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**The implementation of sustainability standards within the agri-food
chain: study of wheat sustainable sourcing in biscuits producing
companies.**

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Abstract

This thesis proposes to study the implementation of sustainable sourcing within agri-food businesses, and more precisely companies which produce cakes and biscuits and source wheat as a primary raw material. Agriculture has a strong impact on the environment and agri-food businesses have a key role to play in this context. Agri-food businesses, choosing which food to make available and to promote, are challenged to translate scientific concepts of sustainable agriculture into organizational processes within the company. We chose to focus particularly on private sustainability standards within biscuits and cakes companies who source wheat; and set up as a geographical background France and Italy. The research findings indicate that a cross functional approach is needed for a sustainable sourcing to be successful; involving internal and external stakeholders, regulated by strong governance mechanisms. By defining their own private standards, agri-food companies choose an approach of sustainable agriculture; and the implementation of those standards contributes to a profound change in the sector. Finally, a strong communication and recognition of context in the relationship between the company and the suppliers is a critical factor to the success of the program.

Résumé

Ce mémoire se propose d'étudier la mise en place de filière d'approvisionnement responsable au sein des entreprises agro-alimentaires, et plus particulièrement des entreprises productrices de biscuits et de gâteaux qui s'approvisionnent donc en blé. Cela fait suite au constat que l'agriculture a un impact important sur l'environnement et que les entreprises agroalimentaires ont un rôle clé à jouer du fait de leur position. Ainsi, les entreprises agroalimentaires se retrouvent confrontées au défi de "traduire" les concepts scientifiques d'agriculture durable en processus organisationnels au sein de l'entreprise pour répondre à ce challenge qu'est le changement climatique. L'étude porte sur la mise en place de standards privés au sein des entreprises productrices de biscuits et gâteaux et qui s'approvisionnent en blé ; et nous avons choisi comme contexte géographique la France et l'Italie. Les résultats de la recherche indiquent qu'une approche transversale est nécessaire à la mise en œuvre d'un programme d'approvisionnement durable ; impliquant des acteurs internes et externes à l'entreprise. En définissant leurs propres standards privés, les entreprises agro-alimentaires choisissent une certaine approche de l'agriculture durable, et contribuent ainsi à un changement profond de la filière. Enfin, la communication accrue entre les entreprises et les fournisseurs et la reconnaissance des différences de contexte sont des facteurs critiques au succès du programme.

Riassunto

Questa tesi si propone di studiare l'implementazione di filiere di approvvigionamento sostenibile nelle imprese agro-alimentari, e più precisamente nelle imprese che producono biscotti e dolci e che si forniscono in grano tenero. Quest'analisi fa seguito al riconoscimento dell'impatto significativo dell'agricoltura sull'ambiente e del fatto che le imprese agro-alimentari hanno un ruolo capitale da svolgere grazie alla loro posizione. Di conseguenza, le imprese agro-alimentari, che operano come intermediari tra gli attori dell'agricoltura e gli consumatori, sono confrontate alla sfida di tradurre i concetti scientifici dell'agricoltura sostenibile in processi organizzazionali. L'analisi porta sull'implementazione degli standards privati nelle imprese che producono biscotti e dolci e che si forniscono in grano tenero ; e abbiamo scelto come contesto geografico la Francia e l'Italia. I risultati della ricerca indicano che un'approccio trasversale è necessario alla formalizzazione di un programma d'approvvigionamento sostenibile ; coinvolgendo attori interni e esterni all'impresa. Definendo i propri standards privati, le imprese agro-alimentari scelgono un approccio dell'agricoltura sostenibile, e contribuiscono ad un cambiamento profondo della filiera. Per finire, la comunicazione tra imprese e fornitori e la riconoscenza delle differenze di contesti sono fattori critici al successo del programma.

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Introduction

In the past decades, awareness of the environmental impacts of agriculture has raised. Agriculture accounts for 10-15% of global anthropogenic emissions (Baumert et al., 2005; Smith et al. 2007), accelerating the phenomenon of climate change. Including the indirect sources (mainly land use change, including deforestation), this percentage increases to more than 30% (Bellarby et al., 2008). Agriculture also has a significant impact on biodiversity: globally, over 4000 assessed plant and animal species are threatened by agricultural intensification (Reid, 2017).

Agri-food businesses, choosing which food to make available and to promote, are a powerful actor in addressing climate change and redesigning an environmentally friendly and sustainable food system. As they source raw materials before processing and selling them, agri-food businesses can have a strong influence on farming methods. From this observation, several questions arise: what is a company's scope of responsibility, is it responsible for its supply chain? And most of all, what does sustainable means for sourced products? Many research papers have treated the subject of sustainable agriculture, opposing different ideologies (organic, integrated or regenerative agriculture, or permaculture), and the definition of sustainable sourcing is still subject to a heated debate between agronomists. On the other hand, corporate world, across all industries, has also been using exponentially the term of "sustainability": many companies have been communicating on their sustainability policies, issuing statements and taking commitments.

The aim of this thesis is to bridge the gap between the scientific definition of sustainable agriculture and its translation into organizational mechanisms within the companies. Thus, this thesis will study what instruments an agri-food company has at its disposal once it acknowledged the impact that agriculture can have on the environment. Although literature has been prolific on the definition of sustainable agriculture; only few authors explore how companies should appropriate those terms and translate them into organizational processes. Therefore, the research will focus mainly on private standards as an instrument of sustainability operationalization, in order to give understandable instruments to agri-food companies to translate the complex term of sustainable agriculture and sustainability into concrete action within the organizational and corporate contexts.

Therefore, we will first give an overview of the links and interdependencies that exist between climate and agriculture, and we will explore the role of agri-food companies in this context. Following the findings of this first chapter, we will discuss on the definition of sustainable agriculture, comparing different approaches and exploring the debate that exist in the scientific

literature. This will lead us to understand how companies can translate these scientific concepts in organizational policies. This thesis will focus on understanding what form sustainable sourcing programs take, who are the stakeholders involved in this process, and which governance mechanisms exist between these stakeholders.

At the light of those elements, we chose to focus our study on wheat sourcing. Cereals have a significant strategic and economic importance since it still represents 50% of world daily caloric intake. In terms of environmental sustainability, wheat production is particularly affected by climate change and has to find ways to adapt (Enghiad et al, 2017). To answer those challenges, some innovative initiatives have developed, involving cereal farmers, researchers, and private and public institutions. Therefore, we chose to focus on a single raw material and study the process of wheat sourcing within the companies that produce biscuits and cakes. France and Italy presented an interesting geographical context, as both countries are significant producers and consumers of wheat, but present systemic differences in the organization of their wheat chain. Due to the state of literature on the subject, our research is exploratory; therefore, we chose case study as a research methodology, which helped us to draw significant conclusions on the subject. Through the study of four different cases that we will expose later, this thesis identifies good practices and success factors to implement a sustainable sourcing program within a company.

1. Shift to sustainable sourcing: an urgent necessity for agri-food companies

1.1 Climate change and agriculture are closely linked and interdependent

The environmental impacts of the current farming methods have been discussed many times in scientific literature, from various angles. The aim of the following part is to give an overview of the existing interactions between agriculture and climate change, in order to understand (1) the basics of environmental science to be able to have a comprehensive appreciation of the challenges of sustainable agriculture and (2) what is the role of agri-food companies in this context.

1.1.1 Impacts of agriculture on climate change

In the following part, climate change refers to: *a broad array of alterations in climatic and weather conditions characterized by shifts in average conditions and in the frequency and severity of extreme conditions* (CGIAR research program on climate change and agriculture, 2019).

The greenhouse effect is the term commonly used to describe *the natural process through which atmosphere gases absorb and re-radiate infrared radiation from the earth's surface, and which is largely responsible for life on earth*. It is generally accepted that human activities are altering the composition of gases in the atmosphere, which could cause heat that would normally be radiated out to be retained (Eurostat, 2015).

Agriculture refers to *the science or practice of farming, including growing crops and raising animals for the production of food, fiber, fuel and other products* (CGIAR research program on climate change and agriculture, 2019).

Population pressure, technological change, public policies, and economic growth and the cost/price squeeze have been the main drivers of change in the agricultural sector during the last four decades. **This growth, however, has been at the expense of increased pressure on the environment, and depletion of natural resources** (IPCC, 2007).

Agricultural production systems are associated with a series of interconnected natural resource management challenges. The main impacts of agriculture on environment are listed below:

(1) Emissions of GHGs

According to the given definition of the agricultural sector, it causes 10-15% of global anthropogenic emissions (Baumert et al., 2005; Smith et al. 2007). Including the indirect sources (mainly land-use change, which includes deforestation), this percentage increases to more than 30% (Bellarby et al., 2008).

On a regional level, the agricultural sector accounted for about 9% of the EU's total GHG emissions in 2015 (see Figure 1). This can be explained by the fact that agriculture plays a less prominent role (if measured in GDP shares) in Europe than globally.

In France, agriculture is responsible for 21% of greenhouse gas emissions; whereas in Italy it accounts for only 7% (Eurostat, 2015).

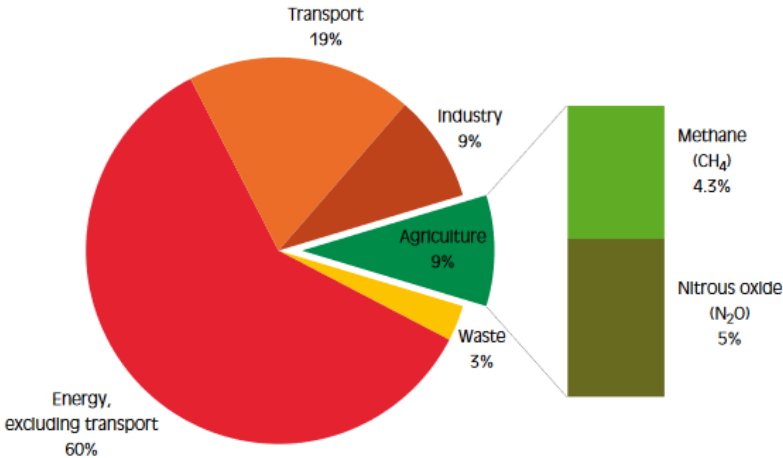


Figure 1 - Share of the GHG emissions of the agricultural sector in total EU-28 emissions in 2015 (Source: Eurostat, 2015)

Agricultural practices are each associated with certain emissions. Typical direct emissions are methane and nitrous oxide. In addition, CO₂ is directly released because of agricultural activities. As a matter of fact, agricultural sector is responsible for **70% of global nitrous oxide emissions** and **50% of global methane emissions** (FNH, 2010). These non-carbon GHGs have more powerful greenhouse effects and have greater longevity than carbon dioxide. To be able to compare the different sources of emissions coming from agriculture, emissions of different GHGs are expressed in equivalent CO₂ (CO₂eq). The different sources of GHGs and the role of the agricultural sector are presented in Figure 2.

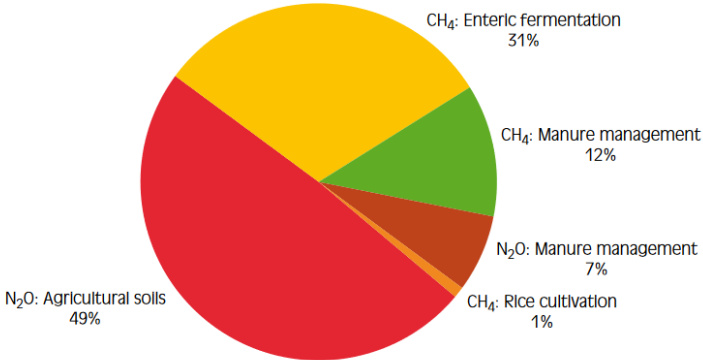


Figure 2 - GHG emissions of the agricultural sector for EU-28 in 2015 (Source: Eurostat, 2015)

As underlined in figure 2, the biggest source of agricultural GHGs emissions is **nitrous oxide** (N₂O). N₂O is generated by natural biogenic processes, but output is enhanced by agriculture through nitrogen fertilizers, the creation of crop residues, and animal urines (FAO, 2003). N₂O formation is sensitive to climate, soil type, tillage practices and type and placement of fertilizers. Better on farm fertilizer management, improved conservation tillage, wider regulatory measures and economic incentives for balanced fertilizer use and reduced GHG emissions, together with technological improvements such as more cost-effective slow-release formulations should reduce these losses in the future. Better managing grazing lands – such as by rotational grazing and altering forage composition are also effective to reduce N₂O emissions. (FAO, 2003). As a matter of fact, emissions of N₂O from agricultural source decreased by 17% in the European Union between 1990 and 2015, largely due to a general lower use of nitrogen fertilizer on farmland in most of the Member States during this period. (Eurostat, 2015).

The second greenhouse gas most emitted by agriculture is **methane** (CH₄), which is a principal GHG driving climate change. Its warming potential is about 20 times more powerful than carbon dioxide. CH₄ is produced when organic materials decompose in oxygen-deprived conditions, notably from enteric digestion by ruminant livestock, from stored manures and from rice grown under flooded conditions. Around 10% of global methane emissions comes from livestock, from enteric fermentation by cattle, sheep and goats and from animal excreta (FAO, 2003). At the European Union level, France is the largest emitter of methane from enteric fermentation, accounting for 18% of all EU-28 emissions of CH₄ in 2015. Differences between countries are generally due to types of livestock and their numbers as well as factors such as climatic and stock feed differences (ibidem).

Finally, **carbon dioxide** (CO₂) is released largely from microbial decay or burning of plant litter and soil organic matter (IPCC, 2007).

Agricultural greenhouse gases fluxes are complex and heterogeneous, but the active management of agricultural systems offer possibilities for mitigation. Many of these mitigation opportunities use current technologies and can be implemented immediately (IPCC, 2007).

(2) Land degradation

Soil constitutes a prime source which regenerates slowly but is likely to be damaged in a very short amount of time (Murua and Laajimi, 1995). FAO's prospect indicates that 80% of the additional food production necessary to meet the needs of 2050 will have to come from lands

already being cultivated. This is why it is extremely important to maintain the quality of arable lands. (FAO, 2014). Yet, lands are largely affected today by erosion, compaction, acidification and salinization, which are a result of pesticide and herbicide applications, excessive fertilization, and loss of organic matter; and climate change is likely to exacerbate land degradation and desertification (CCAFS, 2012). In a long term perspective, the intensive use of chemical fertilizers causes the loss of organic matter within the soils, and thus moisture retention becomes difficult (Murua and Laajmi, 1995). According to the FAO, half of the topsoil has been lost in the last 150 years.

Soil degradation can be mitigated by responsible farming practices: for example, vegetation cover prevents soil erosion and ensures soil fertility through natural biological processes such as nitrogen fixation (FAO, 2017).

(3) Use of water

Water is considered as the most critical resource for sustainable agricultural development worldwide. **Agriculture accounts for around 70% of freshwater demand and impacts water quality**(CCAFS, 2012).

The efficiency of irrigation is very low, since less than 65% of the applied water is actually used by the crops (Chartzoulakis and Bertaki, 2015). Moreover, excessive use of fertilizers and pesticides in water catchment areas can pollute waterways and aquifers, damage to water bodies and aquatic systems.

Better water management usually refers to improvement of water allocation and/or irrigation water efficiency. Better agricultural practices, such as soil management, irrigation and fertilizer application and disease and pest control are associated to a more sustainable water management in agriculture (Chartzoulakis and Bertaki, 2015).

(4) Loss of biodiversity

Each ecosystem is characterized by complex relationships between living components such as plants and animals and nonliving components such as soil, air and water. Biodiversity and ecosystem services are essential in supporting agriculture in multiple ways and at all levels; however, agriculture is the largest contributor to biodiversity loss. (Dudley and Alexander, 2017) Agriculture destroys biodiversity by converting natural habitats to intensely managed systems and by releasing pollutants, including greenhouse gases. Food value chains further amplify impacts on biodiversity through energy use, transport and waste.

Knowledge of the relationship between agriculture and biodiversity has greatly improved with data from recent studies: globally, **over 4000 assessed plant and animal species are threatened by agricultural intensification**, and the numbers are still rising(Reid, 2017). Over

1000 (87%) of a total of 1226 bird species are impacted by agriculture and the European Commission declares that an estimated 80% of the original forest that covered the Earth 8,000 years ago has been cleared, damaged or fragmented, with much of this attributed to agriculture. At a community level, farmers can act to mitigate the impact of agriculture on biodiversity: one approach is for farmers to leave areas of land untouched. For example, neighbouring farmers might be encouraged to protect adjacent areas of their farms, so that 'wildlife corridors' that connect natural habitats are maintained. Or farmers might allow uncultivated areas to exist around, and within, cultivated ones. This would allow grasses and other wild plants grow in order to control soil erosion and encourage pollinators and beneficial insects. Using such measures on land that connects natural areas can go a long way towards conserving biodiversity (Gemmill and Varela, 2004).

