain is applicable also to companies operating

in the food system, as also [REDACTED] uses it as a base for its operations in this field. Once all these steps are achieved, the innovation is most likely to be long-lasting and thus impacting the environment or community.

Lastly, the answer to the third sub-question is that in the company studied in this research significant returns from sustainable innovations, some easily calculable and some more difficultly were observed. The returns are of different kinds, not solely financial: they are also social and environmental, and these are way more difficult to calculate and have data on.

4.1 Managerial implications

The first managerial implication of this study is simply to act and take action against the unsustainability of the current food system. It is so crucial for us and especially for future generations. Some other implications for managers can be made at this point: what can be suggested is to put pressure on the incentives that are considered most impactful, such as financial and legal, and to “listen” carefully to the changing consumers’ needs and demands that are becoming more and more aware of sustainable practices and value chains. On the other hand, managers need to be aware that one of the main barriers to sustainable innovations is the little competence and awareness of employees. As confirmed by the case of [REDACTED], cultural changes are needed, and to reach this some courses or seminars can be implemented, sustainability can become a daily discussed topic that needs to be assessed for every project, and more generally there should be an effort to make also older generations aware of the importance and impact of every action. Moreover, managers should make sure that employees have both financial and operational means available for sustainable innovations to be implemented.

Moreover, it’s important that the value chain of innovations is adapted to the company and then

followed in a quite strict way. This will help the ideas generated in the first phases to actually take place and stay long-term. Another suggestion to be made to managers is to use green marketing responsibly. This seems obvious but it's essential that every company does its part to not exaggerate with claims aiming just at the profits and not corresponding to reality, also in order to allow consumers to make conscious choices that really correspond to their desires.

4.2 Future research and limitations

This said, for further research, it would be interesting to consider other companies different in dimension, country, or culture, and see if the theory also applies to them or what is not the same. It would also be useful to study whether the culture of the country in which the company is, changes the way sustainability and in turn, sustainable innovations are seen and applied. Future research could also focus on other industries, to understand if sustainable innovations have similar reasons, steps, and returns to those of the food businesses.

A limitation of this study is that the study only analyzed one company.

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