Unquestionably, global change will cause compromises for crops and cropping systems.

The way food is produced today increases the effects and the rapidity of climate change. However, there is a large potential for reducing net food system emissions, per unit of food consumed as well as in absolute terms through efficiency measures in production.

1.1.2 Effects of climate change on agriculture

Climate is the primary determinant of agricultural productivity (Adam et al., 1998) and thus, clear impacts from climate change are already being witnessed in agriculture (Khanal, 2009). Agriculture is highly sensitive to climate, both in terms of longer-term trends in the average conditions of rainfall and temperature, which determine the global distribution of food crops, but also in terms of interannual variability and the occurrence of droughts, floods, heat waves, frosts and other extreme events (CCAFS, 2012).

Those effects can be both positive and negative: for example, rises in temperature would help to grow crops in high altitude areas and toward the pole. On the other hand, there have already been noticeable impacts on plant production, insect, disease, and soil properties. Some regions, such as Australia, Africa, Central America and Central Asia are expected to be more vulnerable than others; whereas in Canada and the North of the USA yield crop is expected to rise (Fondation pour la Nature et l'homme, 2010).

However, there is still much that is not known, and there are many uncertainties in future climate trajectories, generated by complicated feedback loops and by potential tipping points in the climate system (CCAFS, 2012). In any case, current agricultural models are expected to change and adapt to the coming climate challenges.

1.1.3 Agriculture: a way to mitigate climate change

The FNH (2010) underlines that agriculture is one of the only activities that has actually the potential to mitigate global warming in the coming years, **by storing carbon in the soil.**

The term **carbon sequestration** is used in scientific literature to describe both natural and deliberate processes by which CO₂ is either removed from the atmosphere or diverted from emission sources and stored in the ocean, terrestrial environments (vegetation, soils and sediments) and geologic formations. Terrestrial sequestration is typically accomplished through forest and soil conservation practices that enhance the storage of carbon (such as restoring and establishing new forests, wetlands and grasslands) or reduce CO₂ emissions (such as reducing **agricultural tillage**) (USGS, 2008).

Therefore, agriculture is both part of the problem and part of the solution to climate change (CCAFS, 2012). **As a consequence, food and agriculture stand at a crossroad (FAO, 2018) and the path ahead is clearly marked by sustainability.**

In the next part, we will focus on one of the main stakeholders of the food chain and its responsibility in terms of agriculture and climate change mitigation: agri-food businesses.

1.2 Food businesses: key actors of the agri-food chain

1.2.1 The position of food businesses within the agri-food chain: a privileged position to take action against climate change

The **agri-food system** can be defined as: “*an interdependent set of institutions, firms and markets contributing to the production, processing and distribution of agricultural products to satisfy nutritional needs of a society of people*” (Caizza and Volpe, 2014). This system involves agricultural, industrial and service firms operating in multiple sub-systems of products such as fish, milk, oil, fruits and vegetables (see Figure 3). Within each sub-system, the processes that take an agricultural product from the initial stage of production to the final consumer consist of numerous activities and actors organized within a complex chain (ibidem).

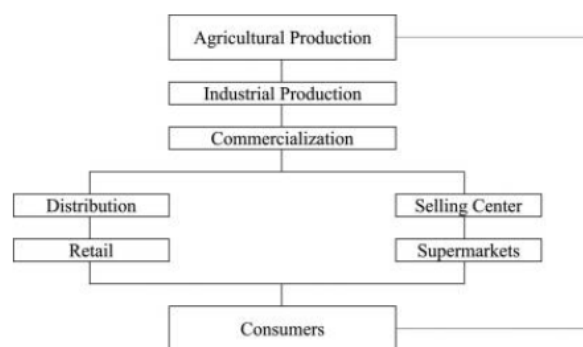


Figure 3- Actors of the agri-food systems (Source: Caizza and Volpe, 2014)

In this thesis, we chose to focus on the food businesses.

Their role as a powerful actor in addressing climate change and redesigning an environmentally friendly and sustainable food system (Sodano, 2013) has been underlined several times in the scientific literature. In today's global food governance, private actors, in particular corporations, play a larger role than ever before (Sodano, 2013). They have become rule-setters rather than rule takers and are deciding, implementing, monitoring and enforcing rules and regulations to an increasing extent (Fuchs, 2009). Food businesses influence the whole supply chain by choosing which foods to make available and promote: they have de facto become a key part of the fabric of global environmental governance. In their role as investors, polluters, experts, manufacturers, lobbyists and employers, they are central players in the environmental issues (Sodano, 2013).

1.2.2 Environmental responsibility of private companies: emerging of CSR policies within food businesses

Notion of business responsibility and CSR

The idea that businesses may have a responsibility towards environment is not new but has been recently gaining momentum with the acceleration of visible impacts of climate change and pressure from the consumers. Through the years, two conceptions of business responsibility faced each other: on one hand, Drucker (1954), and more recently Mintzberg (2004) defend the idea that businesses, with their voice and power, must assume responsibilities towards social stakes; whereas Levitt (1958), backed in 1962 by Friedman, object that the only responsibility of businesses is to make profit.

This idea of business responsibility is embodied in the rise of "Corporate and social responsibility" (CSR) policies.

Even though the concept of CSR has gained a prominent position in general management literature (de Bakker/Groenewegen/Den Hond: 2005), there is still uncertainty about an adequate definition (Dahlsrud, 2006). Carroll (1999) catalogues 25 different definitions of CSR in the literature. Similar terms, e.g. corporate citizenship, accountability or good corporate governance, are often used synonymously (Hiss, 2006). Nevertheless, a multi-stakeholder dialogue conducted by the EU has concluded that CSR can be defined as a concept that on a voluntary basis integrates social and environmental demands into business operations and the interrelationship with stakeholders of enterprises (European Commission: 2001). In a very similar way, the World Business Council on Sustainable Development (WBCSD) defines CSR as a concept that embraces "the integration of social and environmental values within a company's core business operations and to the engagement with stakeholders to improve the well-being of

society”(WBCSD, 2002). Unlike most definitions of CSR, the definitions of the European Commission and the WBCSD take environmental topics into consideration. Since we underlined earlier that environmental issues are crucial for the agri-food chain, we follow this broader approach according to which **CSR means the responsibility of an enterprise for the effects of its business operations on the environment, its employees and society.**

Agri-food corporations rapidly adopted the term of sustainability and incorporated CSR in their strategy plans. About 80 percent of the world’s largest 250 companies report on their social and environmental performance, up from about 50 percent in 2005 (KPMG 2008). The concept has also recently begun to appear in the literature of business disciplines such as operations and supply chain management (Carter and Rogers, 2008). 80% of these reports discuss supply chain related issues (KPMG, 2005).

Other than environmental issues, product safety, nutritional responsibility, occupational welfare, animal health and welfare, local market presence and economic responsibility have been identified as core issues in the CSR strategies of agri-food companies (Formann-Hugg et al., 2013); but as stated above we will focus in this thesis on the environmental impacts of food businesses.

Scope of businesses responsibility

Companies do not work in isolation but are closely linked to their competitive environments and to the dynamic chains and networks of different types of actors (Forsmann-Hugg et al., 2013). As a matter of fact, one of the most challenging aspects is that **the boundary of responsibility often extends beyond the reach of a corporation’s ownership and direct control** (Faruk et al., 2002). Firms have recognized the need to develop strategies that extend their traditional corporate governance processes beyond the firms’ boundary to their supply chain partners (Kytte and Ruggie, 2005). **The most visible indicator of this extension is the emergence of corporate social responsibility-oriented purchasing strategies**, such as laying down standards that suppliers must meet in order to win business (Keating et al., 2008).

“A company is no more sustainable than its supply chain”

The production of a food item usually includes several raw materials or ingredient supply chains, where many sub-processes take place in several companies. (Forsman-Hugg et al., 2013) Studies by Katajajuuri et al. (2005), among others, have shown that a significant share of total environmental impacts in the food chain often results from agricultural production and not the manufacturing process of the final product. **For a food product or an ingredient to be produced in a responsible way, the entire supply chain must take account of the impacts of its actions on environment. Thus, a company is no more sustainable than its supply chain. – that is, a**

company is no more sustainable than the suppliers that are selected and retained by the company(Krause et al., 2009). As a matter of fact, the goods and the services procured, and action or the lack of actions by purchasing professionals, have a direct influence on the natural environment.

To summarize, food production and current farming methods have a significant impact on the environment and can contribute to the acceleration of climate change. Agri-food businesses, intended as companies who buy raw materials and food products, can therefore act as gatekeepers as they choose which foods to make available and promote to the consumers. Once a company has acknowledged this assertion, what does the term “sustainable” really means and how can it translate into a purchasing program? Thereafter, we will attempt to understand of what a sustainable food product means and identify what instruments food companies have at their disposal to implement sustainable sourcing in their food chain.

1.3. How to define sustainability in food supply chain

Once stated that agri-food companies can have a significant positive impact on the environment provided that they source sustainable products, we need to explore what sustainable sourcing means. Scientific literature has been prolific on the subject: therefore, the aim of this part is not to give a precise definition of sustainable sourcing, but to identify key takeaways within the debates around sustainability definition which would give us precise inputs for the rest of our study.

1.3.1. General definition of sustainability

According to Gimenez (2012), the most widely-adopted definition of sustainability is that of the World Commission on Environment and Development (1987, p.8): *“development that meet the needs of the present without compromising the ability of future generations to meet their needs”*. This definition was underlined in the Bruntland report (1987) and the line of thought on sustainable development has been built on this first definition.

Unfortunately, this macroeconomic definition is difficult for companies to apply and provides little guidance for organizations (Hart, 1995). The following part is an attempt to give a framework understandable by companies and organizations to implement a sustainable supply chain.

1.3.2. Sustainable supply chain: terms definition and challenges

From supply chain management to sustainable supply chain management

Since “a company is no more sustainable than its supply chain” (Krause et al., 2009), supply chain management is insufficient; instead, sustainable supply chain must become the norm (Seuring and Muller, 2008).

Sustainable development and supply chain management are two concepts that, independently, have generated a lot of research over the last decade (Krause et al., 2009). The topic of sustainability in the supply chain take several labels in the literature including **green supply chain** (Bowen, Cousins, Laming and Faruk 2001), **sustainable supply chain management** (Carter and Jennings 2002, Carter 2004) or **closed loop supply chain** (Seitz and Peattie 2004) just to name a few.

Mentzer et al. (2002, p.18) define **supply chain management** as “*the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole*”. In this definition, the term of coordination between traditional business functions for an improvement of the long-term performance appear as important.

Based on this definition, Seuring and Muller define **sustainable supply chain management** (SSCM) as “*the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development into account which are derived from customer and stakeholder requirements*”.

Finally, Pagell and Wu (2009, p.38) assert that to be truly sustainable, a supply chain “*would at worst do no net harm to natural or social systems while still producing a profit over an extended period of time*”. They add to the definition the concept of **external stakeholders** (defined as natural or social systems).

1.3.3. Importance of purchasing functions

Each organization is only as sustainable as its upstream supply chain (Schneider and Wallenburg, 2012). A direct implication of that premise is that **boundary spanning functions such as purchasing are central to a company’s sustainable development efforts**.

Traditionally, the purchasing function has been regarded as a support service, with a limited part to play in achieving a company’s corporate goal; but empirical studies suggest that this traditional role is being subjected to further re-evaluation in the light of the drive towards better environmental management (Schneider and Wallenburg, 2012). Firms used to respond to

environmental pressures with compliance with regulation and legislation, but the role of purchasing and supply chain management is more goes further, and those departments have an increasing role to play in companies CSR strategies.

In other words, **companies aiming for corporate sustainability, therefore, must involve their suppliers and establish environmental standards for supplier performances.** Consequently, corporate sustainability necessarily involves the implementation of sustainable sourcing by the purchasing function. (ibidem)

1.3.5. Need for sustainably produced food products: tentative to define sustainable agriculture

As stated, **companies aiming for corporate sustainability, must involve their suppliers and establish environmental standards for supplier performances** (Schneider and Wallenburg, 2012). Therefore, it is necessary to understand what sustainable agriculture is in order to translate a complex definition into standards intelligible by agri-food companies, to give some directions and instruments to source environmentally friendly products.

Agriculture itself is a form of biotechnology as agriculture harnesses specific plants and animals in energy transfer systems. However, modern biotechnology represented a more sophisticated set of developments that include genetic engineering and advances culture techniques. The available technology had tremendous potential to increase output, **but also with the power to adversely affect environment** (Robinson, 2009)

Definition of conventional agriculture

In Western economies, several agriculture models coexist (G. Plumecocq et al., 2018). Intensive agriculture organization, which has increased yields while causing major pollution and resource depletion, competes with alternative models, which tackle these sustainability issues and lead to lower yields.

Sustainable agriculture is often described by its contrast with **conventional agriculture**. In fact, the term of conventional agriculture itself was developed to clarify and justify alternative approaches to agriculture.

Knorr and Watkins (1984) give the main characteristics of **conventional agriculture** as follows: *capital intensive, large scale, highly mechanized agriculture with monocultures of crops and extensive use of artificial fertilizers, herbicides and pesticides, with intensive animal husbandry.*

Muruam and Laajmi (1995) complete this definition by identifying the purpose of conventional agriculture: *increasing productivity in terms of output per unit of utilized land or utilized labor.*

Theoretical approach of sustainable agriculture

In scientific literature, **sustainable agriculture** has been described as an umbrella term encompassing several ideological approaches (including organic, low-input, permaculture, agroecology, etc), and as a matter of fact the question of the definition of the term sustainable has been debated over and over and scientific literature has been prolific on the subject. (Murua and Laajmi, 1995) As a consequence, it is even harder to give a proper definition of what sustainable agriculture is.

In this paper, we select three definitions which cover different aspects of this debate.

- According to MacRae et al. (1989), sustainable agriculture comprises management procedures that work with natural processes to conserve all resources, minimize waste and environmental impact, prevent problems and promote agroecosystem resilience, self-regulation, evolution and sustained production for the nourishment and fulfillment of all.
- Murua and Laajmi(1995)take up the idea that agriculture must meet the required food production **in a continuous and profitable way**, without damaging natural resources and environmental quality, but they add to the definition the idea that **sustainability must include an increase in agricultural production**. Every system of alternative agriculture must be profitable, otherwise it would not be able to meet its social responsibility: providing an adequate living standard to farmers. However, profitability does not imply short-term profit maximization. The farmer has to be conscious of economic and environmental objectives. Thus, the economic dimension has significant weight in this definition.
- Finally, Nelson (2007) gives the following definition of sustainable agriculture: systems and cropping strategies that are economically viable, environmentally sound and socially acceptable, with a goal of **intergenerational equality** by meeting the needs of the present while leaving equal or better opportunities for the future. Consequently, Nelson adds a time lapse dimension to this definition.

Those three definitions define a global holistic approach that sustainable agriculture respect: a sustainable agriculture preserves natural resources in a long-term perspective and is at the same time economically viable. This underlying philosophy is reflected in many farming models, some of them will be detailed below.

1.3.6. Specific examples of sustainable agriculture

The alternative approaches to conventional agriculture include organic agriculture, regenerative agriculture, permaculture, biodynamics, agroecology, low-input agriculture, and others (Buttel et

al., 1986). Although there are differences among these various agricultural approaches, they nonetheless appear to have much in common including a shared underlying philosophy (Lockeretz, 1986). Essentially, all alternative agriculturalists favor significantly reduced use of synthetic farm chemicals. Most alternative agriculturalists, however, see their goals as much broader than merely reducing agricultural chemical use. Additionally, alternative agriculturalists advocate smaller farm units and technology, reduced energy use, greater farm and regional self-sufficiency, minimally processed foodstuffs, conservation of finite resources, and more direct sales to consumers (Buttel et al. 1986; Lockeretz 1986). The underlying philosophy of sustainable agriculture can be declined in many models: we chose to focus below on organic farming, integrated agriculture, regenerative agriculture and permaculture.

(1) **Organic agriculture:**

Approach and principles of organic farming

Organic farming pre-dates all other approaches to “environmentally-friendly” agriculture (Scofield, 1986). According to the FAO definition, organic agriculture is *“a system that relies on ecosystem management rather than external agricultural inputs. It is a system that begins to consider potential environmental and social impacts by eliminating the use of synthetic inputs, such as synthetic fertilizers and pesticides, veterinary drugs, genetically modified seeds and breeds, preservatives, additives and irradiation. These are replaced with site-specific management practices that maintain and increase long-term soil fertility and prevent pest and diseases.”*

Organic food production is the fastest growing agriculture industry in much of the developed world, mainly due to concerns with pesticides and interests in the environment and food safety. (Rigby and Caceres, 2001). Certified organic products are those which have been produced, stored, processed, handled and marketed in accordance with precise technical specifications, and certified as “organic” by a certification body. We will explore in the next chapter how organic certification works in the EU.

History and regulation

One of the aspects of organic production which separates it from many of the other alternative agricultural movements is that it has a history of regulation (Rigby and Caceres, 2001). In fact, organic farming practices are unique, for they are the only ones codified as a law. Although there are differences in these standards between various organic bodies and across national boundaries, these clearly defined standards represent a foundation on which debate can be based (ibidem).

Controversy linked to organic agriculture

Although it regards a small number of farmers, organic agriculture has always been the subject of a **heated debate and contrasted standpoints**. It has a very positive image within the consumers,

and it is a sector which is expanding particularly rapidly (Gautronneau, 1997). Within agronomic research environments, many agronomists are irritated by the rapid development of the organic certified products, as they deem that organic is not the correct answer to the fundamental issues current agriculture is facing (ibidem).

According to Nelson (2007), much of the public assumes organic agriculture is sustainable, but that is not always the case and cannot be assured. For some, organic is synonymous of sustainable, for others, equating them is misleading. Pretty (1995, p.9) argues that although "organic agriculture is generally a form of sustainable agriculture", it can also have negative environmental effects. This includes for example the leaching of nitrates from field under legumes, the volatilization of ammonia from livestock waste and the accumulation of heavy metals in soil.

(2) Integrated agriculture (or low-input agriculture)

Integrated agriculture is based on a reduction – but not necessarily elimination- of chemical fertilizers, insecticides and herbicides. Farmers are adopting these practices primarily to reduce costs, but also because they want to minimize impact on the environment or because they perceive future pesticide regulations (Diver, 2016). Although there is no low-input label and therefore no precise framework to respect, low-input farming methods includes rotations, crop and livestock diversification, soil and water conserving practices, mechanical cultivation, and biological pest controls. Integrated agriculture is considered by many specialists as a step towards organic agriculture (Diver, 2016)

(3) Regenerative agriculture and permaculture

Regenerative agriculture and permaculture are more conceptually oriented than methods-based (Diver, 2016).

Regenerative agriculture builds on nature's own inherent capacity to cope with pests, enhance soil fertility and increase productivity. It implies a continuing ability to re- create the resources that the system requires. In practice, regenerative agriculture uses low-input and organic farming systems as a framework to achieve these goals (Diver, 2016). Regenerative farming methods are based on the idea that soil should be tilled as less as possible to preserve ecosystem, and this involves the use of chemical products in necessary cases; whereas organic farming is based on the ban of chemical products, even if it involves tilling the soils more. However, the frontier between organic and regenerative farming methods is not so clear anymore as more and more organic farmers try to include regenerative principles in their farming methods and vice versa.

Permaculture is a contraction of "permanent agriculture" and was coined by Bill Mollison, an Australian forest ecologist, in 1978. Permaculture is concerned with designing ecological human habitats and food production systems, and follows specific guidelines and principles in the design

of these systems. To the extent that permaculture is not a production system, per se, but rather a land use planning philosophy, it is not limited to a specific method of production. Thus, practically any site- specific ecological farming system is amenable to permaculture. (Diver, 2016)

Among the multiple definitions of sustainable agriculture and the above farming methods we described, we can identify the following common characteristics (Neher, 1992):

- The preservation of the productive capacity of the land resource
- The pollution of surface and ground water resources due to transport of chemical fertilizers from
- Loss of species' habitat and reduction in biological diversity. Natural resources should not be placed at risk by agricultural activities which are not environmentally friendly.
- The consideration for the effect of agriculture on the natural environment beyond the farm gate and apart from the productivity of cropland.

1.3.7. Discussion on a single definition of sustainable agriculture

To date, there has been no universal base or common denominator, such as currency, to allow quantification of the environmental or social values that permit direct comparison with economic return. It has been claimed that this multitude of different and partially opposing definitions has made the realization of sustainable agriculture a fuzzy affair and caused confusion by exacerbating differences in the views of different stakeholder groups. According to Velten et al. (2015), any attempt to try and find a single all-encompassing definition is doomed to failure. Due to the complex and contested nature of the notion of sustainable agriculture, and its adaptation to context, its precise and absolute definition is impossible. However, there is no way to streamline the concept. The fact that the concept is vague and ambiguous in its meaning renders its use and implementation extremely difficult (Velten et al., 2015)

Attempting to arrive at a more precise, operational definition of sustainable agriculture is extremely problematic, partly because there is such a range and number of parties involved in the debate. (Rigby and Caceres, 2001) This is not surprising, as there would appear to be little point in advocating a non-sustainable agriculture, and so all relevant groups are fighting it out in the sustainable camp. Therefore, the debate over how to achieve sustainability is plagued by fundamental disputes and disagreements over which elements of production are acceptable and which are not. Moreover, it is extremely difficult to determine whether certain agricultural practices are sustainable or not. It is only in retrospect that sustainable techniques can be truly identified. What is a sustainable technique will vary both temporally and spatially. It is not simply a question of tools and inputs, but the context in which they are used. (Rigby and Caceres, 2001).

Despite this dilemma, the land manager and the policy maker are confronted by public demands to consider more than the production (economic) component.(Nelson, 2007).

To summarize the findings of this part, (1) we defined the principles and challenges of sustainable supply chain and (2) we went through the multiple definitions of sustainable agriculture to gain a better understanding of what criteria food companies should pay attention to when they source their raw materials. In the next part, we will explore the scientific literature which focus on the organizational process of sustainable sourcing to be able to build a framework for the implementation of sustainable sourcing in food companies

2. Instruments for agri-food company to implement sustainable sourcing

Although the advantages of sustainable sourcing have been highlighted repeatedly, its implementation in practice is often at low levels -if at all (EY, 2011). This gap between potential benefits and actual usage may be attributed to two factors: firstly, some companies may not be aware that sustainable sourcing constitutes an integral part of corporate sustainability and, as such, requires a systematic implementation. Secondly, others may lack the capabilities, instruments, or processes for its efficient introduction (ibidem). The role of this part is to transform abstract principles in a concrete strategy. **The switch from abstract models to concrete references, needs an operation of “translation”** (Landais, 1998). Landais also underlines that “managing means deliberately acting in the aim to influence a system of actions according to explicit objectives”. Therefore, this part aims to explore how agri-food systems can be managed to create a sustainable supply chain.

Several studies have sought to explain why private forms of value chain governance have become more common in recent years, what are the bargaining processes that have led to the arrangements we have today, and how those arrangements affect the actors in the value chain (Challies, 2012; Gereffi et al., 2005; Giovannucci and Ponte, 2005; Lee et al., 2012; Seuring and Müller, 2008). Yet little is known about **the underlying process and conditions under which green sourcing concerns lead to the adoption of particular types of sustainability instruments among agri-food companies** (Rueda et al., 2016).

The following chapter aims to study:

- (1) The stakeholders involved in the process of defining and implementing sustainability standard,
- (2) The instruments they have at their disposal to define and implement those criteria and some existing examples,
- (3) The governance mechanisms they can use to implement those criteria,
- (4) The control mechanisms food companies can use to make sure those sustainability criteria are implemented.

2.1. Stakeholders for the definition and implementation of sustainability criteria

2.1.1. Different types of stakeholders

Following the definition of stakeholders as “*any group or individual who can affect or is affected by the achievement of the organization’s objectives*” (Freeman, 1984, p.46), the drivers of sustainable sourcing mentioned above can also be considered as stakeholders of the purchasing function.

However, the purchasing department is in interaction “with a broad set of stakeholders, including buyers, suppliers, contractors, the community, and internal employees on most of the other functional areas of the company (Carter and Jennings, 2004, p. 146).

In the specific context of sustainable sourcing, salient stakeholders have been identified as the following groups: **(1) company-internal actors, (2) actors external to the company but internal to the supply chain and (3) supply chain external actors** (Chen and Paulraj, 2004), The three categories of stakeholders are detailed below.

(1) Company internal stakeholders. This category includes not only the purchasing function, but also corporate management. In fact, a typical purchasing function, whose objectives rely exclusively on cost, quality, and reliability, will most probably not feel the urgency to implement sustainable sourcing on its own accord; whereas corporate management, due to hierarchical power, oversees sustainability strategy. However, it is important to underline that corporate management only has a strong positive effect on the purchasing function to implement sustainable sourcing if there is a corporate sustainability strategy or a sustainability-oriented corporate culture. Marketing and sales also play a mediating role in relaying the effect of customers to the purchasing function to implement sustainable sourcing and to corporate management to adopt sustainability strategies (ibidem).

(2) Supply chain-internal stakeholders. Two main stakeholders are identified in this category: customers and suppliers. On one hand, customers have a strong positive effect on the purchasing function to implement sustainable sourcing and on corporate management to adopt sustainability strategies. On the other side of the supply chain, suppliers constitute an important stakeholder of purchasing: suppliers and their sustainability initiatives only have a positive effect on the purchasing function to implement sustainable sourcing and on corporate management to adopt sustainability strategies if they have strong supplier power. Due to long-term, strategic partnerships or a high dependence of the focal firm on single suppliers with strong market power, suppliers might be in position to influence sustainability strategies (ibidem).

(3) Supply chain-external stakeholders. This category of stakeholders includes competitors, regulatory authorities (which are one of the initial impulses for considering environmental aspects in sourcing), and NGOs (who influence corporate management, customers, suppliers or competitors to adopt sustainability strategies) (ibidem).

Schneider and Wallenburg (2012) assert that during implementing sustainable sourcing, purchasing has to cooperate more systemically and closely with other business functions, such as marketing and sales. **A good company-internal network is needed.**

This analysis is corroborated by EY's latest report, in which the consulting firm actually studied the implementation of responsible and resilient supply chains within a sample of 70 companies¹ and found out that for half of the concerned companies, procurement or supply chain function is the ownership of sustainability. For 25%, ownership falls under corporate sustainability team. Furthermore, EY underlines that **executive ownership is critical to establishing sustainability as a priority in an organization.**

EY (2011) identifies three different models of management of sustainable supply chain:

- (1) **Siloed model:** in this case, supply chain responsibility is segregated from core supply chain management. Sustainability criteria are developed and managed separately. In some cases, limited dialogue among functions occurs, but this is not formalized and often occurs on an ad hoc basis.
- (2) **Integrated model:** sustainability is embedded in procurement, category management and sourcing processes. Sustainability is weighted and considered along with traditional supply chain factors (price, quality). Programmatic integration of sustainability issues goes across business units (training, measurement, standards).
- (3) **Hybrid model:** in this case, sustainability function collaborates with procurement or supply chain to provide input in supply chain management process. Typically, sustainability function will establish strategy, governance and process. In many cases, a cross-functional working group will facilitate the collaboration.

The hybrid model is the most common model (it accounts for 39% of the studied companies according to EY's report). However, EY falls under Schneider and Wallenburg assertion and insist on the fact that a **cross-functional approach is needed.**

2.1.2 NGO/companies collaborations

EY (2011) underlines that working with international organizations, standard setters and NGOs is important in helping establish a longer-term vision, connect to megatrends in society, provide practical guidance and assist companies to prioritize their supply chain sustainability goals. The

¹ Respondents came from a wide range of companies, across industries and geographies.

number of voluntary sustainability standards for monitoring, measuring and tracking sustainability performance has grown rapidly in number and importance in global commodity markets. However, it can be challenging for companies to determine the appropriate standard or standard setting organizations to align with.

The examples of corporate-NGO partnerships are numerous: the Coca-Cola Company's partnership with WWF to help protect the world's seven most important fresh water river basins, Chiquita Brand's partnership with the Rainforest Alliance to grow bananas in a more environmentally friendly manner, McDonald's partnership with the Environmental Defense Fund to reduce the environmental impact of its packaging (Poret, 2014).

In practice, a company has several options for driving a sustainability program, depending on the level of the CSR process at which the NGO intervenes and the level of the partners' involvement (Poret, 2014).

First, **the relationship between an NGO and a firm may be limited to a communication campaign, which can be viewed as a co-branding operation.** WWF has established a significant co-branding program with its Panda logo. (Poret, 2014). Products must meet environmental and social criteria, and WWF requests an independent certification of products, such as WWF-accepted labels and certification systems.

Second, **an NGO may act as a monitoring agency to control the code of conduct implemented by a firm.**

The third option for a company is **the creation of a partnership with an NGO to develop a code of conduct or a specific standard.** This type of partnership implies three steps of construction: (1) the establishment of standards or "recognition", (2) the creation of evaluation mechanisms with independent enforcement or certification, (3) the recognition of the control party by an authoritative body or accreditation (de Boer, 2003).

Finally, **a firm may choose an existing well-established label that is owned by an NGO.** In this context, the firm must fully comply with the standards that are defined by the NGO. For instance, Unilever chose this strategy for its Ben and Jerry's brand, and adopted the Fairtrade label in Europe and the United States. Ben and Jerry's is committed to using only Fairtrade-certified ingredients by 2013 (Poret, 2014).

Therefore, corporations form partnerships with NGOs because NGOs promote societal actions, provide technical assistance, elaborate certification schemes, promote and design CSR standards as well as management and reporting processes, and participate in CSR monitoring and auditing.

2.2. Which instruments can companies use to define their sustainability criteria?

Once that the stakeholders have been identified, it is important to understand what instruments they have at their disposal to implement sustainable supply chains.

While national governments and international organizations were traditionally on charge of such regulation, for the past two- or three-decades private sector actors, such as branded processors, international traders and especially retailers, have played an increasingly powerful role (Ponte, 2013). New mechanisms of governance have also emerged, including private, industry and multi stakeholder standards and labels. New « hybrid » or « multi-partner » forms of social and environmental governance have emerged (Rueda, 2016).

2.2.1. Standards and certifications: terms definition

Standards, and related certification, are developed by a variety of public and private organizations, target variety of objectives and cover a variety of industrial activities (FAO,2011) Consequently, the **terminology is varied and rich and can lead to confusion.**

According to the ISO (2004), a standard is: *“A document established by consensus and approved by a recognized body, that provides for common and repeated use, rules, guidelines, or characteristics for activities or their results, aimed at the achievements of the optimum degree of order in a given context.”* It also notes that: *“Standards should be based on the consolidated results of science, technology and experience, and aimed at the promotion of optimum community benefits.”*

Standards and the certification systems sitting behind them, whether public or private, are a means of assuring buyers of the quality of products or the conformity of processes and production methods. Quality aspects can be related to the product itself or the process by which it was produced. Standards and certification are especially useful where there is information asymmetry, that is, where buyers and consumers cannot easily judge certain quality aspects of products or production processes (FAO, 2011). These quality aspects include what are termed credence goods. Food safety and the environmental friendliness of products are both examples of credence goods because consumers cannot practically assess either aspect and use that assessment to inform their purchasing decisions (FAO, 2001). Standards, and certification against those standards, are a way of compensating for information asymmetry. Certification (and related labelling of certified products) offers verification or a “burden of proof” that given standards have been complied with (FAO, 2011).

In terms of content, standards can relate to products themselves (specifications or criteria for product attributes) or to processes (outlining criteria and practices for the way products are made). Food safety standards typically focus on process aspects with the overall goal of improving the safety of final products. However, they can also define product standards related to residues of additives, contaminants or in terms of microbiological criteria (FAO, 2011).

Standards developers include a range of actors (FAO, 2011):

- **Buyers** (individual retailers, processors, food service operators, etc.) – standards are internal to the company and might simply reflect product and process specifications required of suppliers and/or requirements for certification to an independent third-party certification scheme.
- **Groups of producers and/or industry bodies** – usually reflecting their quality claims, sometimes based on geographical origins, and often referred to as codes of conduct or codes of practice.
- **Independent non-profit organizations or non-governmental organizations (NGOs).**

2.2.2. Typologies of standards

Distinction between private/public standards

Standards set by public authorities, usually referred to as “technical regulations”, are typically mandatory. Private standards by definition are voluntary, although they may in practice become de facto mandatory where compliance is required for entry into certain markets. In the food safety area, private certification schemes emerged to verify compliance with government-mandated requirements for firms to introduce Hazard Analysis and Critical Control Point (HACCP) food safety management system (FAO, 2011).

Private standards have become increasingly important in global agri-food value chains, increasingly pervading both domestic business and international trade. One of the defining characteristics of these private standards, particularly as they relate to food safety, is an increasing focus on the processes by which food is produced.

On the other hand, mandatory public standards carry with them a legal obligation for compliance and are a response to a perceived market failure; as such they are often implemented in the presence of negative externalities, to ensure the provision of public goods, or to mitigate information asymmetry (Hobbs, 2010). Examples include mandatory food safety management practices, pesticide residue limits and waste water treatment regulations for the protection of the environment and human health, and prohibitions on specific confinement practices for livestock in the interests of animal welfare. Other examples include requirements for mandatory labelling of nutritional content in a consistent format, requirements for labelling the presence of allergens and production and labelling standards for use of the term “organic”.

Typology of private standards:

Following the classification of the WTO with respect to private standards, we distinguished three forms of private agri-food standard in Figure 4. This classification is based on the bodies that generate the standards.

Individual Firm Standards	Collective National Standards	Collective International Standards
<ul style="list-style-type: none"> • Nature's Choice (Tesco) • Filières Qualité (Carrefour) – version applied in multiple countries • Field-to-Fork (Marks & Spencer) • Filière Controllée (Auchan) –version applied in multiple countries • P.Q.C. (Percorso Qualità Conad) • Albert Heijn BV: AH Excellent 	<ul style="list-style-type: none"> • Assured Food Standards (UK) • British Retail Consortium Global Standard • Freedom Food (UK) • Qualitat Sicherheit (QS) • Assured Combinable Crops Scheme (UK) • Farm Assured British Beef and Lamb • Sachsens Ahrenwort • Sachsen Qualitatlammfleisch • QC Emilia Romagna • Stichting Streekproduction Vlaams Brabant 	<ul style="list-style-type: none"> • GlobalGAP • International Food Standard • Safe Quality Food (SQF) 1000/ 2000 • Marine Stewardship Council (MSC) • Forest Stewardship Council (FSC)

Figure 4 - Example of private standards in agri-food chains (Source: WTO, 2007)

(1) **Individual company standards.** These are set by individual firms, predominantly large food retailers, and adopted across their supply chains. These are frequently communicated to consumers as sub-brands on their own/private label products. Examples of such brands include Tesco's Nurture, Tesco Nature's Choice and Carrefour's Filières Qualité. This communication to the consumer make claims about the superiority of product or process attributes. Such standards may have national or international reach. In some cases, such as Carrefour, the standard is applied in multiple subsidiaries of the parent company.

(2) **Collective national standards.** These standards are set by collective organizations that operate within the boundaries of individual countries, including industry associations and NGOs. These organizations can represent the interests of commercial entities (for example food retailers, processors or producers) or be NGOs. These and other entities are then free to adopt them if they wish. It is important to note, however, that some of these standards are inherently national, while others have international reach. Some such collective national standards are specifically designed to establish claims about food from particular countries or regions. The Farm Assured British Beef and Lamb (in the UK) and the QC Emilia Romagna (in Italy) schemes sustain claims about the superior attributes (safety, quality, environmental impact, etc.) of products conforming to these schemes. They are designed to differentiate these products from competing products. As a result, they are usually "visible" to the consumer; announcing their presence in the form of labels and trademarks. Other standards are national in character because they have been developed

by national agencies, but they frequently have international reach. This is true of the British Retail Consortium (BRC) Global Standard for Food Safety (see below). Although originally developed by a trade body in the UK, it is applied to suppliers in multiple countries and can be adopted by suppliers not selling into the UK market if they feel that this presents a competitive advantage. It is possible for the standards to move from being national to international if the governance structures of the bodies creating and controlling the standard are internationalized.

(3) **Collective international standards.** This category of standard is often defined by the reach of the standard; that it is intentionally designed to be adopted (required or used) by organizations in different countries. This frequently means that the organization that sets the standard has international membership. So, for example, GlobalGAP (formerly EurepGAP) was initially created by an international coalition of European retailers. Its membership now is more diversified and much more international (see below). Indeed, we see private standards being set by differing combinations of public, private and NGO actors (Abbott and Snidal, 2008), such that these different entities participate in the governance of these standards in differing proportions. The Forest Stewardship Council, for example, has stakeholders from many different countries and maintains parity between northern and southern stakeholders (Dingworth, 2008). So, the organizations that create collective international standards may represent the interests of commercial entities (for example food retailers, processors or producers) or NGOs, or both.

Hatchuel et al. (1998) add to this typology a new developing form of standards. **Many companies have developed a “sector approach” or “sector agreements”.** In France, the “Filière Qualité Carrefour”, or Auchan’s “Filière Agriculture Raisonnée” are good examples of it. Those approaches have a double aim: on one hand, the brands seek to reassure the consumers on the products they propose by proposing their own quality signal and communicating around the additional guarantee that these systems propose (complete products traceability, agriculture which respects the environment but also animal health and wellness, animal alimentation). On the other hand, those quality signals also have a role of differentiation on products which used to be hard to differentiate on markets such as fruits or meat. The particularity of this kind of approaches (Hatchuel et al.) is that not only it leads to quality improvements, **but it also induces profound changes with the sectors.**

Those agreements are based on the definition, the application and the control of different specifications relative to the product, which are different from company to company. For example, in sectors such as fruits and vegetables, specifications might include criteria on the product itself,

but also clauses on production techniques: maximum input threshold (nitrogenous fertilizing but also pesticides), banning of some chemical inputs, etc.

According to Hatchuel et al., **those specifications are generally more strict than official regulatory systems.**

Hatchuel et al. identify two main consequences linked to this kind of agreements:

- (1) **The establishment of relations between producers and distributors:** the specifications on the production are negotiated directly between the producer's representatives and the brands. The implementation of such agreements generally happens between a brand and a group of producers: given the required volumes, it is simpler for the brands to deal with a representative entity.
- (2) **An increasing communication** around agricultural production

Process/Products standards

Traditionally, standards focused on the characteristics of a product. This included, for example, size, composition, function, and health and safety impact. Product standards were, therefore, sector-specific and technical in nature (FAO, 2011)

Since the mid-1980s there has been a gradual shift to process standards. Rather than the technical characteristics of the product, process standards refer to management practices in the production process. In some cases, these include clearly defined and measurable bench-marks, allowing firms to gauge how well they perform in reaching particular targets. In other cases, however, the defining criteria against which performance is measured is contentious, especially in areas where ethical, social and environmental values are not universally held. Such differences in values cause friction because, as in product standards, the formulation of process standards has moved from the national to the international arena (ibidem)

However, the distinction between product and between product and process standards, while widely used, is becoming hazy. The distinction is likely to become more ill-defined as producers seek to reduce the range of applicable standards by incorporating process concerns (say levels of pesticide residues in food crops) into product features.

2.2.4. Sustainability standards control

Certification is the procedure by which a certification body or certifier gives written or equivalent assurance that a product, process or service conforms to certain standards (FAO, 2011). There are three main types of certification:

- **first-party certification:** by which a single company or stakeholder group develops its own standards, analyses its own performance, and reports on its compliance, which is therefore self-declared;
- **second-party certification:** where an industry or trade association or NGO develops standards. Compliance is verified through internal audit procedures or by engaging external certifiers to audit and report on compliance; and
- **third-party certification (TPC):** where an accredited external, independent, certification body, which is not involved in standards setting or has any other conflict of interest, analyses the performance of involved parties, and reports on compliance. What distinguishes TPC is its claimed independence from other participants involved in food or agricultural production, such as retailers or suppliers.

Hamprecht et al. (2005) identify two major challenges in controlling supply sustainability:

- (1) **The controls need to be regularly refined or extended**, to ensure consideration of new research findings. For example, the list of herbicides that can be recommended to farmers needs to be regularly reviewed to ensure that crop protection has a minimal impact on biodiversity.
- (2) **Controls of environmental and social performance aspects need to be integrated with economic controls.** Often, environmental and social performance aspects are accounted for in separate control systems. However, in order to ensure their efficient application, controls of social and environmental performance also need to be linked closely to other controls of the food supply chain, such as quality, food safety, and costs. Whenever possible, synergies should be created in the controlling process. Ideally, one piece of information on a supply chain should serve multiple purposes.

2.2.5. Different examples of sustainability standards

We chose to illustrate the above concepts by exposing three standards that have the mission to guarantee sustainable agriculture: (1) the EU organic certification, (2) the ISO 24000 and (3) the GlobalGAP standard. For each of them, we try to understand the background, the main criteria needed to be certified, the certification process and the various controls deriving from the certification.

One aspect that the three standards are sharing is that it is quite difficult to get an overview of what they are covering. Therefore, the aim of this part is to understand the underlying philosophy

of each of those standards and which idea of sustainable agriculture and sustainable sourcing they propose.

(1) Organic certification in the EU

Overview. The organic standard aims to apply the approach and philosophy we described in the previous part to food products by guaranteeing the process of production. Simultaneously, hundreds of private organic standards exist in the world, whose importance varies in terms of number of farmers and volume of products. As it is the most relevant for our study, we chose to focus on the EU organic standards.

EU organic label requirements. In the EU, for a food product to be labelled as organic, every organisation working up and down its supply chain – from farmers, to packers, to food processors, and organic retailers – have to meet organic standards and prove it to an organic certification body.

The regulation is based on a number of key principles, such as:

- Prohibition of the use of GMOs
- Forbidding the use of ionising radiation
- Limiting the use of artificial fertilisers, herbicides and pesticides
- Prohibiting the use of hormones and restrict the use of antibiotics and only when necessary for animal health

The whole EU regulation on organic production can be found in annex of this thesis.

Therefore, organic standards is **both a process and a product standard**.

Labelling of the EU organic standard. The organic logo (Figure 5) gives a coherent visual identity to European Union produced organic products sold in the EU. The organic logo can only be used on products that have been certified as organic by an authorised control agency or body.



Figure 5 - European label for organic products

Challenges of EU organic standards. Several challenges concerning European organic certification have been identified in literature review:

- The label itself can be used to mislead many customers that food labelled as being organic is safer, healthier and more nutritious (Blair, 2012)
- Critics of formal certification also fear an erosion of organic standards. Given that organic products are now sold predominantly through high volume distribution channels such as supermarkets, the concern is that the market is evolving to favor the biggest producers,

and this could result in the small organic farmer being squeezed out. (Blair, 2012, Gautronneau 1997)

- Originally, in the 1960s through the 1980s, the organic food industry was composed of mainly small, independent farmers, selling locally. Organic "certification" was a matter of trust, based on a direct relationship between farmer and consumer. Critics view regulatory certification as a potential barrier to entry for small producers, by burdening them with increased costs (Gautronneau, 1997)
- The fact that European organic label is weaker than French organic label (Gautronneau, 1997)

In response to the challenges posed by this rapid expansion and in order to provide an effective legal framework for the industry, the EU has passed new legislation that will come into force on 1 January 2021. The following changes will be made (EC, 2019) :

- a strengthening of the control system, helping to build further consumer confidence in the EU organics system
- new rules for producers which will make it easier for smaller farmers to convert to organic production
- new rules on imported organics to ensure that all organic products sold in the European Union are of the same standard
- a greater range of products that can be marketed as organic

Therefore, new labels have emerged, which claim to go further than organic EU label, for example the French label "Bio Cohérence": created in 2009 by the FNAB (French Federation of Organic Farmers), the Biocoop retailing stores, reunited within the association named "Alternative Bio", they decided to create higher standards than the EU organic standards. The "Bio Cohérence standard guarantees:

- the non-coexistence between organic and non-organic crops
- Complete ban of the use of GMOs
- 100% of organic ingredients in processed products

(2) ISO 14001 certification

Overview. ISO 14001 is a **voluntary international** standard published by the International Standard Organization in 1996, applicable to any type of public or private organization that **specifies the requirements of an environmental management system.**

According to ISO 14001, an environmental management system is *"that part of the overall management system which includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy"*. This broad definition stresses the intended general

application of environmental management systems, which are centered on management processes rather than on specific technical or environmental issues (Curkovic and Sroufe, 2011). It also allows companies to demonstrate their social responsibility and provides them with a structured framework for the management of their environmental issues. Finally, the development of ISO 14001 is part of the growing globalization of the world economy, which requires the adoption of international standards that facilitate exchanges and communication between countries (ibidem).

Registrations issued worldwide are estimated at more than 130 000 in 130 countries.

Requirements. The requirements of the ISO 14001 standard are founded on five management principles, namely: (1) *commitment and policy*: managers must implement a policy demonstrating their environmental commitment; (2) *planning*: a company has to define its plans and objectives on the basis of an assessment of its environmental situation; (3) *implementation and operation*: people whose work may have a significant impact on the environment must receive the required training and information, and appropriate, regularly updated documents must be provided concerning procedures and individual environmental responsibilities; (4) *checking and corrective action*: discharges to the environment must be systematically measured and compared with targets, and non-conformance with the system must be rectified using corrective measures; (5) *Management review and continual improvement*: regular environmental audits must be held and the environmental management system (EMS) must be reviewed periodically by company management (Curkovic and Sroufe, 2011).

ISO 14001's EMS standards are management tools and process standards. Therefore, it is not a performance standard. In other words, these standards do not tell organizations what environmental performance they must achieve. Instead, the standards describe a system that will help an organization to achieve its own objectives. The assumption is that **better environmental management will lead to improved environmental performance** (Tibor and Feldman, 1996; Handfield et al., 1997).

The requirements can be found in the annex. Certification is performed by third party organizations.

ISO 14001 and supply chain management. The standard was designed to achieve a full integration of environmental and business management and enable companies and their supply chains to take a more proactive approach towards managing environmental issues (Curkovic and Sroufe, 2011). A widespread criticism of the ISO 14001 program is that it is not connected directly enough to environmental performance. For example, a registered company can still have substandard processes and waste streams because registration does not tell a company how to

improve efficiency and pollute less (Mroz, 1997; Abarca, 1998). Registration also does not require that firms demonstrate compliance and that their stakeholders are satisfied (Curkovic and Sroufe, 2011). ISO 14001 states that an organization should “give consideration to the environmental performance and practices of suppliers,” so while it is clear that an organization has responsibilities to control a supplier’s performance, it is not specific in terms of what goals and objectives should be set (ibidem). Therefore, the literature is clearly divided in its assessment of ISO 14001, which is viewed as a variant of total quality environmental management or a paper-driven process of limited value.

(3) GlobalGAP certification

Background. GlobalGAP is a voluntary standard required by many supermarkets’ chains in Europe. It covers the agricultural production process, from inputs to the farmgate (FAO). The standard focuses on business-to-business relations. GLOBALGAP has so far developed GAP standards for fruits and vegetables, combinable crops, flowers and ornamental plants, green coffee, tea, pigs, poultry, cattle and sheep, dairy and aquaculture (salmon). The idea when GlobalGAP was created was to improve mainstream farming by consolidating an “integrated” protocol. Therefore, the underlying philosophy of sustainable agriculture is **the implementation of an integrated agriculture**. The twin goal was to create an “environmentally virtuous” audit system, but to make such virtue achievable by mainstream farmers, thus increasing the supply of sustainable products (Campbell, 2005).

Requirements. The GlobalGAP standard requires that producers establish a complete control and monitoring system. Intended to meet compliance requirements and drive greater efficiency in production, improve business performance and reduce waste of vital resources, GlobalG.A.P. certification covers:

- Food safety and traceability
- Environment (including biodiversity)
- Workers’ health, safety and welfare
- Animal welfare
- Integrated Crop Management, Integrated Pest Control
- Quality Management System, and Hazard Analysis and Critical Control Points

GLOBALGAP rules are relatively flexible about field practices such as soil fumigation and fertilizer usage compared to the organic certification. However, there are strict regulations about pesticide storage and pesticide residue limits. GlobalGAP standards also include areas that are not detailed by the organic standard: hygiene, workers health, safety and social and labor issues. Similarly to organic certification, it is both a **product and process standard** (Campbell, 2005)

Challenges. Several challenges concerning the GlobalGAP standard can be identified:

- While producing “safe” food, integrated systems did not resonate as strongly as organic with wider anxieties about the environment (Campbell, 2005). The brand lacked the environmental credentials and brand recognition of organic production and was almost invisible to consumers. As a consequence, there is no special price premium or product label associated with GlobalGAP (FAO, 2011).
- The producer or group of producers needs a complete administrative system to keep track of all farm activities; therefore it requires a sufficient administrative and financial capacity (FAO, 2011)
- Finally, many of the buyers are either members of GlobalGAP or apply the GlobalGAP requirements (aimed at ensuring consistent application of Good Agricultural Practices with a particular focus on health and safety of fresh produce) as well as organic requirements. **This results in double inspection and certification requirements** (Campbell, 2005).

All the above challenges act as a brake to the development of the GlobalGAP certification.

The following table summarize the different findings on the three chosen labels and evidences the underlying philosophy of each of them:

	EU organic standard	ISO 14001	Global GAP
Typology of standards	-Product and process standard -Governmental standard -Business to consumer standard	-Process standard -Collective international standard -Private standard -Business to business standard	-Product and process standard -Collective international standard -Private standard -Business to business standard
Scope	Organic integrity	Environnemental management system	Food safety and environmental quality
Underlying farming approach	Organic farming	No specified approach as the standard focuses on the management process	Integrated farming
Type of control	Third party certification	Third party certification	Third party certification
Number of farmers and certified areas in the system	Worlwide over 1 million operators. In the EU over 200 000 operators	130 000 in 130 countries	92000 growers
Labelling of products	Yes, for use on consumer packaging, special logo	Business-to-business scheme that does not result in labeling on the consumer packaging	Business-to-business scheme that does not result in labeling on the consumer packaging

Figure 6 - Comparison table of three sustainability standards applying to food products (Source: the author)

2.2.6. Conversion to a sustainable model

Period of transition towards a sustainable model means the time period when the production does not fully meet the sustainability criteria defined either by the company itself either by the sustainability framework (for example organic framework), but already requires more investment (be it time investment or money investment) from the farmer.

Transition towards a more sustainable model requires significant learning, based on both counselling support and collective dynamic within farmers communities (Lamine and Meynard, 2009). Moreover, transition toward alternative farming models such as integrated farming are, by nature, less stable than conversion to organic farming. In fact, those models are not stabilized by the certification and the market. (Lamine and Meynard 2009).

For instance, during the conversion period to organic production, organic production methods need to be used but the resulting product cannot be sold as organic. The length of this conversion period depends on the type of organic product being produced (European Commission, 2005):

- 3 years for orchards of perennial soft, top and vine fruits
- 12 months for pig and poultry grazing
- 2 years for land ruminant grazing annual crops

It has been widely acknowledged in the scientific literature that this conversion period, unless if offset by financial incentives, acts as a strong brake on conversion to a more sustainable agriculture.

2.2.7. A key point for the implementation of sustainable sourcing: collaboration between supplier and buyer

In its report *"Building resilient and responsible supply chains"* (2011), EY identifies the following proposition as a key finding: **leading companies in terms of sustainable sourcing are establishing a shared commitment with suppliers**. Some companies, considered as leaders in supply chain sustainability consider suppliers as an extension of the business, rather than having a more traditional view as vendors (EY, 2011). Companies that focus on creating shared value with their suppliers are likely to achieve a mutually beneficial relationship that takes advantage of higher quality. Leading companies work with their supplier to create meaningful frameworks for performance monitoring and improvement. Overall, leading companies are not looking to "police" suppliers and terminate those that underperformed. Many companies are finding that once they start a conversation with their suppliers, they can learn a lot on how to address issues

and improve the sustainability of their products and services. However, beyond the promise of continued or additional work, few companies are providing incentives to their suppliers, with most continuing to establish minimum standards (EY, 2011).

According to Gray (1989), collaboration is “*a process through which parties who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision of what is possible*”. This definition turns the focus on the amount and the quality of communication between the actors in practising collaboration. Communication is an integral part of every relationship and plays a critical role in the development of exchange relationships as well as collaboration (Dwyer et al., 1987).

2.3. Sustainability governance

2.3.1. Definition of governance and different actors

Governance mechanisms may include policies, guidelines, rules, laws, norms, standards, monitoring and verification procedures, financial and other incentives, and the exercise of authority. We follow Reynolds (2004) and define governance as “*the relations through which key actors create, maintain, and potentially transform network activities*” (p. 728). Accordingly, by governance mechanisms we refer to those practices used by firms to manage relationships with their suppliers with the aim of improving their sustainability performance (Gimenez, 2012). Monks and Minow (2004) add the dimension of sustainability by defining governance as the structure that ensures that decisions are made to determine long-term, sustainable value for an organization. Formentini and Taticchi (2016) define sustainable supply chain governance mechanisms as practices, initiatives and processes used by the focal firm to manage relationships with (i) internal functions and departments and (ii) their supply chain members and stakeholders with the aim of successfully implementing their corporate sustainability approach.

Overall, governance processes involve both internal and external stakeholders and aims to describe the interactions between them and how to work successfully together.

2.3.2. Governance mechanisms in the supply chain

Four mechanisms of governance have been identified in the literature concerning sustainable supply chains (Wang and Ran, 2018):

- (1) **Communication and trust mechanism:** effective cross-functional communication contributes to mutual understanding and trust and having been widely considered as an important driver for culture, identity, image and reputation of a supply chain. Two patterns of communication could be used: formal and informal communication. Formal

communication involves specific structural formats for engagement, such as cross-functional teams, co-location, regularly scheduled meetings and. Informal communication, viewed as “socialization tactics” in a non-workplace environment, focuses on mutual understanding and awareness by interpersonal relationship-building activities. Informal communication often plays a more significant role in creating and maintaining trust, contributing to reduced conflicts and leading to a more coherent collaboration of the supply chain. (ibidem)

- (2) **Benefit and risk sharing mechanism:** Supply chain tends to increase in complexity. The involvement of numerous partners in a network of relationships causes risks and vulnerability for everyone. Thus, how to reduce the risk of disruption as much as possible becomes a major concern in SCM. Benefit and risk sharing is considered one of the effective programs to handle this challenge. For a trust-based complex federation of organizations, a benefit and risk sharing mechanism is significant to supply chain continuity. (ibidem).
- (3) **Collaborative R&D mechanism:** Supply chain is also a collaboration chain and an innovation chain. From the Resource-based view, the focus of SCM research in recent years has shifted from the narrow operating efficiency considerations to the effective resources or capabilities development that emphasizes collaborative R&D and innovation. Collaborative R&D and innovation reflects the characteristics of win-win cooperation in SCM which contributes to maximizing their mutual interests that benefit the whole supply chain. Greater supply chain collaboration has important strategic significance to the boundary-spanning of a supply chain because they need to utilize the resources and knowledge of their partners to enhance innovation capacity that could not be accomplished solely by themselves.
- (4) **Restructure mechanism:** From a strategic perspective, a supply chain is structured and established based comparative advantage with focus on win-win potentials. Today's tremendously changing and competitive environment imposes a significant challenge for SCM. If the existing supply chain structure could not meet their strategic goals and respond to dynamic and unpredictable changes after the necessary adjustment and maintenance procedure, the supply chain should be restructured to adapt to such changes.

Governance of a supply chain also requires a governance structure. Wang and Ran (2018) propose as the governing structure of a sustainable supply chain:

- (1) a decision-making committee
- (2) an information sharing platform

- (1) **The decision-making committee** is established upon the consensus of all partners in the supply chain aiming at a win-win strategic planning. This consensus among supply chain partners is the result of negotiations between partners based upon rational tradeoff leading to a consent on the pattern of power distribution in decisions pertinent to the interests of the whole supply chain. An effective decision-making committee will be empowered by the whole supply chain to serve as the mind for this complex federation of organizations to handle the myriad activities and multiple objectives of the supply chain. (ibidem)
- (2) **Information sharing platform** is considered as an essential component of a supply chain architecture which contributes to a better collaboration and integration. An efficient and effective information sharing platform should be structured to enable the whole supply chain to share essential market and operational information, improve productivity, and reduce transaction cost and time-to-market. In fact, what the information sharing platform shared is not just information, but also knowledge. Increasingly, a key goal in SCM is to acquire and disseminate knowledge in ways that lead to effective decision making. (ibidem)

2.4. Success factors of a sustainable sourcing program

Boström et al. (2015) identify several success factors to the implementation of a sustainable sourcing program:

- Many actors should be involved in networks and hybrid constellations: included actors need to be of different kinds, with different interests and concerns (economic, social and environmental), of different types (state, private, non-governmental associations), with different geographical belonging (local, distant), and operating on different scales (local, transnational). This **plurality of constituencies** is a necessity for on-the-ground improvements.
- General recognition that **generic ('global') standards alone cannot achieve meaningful results**, but that **sensitivity, familiarity, and recognition of context must always be present**. The networked, multi-actors and multi-scalar approaches need to confront the lost "proximity" and invent new types of "distant proximities". The challenge is to include proximity and stakeholders representing local contexts in global governance arrangements without simply introducing new regulatory loopholes.
- Monitoring and enforcement mechanisms need to be supplemented with **education** and other programs among suppliers to build capacity for compliance.
- There must be integration of "**reflexive learning**" to improve governance arrangements over time. Reflexive learning goes beyond single loop learning and involves deeper

considerations about how existing practices, norms, discourses, policies and interactions reproduce the same problems over and over again. Reflexive learning is facilitated when different actors engage in dialog and cross-fertilize their expertise, experiences and framing.

In this context, 'responsibility' cannot be interpreted as merely looking outside one's own national and organizational boundary, formulating norms and standards the content of which reflects only the conventional norms and virtues of one particular place/region, and then imposing them on others, with corrective action when non-compliance has been detected. The evidence of failures following from this vertical and one-sided sustainability and responsibility strategy are convincing. Responsibility, seen in this way is commitment to dialog, responsiveness and learning. At issue is the development of collaborative, long-term approaches in which roadmaps, know how, and risks and benefits are shared among all supply chain players (Boström et al., 2015)

To summarize the findings of this part, which is key within our literature analysis, we got a better understanding of which stakeholders had to be involved, which instruments those stakeholders had at their disposal and which mechanisms of governance and control they had to implement for this operation of "translation" (Landais, 1998) to be successful. Thereafter, we face the need to confront this theoretical part to the field reality.

However, for this field study to be relevant, we had to restrict the area of study and we chose to apply the theoretical concepts to a particular raw material. It seemed essential to focus on one product only as environmental challenges of different products can be very different. We chose to center this study on the wheat, within a particular context (the biscuits and cakes producing companies in France and Italy). Those choices will be explained, and the field study methodology will be explained in detail in the next chapter. Therefore, the framework of wheat sourcing in a certain context (French and Italian) provide us a precise and delimited framework to confront our findings with reality.

3. Application to wheat supply chains

In the context of this thesis, we chose to apply the concepts we explored in the literature review to a specific case: the case of wheat sourcing by biscuits and cakes manufacturers. Thus, we chose to complete the above literature review with a focus on wheat production and its transformation into biscuits and pastries in France to be able to understand the specific aspects related to these supply chains.

As wheat goes through several transformation processes before being purchased by the consumer, its characteristics and differentiating factors are hardly visible for consumers. Moreover, wheat production has a very low environmental impact compared to other products (Poor, Nemecek, 2018). Getting into the consumer position, we could therefore wonder why wheat is an interesting subject to study. In fact, wheat stands at the crossroad of strategic stakes:

- (1) Cereal grains, among other wheat, have been the principal component of human diet for thousands of years and have played a major role in shaping human civilization (Awika, 2019)
- (2) Cereals still have a significant place in our nutrition since more than 50% of world daily caloric intake is derived directly from cereal grain consumption (Awika, 2019)
- (3) In terms of environmental sustainability, wheat production is particularly affected by climate change and has to find ways to adapt (Enghiad et al., 2017)
- (4) At the light of the challenges listed above, some initiatives to innovate in terms of wheat production sustainability have emerged.

The main difficulty encountered was operate the translation from scientific literature to management theories and to select the significant background elements which would have enabled us to fully understand the subject under study.

3.1. Wheat: a strategic resource at a global level

Wheat is a key global commodity in terms of acreage and tradeable value and as a staple in household diets. **Approximately 21% of the world's food depends on annual wheat crop harvests** (Enghiad et al., 2017). It is grown on more land area than any other commercial crop and continues to be the most important grain food source for human consumption (Curtis et al., 2002). World wheat production is ranked third in weight produced, after corn and rice. Wheat is the major source of carbohydrates in the diet of people from many countries, including Australia, most of Europe, Northern Asia, and Northern Africa (USDA, 2017).

Wheat characteristics

Cultivated wheat is classified into two major types; the hexaploidy bread wheat (commonly called soft wheat), and the tetraploid durum wheat. Soft wheat has multiple purposes:

- Human feeding (bread, biscuits, cakes)
- Animal feeding (poultry, cattle, sheeps)
- Industrial purpose (it can be incorporated in cosmetic products, in paper, in pharmaceutical products, or in biofuel. It can also be used as food additive in numerous products)

Durum wheat is mainly used to make pasta products.

Currently, at the global level, soft wheat accounts for 95% of all the wheat produced (Tadesse et al., 2016). We will focus on soft wheat production in the rest of this thesis.

Wheat demand is becoming global, but its production is still localized in territories which beneficiate from geographic natural advantages: water, fertile soil, temperate climate (Abis, 2015). In general, wheat is more adaptable to a wide range of growth conditions than other major cereal crops. Constraints linked to wheat production are that it requires a rich and deep enough soil and a good nitrogen nutrition. On the other hand, wheat production brings carbon to the soil and improve soil structure. Soft wheat is sown between October and November and harvested in July or August of the year after; therefore, the cycle lasts for approximately 9 months.

Green revolution and wheat production

The **Green Revolution**, or **Third Agricultural Revolution**, is a set of research technology transfer initiatives occurring between 1950 and the late 1960s, that increased agricultural production worldwide, particularly in the developing world, beginning most markedly in the late 1960s. Wheat production at the global level has increased dramatically from the 1960s through to 2013 (see Figure 4) without much change in the total area grown to wheat (Tadesse et al., 2016).

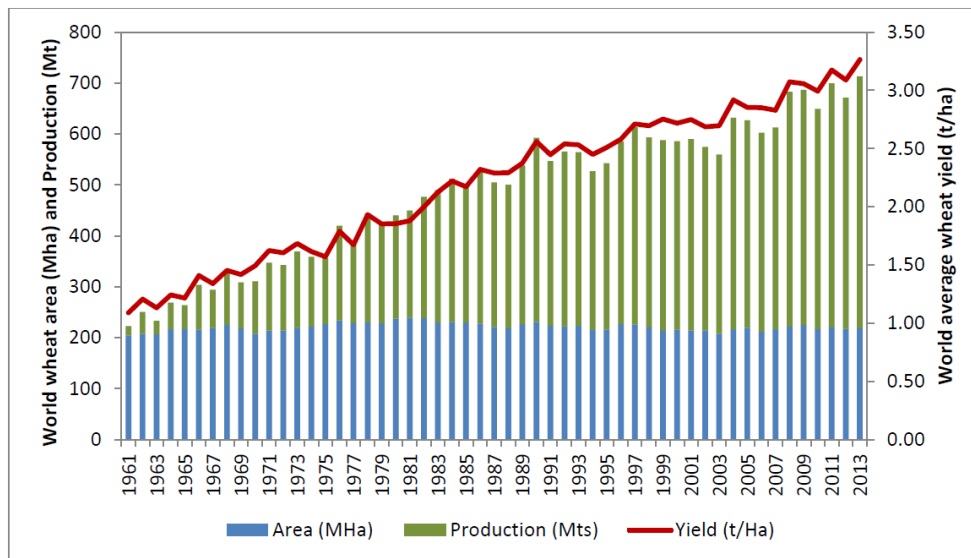


Figure 7 - World wheat yield, production and area from 1961 to 2013 (FAO, 2014)

Three factors contributing to the success of the wheat Green revolution (Tadesse et al., 2016):

- (1) The variety of wheat used: farmers shifted to high yielding and rust-resistant wheat seed
- (2) The establishment of a free, unrestricted global wheat research system
- (3) Large scale investment in fertilizers, irrigation and transportation infrastructure

From the mid-1970s onwards, **wheat production has grown at a faster pace than population** (Shewry and SJ, 2015).

Although it has been widely acknowledged that green revolution farming methods have considerably improved agricultural productivity in many parts of the world, the high-yield farming methods used in order to do so have been criticized for their environmental impacts; a heavy reliance on fertilizers and pesticides, if improperly managed, can have significant effects on rivers and streams. Irrigation can also deplete groundwater supplies and contribute to salinization of soil. On the other hand, increasing yields reduces the amount of land needed for agriculture, permitting more land to remain intact or be utilized for an alternative purpose (Tadesse et al., 2016).

3.2. Wheat industry in France and Italy

At the European level, soft wheat is the main cereal produced (46%). The main producing countries are highlighted in Figure 5.

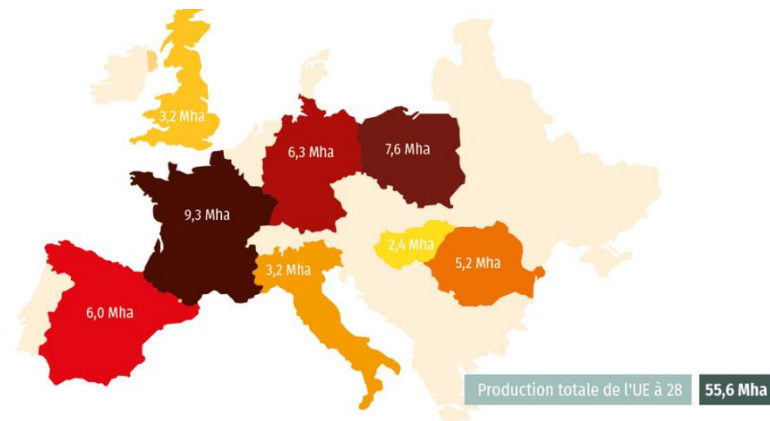


Figure 8 - Main soft wheat producing countries in Europe in 2017 (Source: Eurostat)

As we will focus on French and Italian companies producing biscuits and pastries, a focus on the local wheat industries is needed.

Wheat production in France

France is the 5th producing country and the 3rd exporting country of wheat globally.

Around 10% of the French territory area is dedicated to wheat production. Around 500 000 direct and indirect jobs are created in France by the wheat industry. In 2014, cereal exports represented 9,5 billions of euros, wheat being the major cereal. Thus, wheat is a major asset for French economic competitiveness and French strategic influence around the world (Abis, 2015). Robustness of the French cereal production model is based on regularity and quality. One of the main asset of France is its climate territory, which, combined with breeding selection and innovation, contributes to returns well above the global average (more than 7 t/ha compared to 3,7t/ha in average).

More than a third of the French UAA is devoted to cereals: mainly wheat, barley and corn.

Here are some significant figures which allow us to understand wheat market in France:

- Wheat represents 54% of the French cereals and covers 12 million acres. The production is mostly located in the west of France and around the Parisian basin.
- Within the soft wheat production, 9% is stocked and consumed within the farms, 44% stays in the French market and 47% of the production is exported.

- Within the French market, a small part of the soft wheat feeds the cattle, whereas the biggest part is transformed in flour and serves to produce bread, biscuits, pastries, or other aliments.

French wheat industry from wheat to bread, biscuits and cakes can be may be divided in different stages:

- **Cereal farmers:** there are more than 300 000 cereals farmers in France who grow their wheat and then deliver it to cooperatives. During the last decades, those farms have been through many groupings and as a consequence the average farming area sensibly raised in all the regions. Nevertheless, the “large farms” (more than 200 ha) only accounts for 6%. The small but very productive farms represent the robustness of the French agricultural model.
- **Collection by cooperatives.** In the cereal industry, there are 175 cooperatives which are in charge of collecting and redistributing the wheat produced by farmers. (Passion Céréalières, 2018). They represent an intermediary between the numerous farmers and the manufacturing industry.
- **Milling stage.** Milling is the process by which wheat is ground into flour. In France, there are 450 flour producing units. The first outlet for flour production is artisanal bread production; the second one being biscuits and pastries.
- Finally, the wheat is sold in the form of flour, either to industrial companies or to retailers.

Wheat production in Italy

Italy is the 19th producing country of wheat globally.

Soft wheat Italian’s production, in the 70s, was between 7 and 9 Mt. Since then, it has registered a constant decrease, mainly because the Italian UAA dedicated to soft wheat production largely decreased (from 3 million of hectares to 0,6 million of hectares today). This decrease in terms of cultivated land was only partially compensated by the increase of the yield per unit (which, during the same period, went from 2,6 t/ha to the historical record of 5,5 t/ha). This is due to the improvement of production techniques, to genetic selection and to the mechanization of the farming sector in the country’s productive North areas, and mainly in the Pianura Padana. Figure 9 shows the recent evolution of Italian soft wheat production. Today, the main soft wheat producing regions are Veneto and Emilia Romagna (Ismea, 2017).

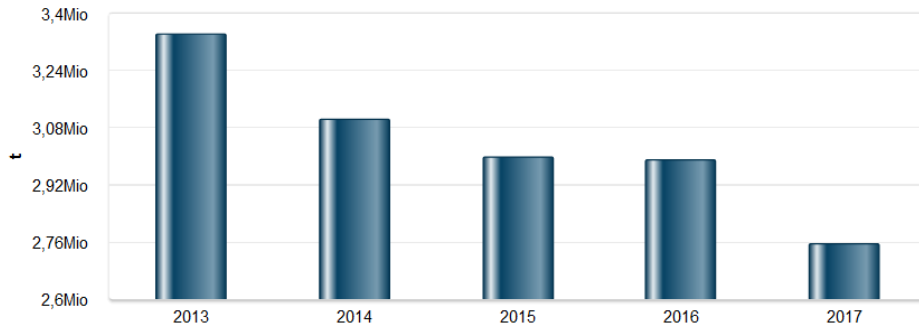


Figure 9 - Evolution of wheat production in Italy in tons between 2013 and 2017 (Source: Ismeamericati)

The wheat industry in Italy, from wheat to bread, biscuits and cakes can be may be divided in the same different stages as it is in France (cereal farmers, cooperatives, millers, and transformation before being sold to industrial companies or retailers).

Several challenges for soft wheat industry in Italy have been highlighted (Bertolini, 2015).

- National production is not enough to meet domestic demand. As a matter of fact, today the production of soft wheat in Italy has stabilized around 3,5 Mt per year; however, the Italian millers have a need of 5,5 Mt per year.
- As a consequence, the Italian milling industry developed a strong dependence to foreign importations (mainly from France, Germany, Austria, United States and Canada). Today, soft wheat importations account for 60% of the domestic needs.
- Grain quality: Italian grown wheat is not of great quality, therefore it has to be mixed with imported wheat.

3.4. Environmental impact of wheat production

Without going into specific details which would be non-relevant for this thesis, we attempted to list the interactions between climate change and wheat production in the following part. As evidenced in Figure 10, the emission of greenhouse gases mainly come from agricultural production.

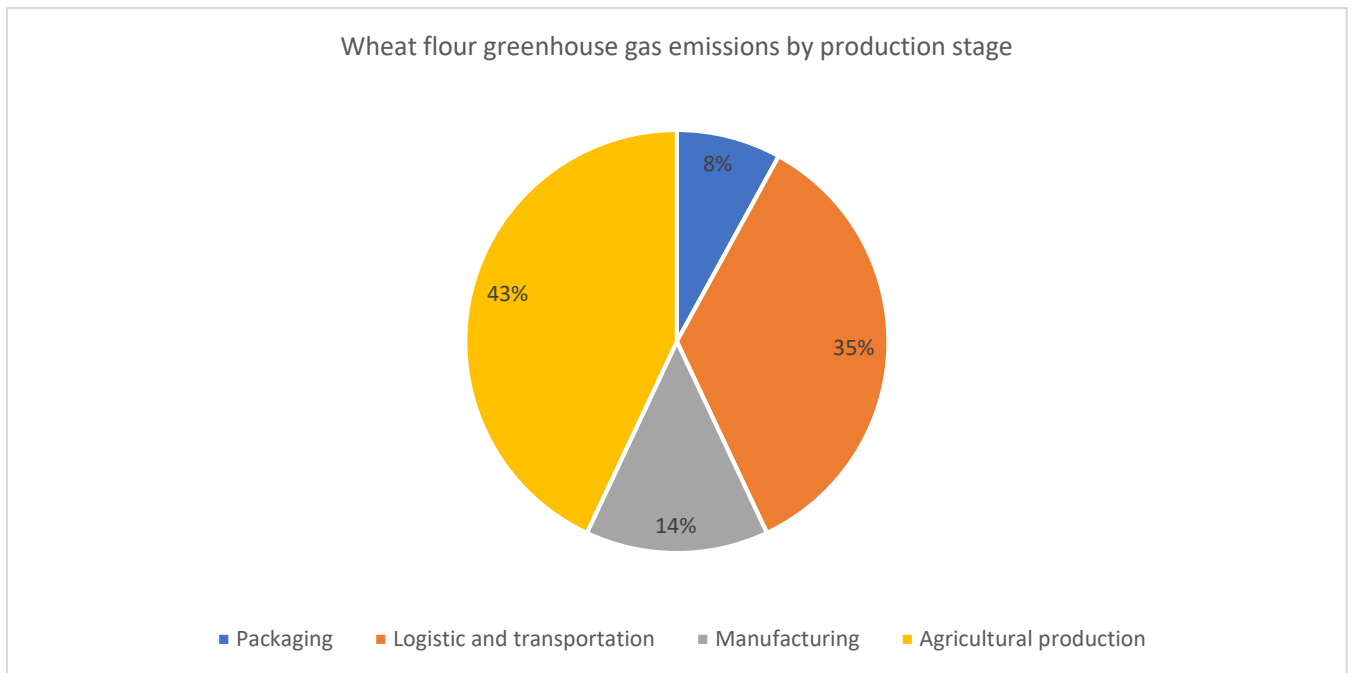


Figure 10 - Wheat flour greenhouse gas emissions by production stage (Source: Ademe, 2015)

Within the agricultural production stage, the main environmental challenges of wheat production are: release of N₂O, use of crop protection products, water management, impact on biodiversity, soil conservation, release of greenhouse gas (Tadess et al., 2016). The details of those impacts were explained in the first part of this thesis.

On the other hand, climate change affects particularly wheat production by increasing both abiotic stresses (heat, drought, cold, salinity and waterlogging) and biotic stresses (aggressive diseases and insect pests). With the current climate change effects, it is anticipated that new pests and diseases will emerge. The effect of climate change is also affecting the quality of wheat as increasing CO₂ may negatively affect protein quality and content and increasing temperatures can have a negative impact on grain size. (Tadesse et al., 2016).

3.5. Environmental standards for wheat production

Because of the several intermediate stages between wheat production and wheat consumption, the quality of the product is hard to be quantified. As a matter of fact, there is no well-known qualitative label existing for wheat flours. When looking at the labeling, it generally mentions only the type of wheat that has been used, the type of production (only if it is specifically organic), the brand and sometimes the mill, and the conservation period. The consumer may pay attention to some details: for example, the color of the flour, or the gluten content.

However, we chose to analyze two existing labels which were implemented in the wheat industry: the European organic label, and the CRC label which was created specifically for wheat industry in France.

○ **Organic wheat production**

As underlined in the previous part of this thesis, organic agriculture attempts to sustain ecological balance through the design of farming systems, preservation or establishment of habitats and maintenance of genetic and agricultural diversity (IFOAM, 2009). Organic grain systems are characterized by higher crop diversity and wider crop rotations compared to comparable conventional systems (Stockdale et al., 2002).

In the EU-28, the total organic area, fully converted and under conversion, increased from 2.3 million hectares in 1998 to 9 million hectares in 2010 (this corresponds to an annual growth rate of nearly 15%). In 2010, Austria and Switzerland had the largest share of total organic area in the UAA (respectively 19% and 11%), whereas France had one of the lowest shares in the EU member states with 3%. However, it is important to note that the main use of the organic arable land is production of cereal, but in 2010 it represented only 3% of the total cereal area in Europe.

The main challenge encountered by farmers in the process of conversion to organic crops is that wheat yield in organic farming varies from 30% to 70% of yield of conventional cropping (Stockdale et al., 2002). Higher premia for organic wheat may to some extent compensate for this. On the other hand, one of the main challenges encountered by the industrials, the retailers is the difficulty to find organic wheat suppliers. Therefore, the supply does not match the demand yet (Stockdale et al., 2002). Conversion time ranges from 12 to 24 months (ibidem).

○ **« Filière CRC – culture raisonnée contrôlée »**

The CRC label was created in 2000 by a group of farmers from Bourgogne, who were committed to produce in an alternative way. Today, the label gathers 1700 farmers, who harvested more than 400 000 tons of wheat in 2018, 38 millers, and 14 manufacturing companies.

The label is based on integrated agriculture techniques and on the environmental levels, the main commitments are:

- The guarantee of sourcing 100% French wheat
- Pesticides are used only as a last resort, with carefully selected products.
- A strong focus on biodiversity: interdiction of all products highly toxic to fauna and flora, protection of local endangered species, ...

Therefore, the requirements implemented by CRC label are well beyond the regulation requirements. The CRC label is validated by French Agriculture Ministry and is controlled and certified by a third party. The label is described by its proponents as a middle way between

conventional farming and organic farming: the advantage of CRC wheat production would be its higher profitability compared to organic wheat and its higher productivity.

This label is interesting within the context of this master thesis as it represents an innovative initiative which involves all actors of the supply chain, from the farmers to the retailers, proposing its own definition of sustainable agriculture.

To summarize, this chapter aimed to provide a global overview of wheat industry in France and Italy and some relevant inputs on the environmental challenges wheat production is facing. We understood that wheat is a key raw material globally which is already facing the impacts of climate change in a significant way. Therefore, its farming production methods must be adapted, and different innovative standards already exist and promote the use of sustainable farming methods, each with its own definition of what sustainable means.

4. Empirical research: cross-case comparison of wheat sourcing companies

4.1. Research question, hypothesis and methodology

4.1.1 Research question and hypothesis

The present research attempts to integrate current research on defining sustainability criteria in agri-food chains with wheat sourcing companies, and more particularly industrial cake and biscuits companies. Throughout the literature review, we saw that there was no systemic literature on the subject: definition of sustainable agriculture is addressed by one part of the scientific literature, and definition and implementation of sustainable supply chain is addressed by another. Scientific literature bridging the gap between both of this topic is scarce.

Therefore, without claiming to be comprehensive, we decided to tie both the issues together. The research question that guided our literature review had to be exploratory in order to attempt to grasp the entire diversity of models. We chose to focus on the following research question:

“The implementation of sustainability standards within the agri-food chain: study of wheat sustainable sourcing in biscuits and cakes producing companies.”

From the above literature review, we chose to focus on 4 hypotheses to confront to empirical research:

- (1) A cross functional approach is needed for the definition of sustainable sourcing criteria: procurement or supply chain functions are the ownership of the program, but they are supported by a good internal network. A formal governance process supports the implementation of the sustainable sourcing program.
- (2) The support of an external partner, such as an NGO, is a crucial choice for a company: it legitimizes the process and allows the company to gain expertise concerning its supply chain.
- (3) To source sustainable products, companies must define strong criteria of sustainable agriculture, based on scientific facts, defined in collaboration with external stakeholders and controlled by a third party.
- (4) Those standards must be supported by a strong sensitivity and recognition of context. Communication and trust in the relationship with the suppliers are essential for farmers to onboard the program and measures of support must be implemented during the transition period.

The next chapter will be dedicated to test those theoretical findings throughout a field study. The methodology of the field study construction will be explained in detail.

Therefore, the field investigation must be a way to infirm or confirm the previously stated hypothesis. In order to do so, we must understand how wheat sourcing firm develop sustainability programs. Our study focuses therefore on understanding firms' behaviors – firms which were primarily carefully selected because they fulfilled a number of precise criteria.

4.1.2 Methodology of the case study

The theory on case study research design

When it comes to the understanding of a firm behavior, as it is the case for the present research, interpretative research can be deployed through the usage of case study method.

A case study is defined as: “*a scientific investigation to a specific real-life event or a series of events that aims to resolve a situation or problem by decreasing ambiguity and number of factors that caused the situation or problem*” (Rogers, 2013). Problems or research objects are either procedures and situations or people and individuals. The case study approach allows in-depth, multi-faceted explorations of complex issues. It is for this reason sometimes referred to as a «naturalistic design », in contrast to an « experimental » design, in which the investigator seeks to exert control over and manipulate the variable(s) of interest. Thus, case studies are almost wholly-qualitative in nature (Rogers, 2013). In our specific case, the problem under observation is the implementation of a sustainable sourcing in wheat sourcing companies.

Analyzing and understanding the purpose of the research and the nature of the phenomenon under study can help researchers in their decision-making process. In particular, when inferring on the purpose of the research, the researcher should keep in mind the current state of art of the research in the given field: if the existing body of knowledge appears to be insufficient, the purpose of describing, classifying and comparing the phenomenon under study becomes extremely important as the research field is not sufficiently developed for the generalization of a model or theory (Bonoma, 1985). In this case, case study qualitative research appears consistent with the purpose of the research. As a matter of fact, the literature review highlighted that there was scarce scientific research giving a comprehensive approach of the implementation of sustainable sourcing standards, therefore linking scientific definitions of sustainable agriculture to organizational processes including a range of internal and external stakeholders and governance and control mechanisms. Therefore, it appears consistent to choose a case study qualitative approach for our field study.

What distinguish case study researches are few main factors (Rogers, 2013):

(1) they require data collection from multiple resources;

(2) they require a high degree of generalizability in order to serve its core purpose of application elsewhere

(3) it can be concluded by recommendations to facilitate applications in real-life situations in the professional area, and not only to be used for academic purpose.

Throughout our field study and the following analysis of the collected information from the different sources, we have endeavored to follow Roger's recommendations.

Cases selection

According to Yin (1981d), cases should be selected to ensure for the prediction of similar results (**literal replication**) or foreseeable contrasting results (**theoretical replication**) to ensure external validity. According to Stake, the *collective* case study involves studying multiple cases simultaneously or sequentially in an attempt to generate a still broader appreciation of a particular issue. In collective or multiple case studies, several cases are carefully selected. Yin suggest two or three literal replications (i.e. predicting similar results).

We chose to focus on four cases: LU, Blédina, Mulino Bianco and Jacquet Brossard. The four cases will be described in details in the next chapter, but below are listed some elements that led us to the choice of those specific companies.

- LU was chosen to give a point of reference. Indeed, LU Harmony program which will be studied in detail in the next part is considered as a pioneer in terms of the implementation of a sustainable sourcing program. Moreover, since the program was launched 10 years ago, we now have enough hindsight to analyze it in detail and draw some relevant conclusions.
- As we will see in the next chapter, the underlying approach of Blédina is quite similar to LU's program although the company has a different view of sustainable agriculture (scientific definition of sustainable agriculture, external and internal involved stakeholders, governance and control mechanisms). Therefore, it can serve as an interesting point of comparison.
- Barilla allow us to give some inputs from the Italian market. Comparing LU, Barilla, and Blédina, we were able to identify relevant elements to get a better understanding of how to source sustainable raw materials.
- Finally, Jacquet Brossard presents different characteristics and an entirely different approach, as sustainability does not lie at the heart of the company strategy. Examining a less mature company in terms of sustainability commitments, which presents different

organizational characteristics allowed us to get a comprehensive understanding of what were success factors for the implementation of a sustainable sourcing program.

Finally, it appears relevant to recall that the present work does not aim at building a generalizing theory and the four cases have been purposely selected to be able to provide some managerial recommendations concerning the implementation of a sustainable sourcing program.

The choice of qualitative data

According to Giroux (2003, in Butery), the case study approach usually combines multiple techniques for the data collection: interviews, participant and non-participant observation and document's analysis. The following section of the work provide a deeper understanding of the data collection methodologies applied in the research process.

The use of multiples sources of data (data triangulation) has been advocated as a way of increasing the internal validity of a study (Yin, 1981). In multiple case studies, data collection needs to be flexible enough to allow a detailed description of each individual case to be developed, before considering the emerging similarities and differences in cross-case comparisons.

Therefore, several sources of information were used:

- Documents found on internet (both companies' websites and external websites)
- Video interviews found on Internet from reliable sources
- Semi-structured interviews with four respondents, which were the primary source of information and analysis

The strength of qualitative research is its ability to provide complex textual descriptions of how people experience a given research issues.

Semi-structured interviews

Despite theoretical frameworks dividing between four main typologies of interviews (structured, semi-structured, informal and retrospective), in reality the line between each typology is feeble, meaning that the researcher will likely combine multiple typologies while interviewing the same informant. This does not undermine the effectiveness of the methodology, as soon as the interviewer is aware of the role, pros and cons of each typology of data collection before fieldwork application (Giroux, 2003). For the purpose of the present paper, the typologies which were mainly applied were semi-structured interviews. This typology of interview usually entails a specific goal of comparison or representativeness among informants.

Four semi-structured interviews were conducted with persons in charge of the implementation of programs related to sustainable agriculture, and therefore internal to their company. Those different interviews allowed us to understand the main reasons why those programs were implemented in the first place, the different steps throughout the development and implementation, and the main obstacles that companies were facing.

An interview framework was previously established to guide us, which covered the following aspects:

- Company's relationship with their wheat suppliers
- Definition of sustainability standards
- Transition towards sustainable sourcing
- Control of the sustainability criteria
- Overview of the program's results and main obstacles

The details of the exact questions can be found in the annex of this thesis.

Interviews lasted on average 40 minutes and were recorded and documented. Similar questions were asked to the respondents: our interview framework served as guidelines, but reality sometimes deviated according to the respondent's sensibility and their vision of sustainable agriculture. The four respondents had not the exact same position within their own company but were all in charge of programs linked to sustainable agriculture. Their exact position within the company and their organizational title will be detailed in the analysis as it implicitly underlines the importance of sustainable agriculture in the organization.

4.1.3. Limits of the research methodology

Some limits of our research methodology must be highlighted before entering in the details of the results.

The first limit regards the sampling size. As a matter of fact, analyzing four different programs is not enough to be able to generalize a framework or give relevant managerial recommendations. The huge variety of existing standards we found out about in our literature review is not entirely represented in our four cases, we could even say that the four cases presented a lot of similarities in their approach. Those similarities allowed us to explore in details some success factors or some obstacles but did not give the opportunity to fully grasp the organizational diversity which exists and was underlined many times in the literature review.

The second limit of our work which must be underlined regards the quantity of information we had access to for the different cases. First, we did not get access to the same amount of information for each case: for instance, we did not get the opportunity to interview someone from Barilla. We still took the decision to study the case because it presented relevant characteristics, but the following analysis must be read keeping in mind that it was not based on the same kind of information. Second, the respondents we had the chance to interview all occupied the same organizational position (Sustainable Agriculture manager, or equivalent organizational position) and due to time constraints, we did not get the chance to interview someone else in the company. A cross-functional interview would have given us the chance to contrast points of view and thus elaborate an analysis which would have been more objective. However, when asked to the respondents who else within the company could have answered our questions and provided a relevant point of view, it was often underlined that there was no one else able to give a comprehensive opinion on the issue under study. Indeed, the framework which was elaborated to guide us through the interview after having deeply analyzed the scientific literature on the subject tackled cross-functional issues and only a person overseeing or at least working hand in hand with different departments (purchasing, marketing, etc) could have answered it. To contrast points of view, we would have needed to interview more people which would have given inputs on a precise aspect of the issue under study (for example, the purchasing department might have shed light on the relationship with the suppliers but not on why a specific standard was chosen). Finally, we encountered logistic obstacles during our research study. It is recommended that the selected case study sites should allow the research team access to the group of individuals, the organization, the processes or whatever else constitutes the chosen units of analysis for the study (Giroux, 2003). However, since three out of the four companies are based in France and the fourth one did not answer our interview request, a physical access to the sites was not possible.

The third limit of our study is inherent to the choice of qualitative data, which provides subjective data, as the analysis is based on semi-directed interviews where the respondents are asked to express their own point of view.

4.2. Cases overview

The main sources for this part include the different companies' websites, as it was not asked to the respondents to describe their company. For each company, we attempted (1) to give a brief overview of the company history, key figures, (2) present the different commitments in terms of environmental sustainability of both the company under study and the parent company, and (3) understand how the sustainable wheat sourcing program fits into this sustainability approach.

We made the choice to put the sustainability commitments of the four companies under study in the context of its parent company's commitments as we deemed that it was necessary in order to grasp the company's maturity in terms of environmental engagement.

4.2.1. LU and the *Harmony* program

Brief overview of the company

Lefèvre Utile, better known by the initials LU, is a manufacturer brand of French biscuits, emblematic of the city of Nantes². The brand is now part of US confectionery company Mondelez International since 2007, after its acquisition from Groupe Danone. LU is today considered as an emblematic company of French food industry and is the leading company on the French market in terms of sales. However, Louis Lefèvre Utile, the company founder, always intended to manage his company as a family business, where employees are the driving force of production, but also of innovation and improvement. Today, although the factory staff has significantly decreased, employees still occupy a privileged place within the company.

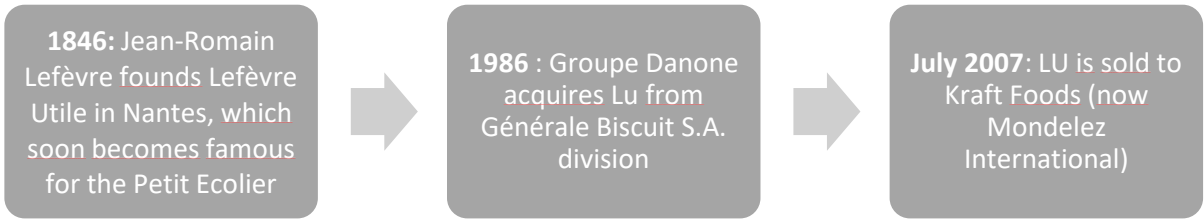


Figure 11 - Key dates in LU history (Source: the author)

In 2019, Lu is the first French biscuit manufacturer with more than 35 brands (Prince, Petit Ecolier, Belvita, Pépito, Belin, Mikado, ...).

<p>Lu Key figures in 2014:</p> <ul style="list-style-type: none">• 883 billion of euros of sales revenue• More than 3000 employees• Market share: 20,3% (in terms of value)• 9 sites on the French territory

²The sources include the company's website (www.lu.fr) and Harmony's website (www.harmony.info)

Mondelez International and its sustainability policy

LU has been part of Mondelez International since 2008. To understand the current position and philosophy of LU, some background elements on Mondelez International is needed³.

Mondelez International aims to “*build the best snacking company in the world*” with 2017 net revenues of approximately \$26 billion. Mondelez International is a world leader in biscuits, chocolate, gum, candy and powdered beverages, featuring global Power Brands such as Oreo and Belvita biscuits, Cadburdy Dairy milk and Milka chocolate, and Trident gum.

Mondelez sustainability policy is called “Impact for Growth” and organized around four different axes:

- (1) Agricultural supply chain:** this pillar includes some initiatives on key commodities for the company like cocoa and wheat, for which Mondelez International took significant action (Cocoa Life program concerning cacao, which aims empower more than 200,000 cocoa farmers in Cote d’Ivoire, Ghana, Indonesia, Brazil, the Dominican Republic and India; and the Harmony program concerning wheat which will be our main point of focus in the next part of this thesis.) This strategic pillar also includes securing key raw materials such as palm oil.
- (2) Responsible sourcing.** Mondelez International is working with thousands of suppliers, consultants and business partners around the world, and therefore the company laid out its expectations to their direct suppliers with the **supplier contract provisions** and **supply chain transparency statements**.
- (3) Environmental footprint.** To understand the environmental challenges it faces, Mondelez started by assessing the company’s total land, air and water footprint from farm to fork, by using LCA (Life Cycle Assessment). The LCA is updated annually, and insights from the annual reviews shape the company’s priorities, goals and efforts for the upcoming year. Mondelez International recognizes that our global food system is facing a complex set of challenges – including extreme weather patterns and climate change, as well as biodiversity loss, shortages of clean water and other resources, and the growing competition for land. Therefore, the company focuses on reducing the greenhouse gas impact of their operations and supply chains, as well securing supplies of key ingredients by helping farmers adapt to climate change.
- (4) Humanrights:** Mondelēz International complies with all applicable laws in the jurisdictions where we operate and subscribes in principle to the United Nations Guiding Principles on Business and Human Rights (UNGPs).

³ The source used for this part is Mondelez’ website (<https://www.mondelezinternational.com/>)

Harmony program

This part aims to give a quick overview of the program before studying in details its implementation in the next chapter. As the program was first launched on the LU biscuits, **we will first and foremost focus on understanding how sustainability criteria were implemented for LU biscuits, and then give an overview of the obstacles Mondelez met when developing the program on the other brands.**

The company uses the following statement on its website to describe the Harmony program: “*As bakers, wheat is our most critical ingredient and, because we use so much of it, we are able to drive meaningful impact in how it is farmed. Through Harmony, we’re changing the way wheat is grown and harvested.* “. Therefore, Harmony is a partnership with local farmers located as close as possible to Mondelez’s biscuits factories. The Harmony farmers receive a premium to apply a demanding charter of better farming practices, the Harmony Charter, to grow wheat in a sustainable way that helps prevent the usage of pesticides and fertilizers, preserve water and soil, and reduce carbon emission. The Harmony charter also contains specific practices to enhance biodiversity.

To date, Harmony program, which has been extended to other brands than just LU, includes 1700 farmers, 13 millers and 21 cooperatives in France, Spain, Poland, the Czech Republic, Belgium and Italy; and it represents 39 000 hectares of Harmony wheat sown each year.

4.2.2. Blédina – towards regenerative agriculture

Brief overview of the company

Blédina is France’s leading group in terms of baby foods, with 54% of the market shares in 2012. It is a subsidiary of Danone’s group⁴.

In 1881, Jacquemaire and Miguet, both pharmacists in Villefranche sur Saône, partnered to open a laboratory of fortifying food products. In 1906, Miguet created a cereal pudding, the “Blédine”. Once diluted in water in a baby bottle and heated, this wheat-based flour was created for lactose intolerant babies. The Blédine rapidly becomes a commercial hit and offers better protection against child mortality. Jacquemaire’s company changes its name in 1962 for Blédina; three years later it is acquired by the Société des Eaux Minérales d’Evian, led by Antoine Riboud, which is now known as Danone group.

Today the company sells a wide range of products, all for infant nutrition, and the Blédine accounts for only 6% of the company’s sales. Historically implemented in Villefranche sur Saône, the

⁴The main source used for this part is Blédina’s website (<https://www.bledina.com/>)

company has three production sites: one in Villefranche for the cereal transformation. The Brive-la-Gaillarde based factory is specialized in fruits and vegetables products while the Steenvorde based factory is for the milk production. In 2010, the company had 1500 employees.

Blédina's key figures in 2017:

- 665 billion of euros of sales revenue
- 1400 employees
- Baby food market share: 49,3% (in terms of value)
- 3 production sites on the French territory
- A diverse range of products (fruits and vegetables baby food, fish and meat baby food, cereals, biscuits, yoghurts, etc)

It is relevant to note that Blédina is subject to the European regulation on baby food, which sets strict criteria on nutritional composition and safety of foods specifically manufactured for infants and young children. The composition and labelling of infant formulae are therefore strictly monitored, in particular regarding pesticides residues⁵.

Danone's position on sustainable agriculture

As part of the Danone's group, Blédina shares its commitments and vision on sustainability. It is relevant to note that Danone is often considered as a leader in terms of sustainability. Regarding climate change's aspects, Danone acknowledges that its businesses are directly linked to nature and agriculture and that climate change impacts natural cycles of water, soils, biodiversity and ecosystem services that play a vital role in the food system. It is mentioned on some company's statements that forests and agriculture ecosystems are essential to the future of our climate and that the company aims to co-create "carbon positive" programs to sequester more carbon in agriculture, forests and natural ecosystems. Danone maintains relationships with over 14,000 farmers worldwide (*"Agriculture is at the center of a number of major challenges today, from economic development and climate change to water scarcity and biodiversity loss."*)

In November 2017, Danone announced its intention to sharpen its focus on **regenerative agriculture**, which rests on three pillars⁶:

⁵More information can be found on the European Commission's website (https://ec.europa.eu/food/safety/labelling_nutrition/special_groups_food/children_en)

⁶Danone's commitments on regenerative agriculture can be found on the company's website (www.danone.com/impact/planet/regenerative-agriculture.html)

- (1) **Protecting soils** by promoting agricultural practices which enhance soil organic matter content and help sequester more carbon, such as using rotating crops, reducing soil tillage, and using crop residues as compost. Danone engaged with external partners and joined for instance the 4 per 1000 initiative, launched by the French government during the COP21 to catalyze collaboration on soil health and soil carbon sequestration.
- (2) **Empowering a new generation of farmers.** Danone acknowledges how indispensable the work of farmers is: they are the lead actors in a transition to regenerative agriculture.
- (3) **Promoting animal welfare.** Since animal production (milk) is key for Danone, whose sales are largely generated by dairy production, emphasis is given to this particular issue, but we choose not to go into details since our study focuses on wheat sourcing.

From the analysis of Danone's climate policy, we conclude that (1) by giving a precise vision of what sustainable agriculture (ie. Regenerative agriculture), Danone takes a strong stance in the farming world, and (2) the company's relationships with the farmers is largely emphasized.

Blédina's sustainability policy

Blédina translated the group's guidelines in terms of sustainability in order to apply the stated commitments to its own activities. The main relevant characteristic of Blédina compared to Danone is its obligation to be compliant with baby food regulation in Europe. Here are four of Blédina's environmental and sustainability commitments:

- (1) **Sustainable agriculture:** Blédina is committed to implementing "sustainable farming methods which respects ecosystems and natural resources". A seven-person team is dedicated to the audit of farmers, and the organization of learning sessions around soil, water and biodiversity.
- (2) **Local sourcing:** Blédina is striving to source the maximum of its raw materials in France.
- (3) **Rigorous selection of raw materials:** selected materials must comply with regulation on baby food.
- (4) **Decreasing the company's environmental and water footprint.** Blédina is committed to implementing action throughout its supply chain and in its factories to decrease its impact on the environment (eco-conception of its products, reduction of the factories' energy consumption, ...).

It is also relevant to mention that Blédina was recently (April 2019) certified as a B-Corp company⁷. The certification is based in five pillars, one of them being the implementation of rigorous environmental standards. In the listed action that Blédina had to implement to obtain the certification, the advocating of a more respectful and sustainable agriculture, meaning regenerative agriculture, is mentioned. As of today, it is the biggest French company to be certified as a B-Corp for its sustainable development and corporate responsibility actions.

Since 2017, Blédina also sells a range of organic products, among them a biscuits product line. As a matter of fact, it is mentioned on Blédina's website that the company strongly supports the development of organic agriculture in France, by implementing a collaboration with Miimosa, a crowdsourcing platform supporting innovative farming project. The collaboration between Blédina and Miimosa is based on a simple mechanism: for each euro invested by a citizen/consumer on the platform, Blédina contributes one more euro to support the development of organic agriculture.

Regarding its wheat sourcing, few elements are mentioned on Blédina's website. We can attribute this to the fact that wheat is not considered as a critical raw material since biscuits are only one of the range of products offered by the company: as a matter of fact, some raw materials such as fruits and vegetables or milk are considered as more critical because they are subject to higher safety concerns than wheat, which can be conserved for a longer period of time. It can also be attributed to the fact that wheat is not the most visible raw material, in contrast to Lu's biscuits (in which wheat is the number one material).

4.2.3. Jacquet Brossard

Brief overview of the company

Jacquet was originally a family bakery, created in 1885, which grew bigger and was acquired in 1995 by Limagrain. Brossard, on the other hand, was also a family bakery created in 1931. It was acquired by an American company in 1968 and acquired back by Saveurs de France in 2001, and Limagrain in 2011, which was the origin of the group Jacquet Brossard⁸.

Therefore, Jacquet and Brossard are major and complementary brands on the French industrial baked products market. Jacquet is specialized in all types of breads (sandwich bread, loaf bread, ...) while Brossard is specialized in cakes, individual or shared (the company's flagship brand is

⁷ B-Corp's statement on Blédina certification can be found on its website (<https://bcorporation.net/directory/bledina>)

⁸The main source of information for this part is the company's website (<http://www.jacquetbrossard.com/>)

Savane, but Brossard also sells brownies, fruit cakes, crêpes, madeleines, ...). Bread accounts for 60% of the production while cakes and biscuits account for 40%. Figure 12 shows the turnover repartition by activity:

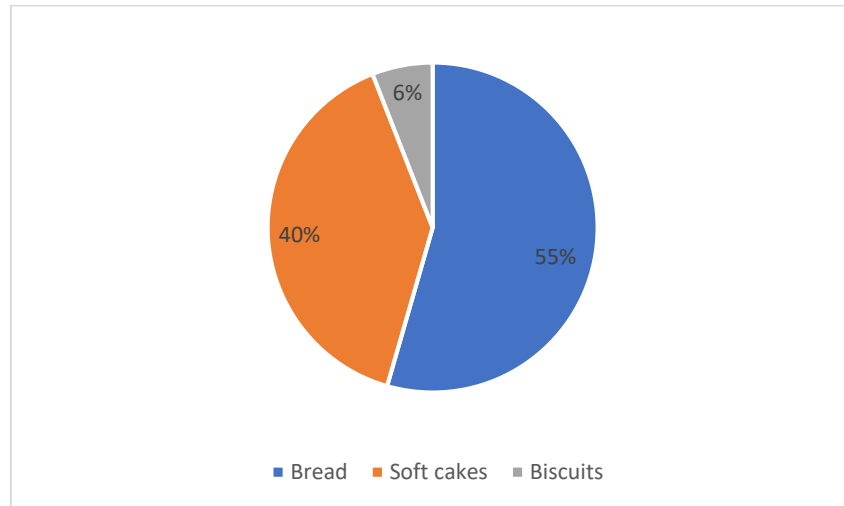


Figure 12 - Jacquet Brossard's turnover by activity

The company has 9 production sites: 6 in France⁹, 2 in Belgium (waffles production) and 1 in Brazil. Being a subsidiary of Limagrain's international farming cooperative, Jacquet Brossard has a direct relation with the seed industry and the farmers producing wheat, which allow to have control over the whole cereal chain, from the seed to the bread or biscuit. Jacquet Brossard counts 1300 employees in 2019.

Jacquet Brossard's specificity: a subsidiary of Limagrain, a powerful farming cooperative

Limagrain is an international agricultural cooperative group, specialized in field seeds, vegetable seeds and cereal products¹⁰. Founded and managed by French farmers, Limagrain is the European leader for functional flour through Limagrain Céréales Ingrédients, 2nd largest French baker and 3rd largest French pastry maker through Jacquet Brossard.

The cooperative model can be defined as an association of autonomous persons, voluntarily reunited to fulfill aspirations and economical common needs. The main characteristic of a cooperative is that the power is exercised on the governance model "one man = one voice".

Limagrain group is organized around three main core businesses:

⁹The production sites in France are located in Pithiviers, Langonnet, Sens, Saint-Beauzire, and two are in Clamecy

¹⁰ The main source for this part is the company's website (<https://www.limagrain.com/>)

- **Field seeds**, which have always been very much part of Limagrain’s historical core business.
- **Vegetable seeds and garden products**: the Vegetable seeds targets the professional markets of growers and canners, whereas the Garden products activity proposes seeds of different flower and vegetable varieties to amateur gardeners.
- **Bakery and Cereal Ingredients**, which is the activity we are mainly interested in. It constitutes a fundamental asset for valorizing the agricultural production of its members. Cereal Ingredients is a leader in functional flours, and with Jacquet Brossard Limagrain is the first industrial bakery pastry in France.

In 2017, Limagrain counted more than 10 000 employees.

Therefore, the main specificity of that model which is relevant for our study is that most of the wheat produced by the Limagrain farmers is used directly in the group’s processed products, among others Jacquet Brossard’s biscuits and cakes. As a matter of fact, Jacquet Brossard’s mission is “*valuing the farmers work by offering enjoyable times to the consumers*”, which underlines the significant place of farmers at the heart of the company.

The different phases of the wheat chain is represented in Figure 13.



Figure 13 - Limagrain's wheat chain (Source: the author)

Limagrain and Jacquet Brossard’s key figures (in 2015)

- 2000 farmers members of the farming cooperative
- 700 farmers which grow wheat for Jacquet Brossard’s bread, cakes and biscuits
- Limagrain’s turnover: €2,6 mds
- 10,000 employees in Limagrain
- 1300 employees in Jacquet Brossard

Jacquet Brossard's sustainability policy

Limagrain does not mention any sustainability policy on its website but a strong emphasis is put on the cooperative model described above, which is considered as one of the group's strength.

Concerning Jacquet Brossard's sustainability policy, it is called EPI (which stands for a wheat corn in French), which shows the importance of the raw material for the company. It is based around three pillars:

- *Epanouissement* (**Fulfillment** of the employees), including actions guaranteeing safety, health, and development to the employees.
- *Production respectueuse* (**sustainable production**), including actions on sustainable production and sustainable purchasing, raw materials, transparency and ethics. This is the aspect we will be focusing on in the next chapter.
- **Innovation**. This pillar includes actions on nutritional improvement of the products, and providing information and educating the consumer.

From this company's overview, we can conclude that there is a strong emphasis on integrated activities throughout the whole wheat supply chain: Limagrain asserts that its cooperative model offers less intermediaries, more visibility and more transparency on the raw material within the whole chain.

4.2.4. Mulino Bianco

Company overview

Mulino Bianco is a bakery products company¹¹. In 1971 the famous pasta products company Barilla was acquired by an American company, and because of political and economic factors the top management pointed resources on diversification. This led to the creation of the Mulino Bianco brand in 1974 to distinguish the bakery products from the pasta products. As explained in the previous chapter, pasta products and bakery products are both made out of wheat but it is a different kind of wheat: pasta is made of durum wheat while biscuits are made from common wheat. Today, Mulino Bianco sells more than 22 lines of products: aside from biscuits, it includes snacks, cakes and breads, all of them products with simple recipes. This is the most well-known and most purchased brand of sweet snacks in Italy, characterized by a high quality, home-made style and healthy food image. Countries directly bordering Italy, such as France, Austria and Switzerland, make some of these products available on a small scale. In other countries these products can be found in small typical stores but with limited variety and quantity and at an increased price.

¹¹ The main source used for this part is the company's website (<https://www.mulinobianco.it/home>)

The company has 7 production sites¹² in Italy and one in France. Following controversies on the wheat provenience¹³, Barilla decided to disclose all the information on its website concerning Mulino Bianco's sourcing¹⁴. Therefore, we were able to know that Mulino Bianco purchases 44% of its soft wheat in Italy and the rest in different European countries (10% in Austria, 13% in Bulgaria, 11% in Hungary, 8% in France, 6% in Germany). All the wheat is then transformed in wheat flour by Italian millers.

Barilla's key figures (in 2015):

- Barilla: more than 8300 employees
- Barilla's turnover: 3.4 billion euros
- Leader in Italy for bakery products with Mulino Bianco

Barilla's sustainability policy

Barilla group is an Italian family-owned food company¹⁵. Established in 1877, it is now an international group present in more than 100 countries. The group controls Barilla (multinational pasta maker), Mulino Bianco, and Pavesi. The group produces many kinds of pasta and is the world's leading pasta maker. Mulino Bianco's activities make Barilla the leading seller of bakery products in Italy.

Barilla defines its mission using the following motto: "Good for you, good for the planet".

- **Good for you** refers to the company's nutritional commitment: it is explained on its website that nutritional profile of existing products is continuously improved; and that the company aims to promote healthy lifestyle and sustainable diets.
- **Good for the planet** is the pillar that we are most interested in within the scope of our study. Barilla claims to implement a sustainable supply chain, from field to fork; which means (1) improving the efficiency of production processes in order to reduce GHG

¹² The production sites in Italy are located in Ascoli Pieno, San Michele (Ravenna), Castiglione delle Stiviere (MN), Cremona, San Nicola di Melfi, Novara and Rubbiano. The French production site is located in Onnaing.

¹³The source of this information can be found here: <https://ilfattoalimentare.it/pasta-barilla-etichetta-grano-duro.html>

¹⁴ The source of this information can be found here: <https://www.mulinobianco.it/per-darti-il-meglio/ingredienti/farina>

¹⁵ The main source used for this part is the group's website (<https://www.barillagroup.com/it>)

emissions and water consumption, and (2) to promote more sustainable agricultural and farming practices for all of the Group's strategic supply chains.

It seems relevant to note that wheat has always been considered as a strategic raw material by Mulino Bianco. This can be seen in the communication throughout the time: the main values and elements communicated in the different advertising are tradition and family, natural ingredients of good quality, and healthy products (Colli, 2012)

La Carta del Mulino: Mulino Bianco's sustainable wheat sourcing program

La Carta del Mulino is the name of Mulino Bianco's sustainable wheat project. It was launched in April 2019 and consists in a 10 rules charter for sustainable farming of wheat. The aim is to (1) improve quality of the products, (2) support farmers community labour and (3) preserve biodiversity. Today, the purchasing of sustainable flour represents only a small percentage of the raw material purchased by the company (although the website does not indicate how much) but the aim is to develop the program. As a matter of fact, the company aims to reach 5000 farmers by 2022, which would represent 60 000 ha dedicated to sustainable wheat cultivation, whereas 2 000 ha would become dedicated to natural flora and fauna. It is mentioned on the company's website that the development of the project will be in France and in Italy, both countries in which Mulino Bianco's biscuits are produced.

The program was developed in collaboration with the WWF, l'Università di Bologna, l'Università della Tuscia; the role of the different stakeholders will be analyzed in the next chapter.

The program also aims to reward the participating farmers by offering them a financial compensation, in order to compensate for the lower yield; thus, the company underlines the economic and environmental sustainability of the project.

Finally, the development of organic agriculture has also been talked about within the collaboration with the WWF: as Mulino Bianco already offers organic products lines, the collaboration with WWF will aim to extend those lines and inform the consumers about the benefits of organic agriculture.

From the company overview, several elements can be highlighted:

- (1) Mulino Bianco is a brand controlled by a multinational group, in which wheat (be it soft wheat or durum wheat) is considered as a strategic resource
- (2) The program launched recently reflects the importance of this resource. Carta del Mulino is an innovative program which involves many different stakeholders and was promoted actively during the month of April 2019.

We will analyze in the next chapter what is beyond this communication elements and try to understand what the key elements of the implementation of this sustainable sourcing program are.

From the overviews of the three companies, we can build the following summarizing table, which identifies the main relevant points which will be useful to keep in mind for the next chapters:

Criteria	LU	Blédina	Jacquet Brossard	Mulino Bianco
Typology of products sold	Biscuits	Baby food (fruits and vegetables, meat and fish, biscuits, dairy products)	Biscuits, cakes, bread	Biscuits and snacks
Size of the company	3000 employees	1400 employees	1300 employees	8000 employees in Barilla
Zone of sourcing and numbers of wheatsuppliers/millers/factories	-Sourced in France - 9 factories	- Sourced in France but not only (Spain, ...) - 3 factories	-Sourced in France (Limagne) -9 factories	-Sourced in Italy (44%) and other European countries -7 factories
Existing sustainable sourcing program?	Yes, implemented since 2008 (<i>LU Harmony</i> , and then <i>Harmony</i>)	Yes, no formal date of implementation (no special name and not wheat focused)	No specific program	Yes, launched in 2019 (<i>La carta del Mulino</i>)
Existing of organic line of products	No	Yes, since 2017 (<i>Les Récoltes bio</i>)	Yes	Yes (biscuits and crackers)

Figure 13 – Summary of the companies overview (Source: the author)

4.3. Intra case finding analysis

■ Lu Harmony

Presentation of the informants

As part of this master thesis, we had the opportunity to interview two major stakeholders in the implementation of the Harmony sustainability program implemented first and foremost by LU brand, and in a second stage developed by the Mondelez group.

The first interview was conducted with Elodie Parre, who oversaw sustainable agriculture when Lu Harmony was first launched. The second interview was conducted with Flora Schmitlin, who is now in charge of the Harmony program development in Europe. Both interviews were very rich and provided us a lot of information to analyze. The information collected during these interviews was completed by secondary data, that is to say information found on different websites: Harmony website, Mondelez International website, but also video interviews and press interviews from reliable sources. LU is the case for which we had the most information: we were able to implement data triangulation, as recommended by Yin (1981) and thus construct more objective information. Overall, we realize that the information collected from the different sources overlap. The interview with Elodie Parre provided us some insights on the construction of the program and why and where it started but she pointed out the fact that her testimonial might not be fully up to date, while Flora Schmitlin's interview allowed us to gather more information on the current state of the program and to understand what vision the company has for the future of the program.

LU wheat sourcing model

Before giving any information on the sustainable agriculture program, it is important to understand how the wheat supply chain is organized within LU production chain.

As found on the LU website¹⁶ - the information was then corroborated by both informants - LU biscuits are made in ten different factories, located everywhere in France, and each of them specialized in one or more line of products. Wheat needed to the biscuits' fabrication is produced around the factories. Respondents clarified the fact that for different lines of products, different wheat flours are needed.

¹⁶The mentioned information can be found on LU's website (www.lu.fr)

The informants confirmed that supply chain is organized as follows:

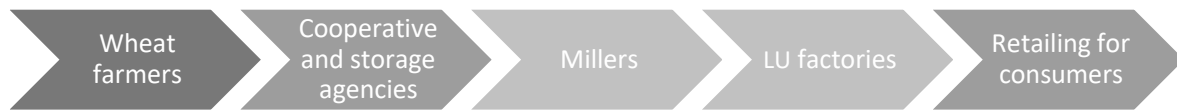


Figure 14 - LU's wheat chain (Source: the author)

Therefore, LU purchasing department has in general no direct contact with the farmers. As a matter of fact, Elodie Parre described the cooperative and the storage agencies as “*LU's eyes on the field*”, which then provide inputs to LU's employees (in particular in the purchasing department) on suppliers' farming techniques, difficulties that they face, etc.

Harmony: the birth of an innovative program

As stated by Elodie Parre, the program was launched in 2008. She underlined the importance of how the program was born as she deemed it was an important element of background. The respondent explained that following the acquisition of LU by the American group Kraft Foods, there was a certain feeling of uncertainty and distrust of the LU employees towards the direction that would be given to LU's strategy (“*At that time, Kraft Foods was considered by LU employees as a giant multinational, very far from LU and Danone's key values*”). Therefore, a series of workshops was organized back then by LU managers, involving all departments and all levels of staff, to understand what employees were expecting from LU, what were LU's key values and how they could place those values at the heart of the company's activities (“*There were two main challenges at the time: finding a way to give meaning to employee's work, and transmitting LU's main values up until the consumer*”).

From this series of workshops, different directions were identified by LU's employees:

- (1) It was acknowledged by the employees that wheat was the main ingredient of LU's products and therefore, a responsible and sustainable approach should be implemented in its cultivation. This conclusion led to the implementation of the Harmony program.
- (2) The nutrition profile of the different LU products was one of the main challenges for the company and therefore should be constantly improved.
- (3) The environmental and water footprint should be carefully monitored and decreased.

Therefore, we can argue that the Harmony program emerged from LU core values. As it was launched in 2008, enough time passed to be able to analyse it and draw some relevant conclusions from its implementation, thus it is a particularly interesting case to study.

Involved stakeholders in the definition and the implementation of the sustainability standards

The main stakeholders involved in LU's sustainable agriculture program were both respondents (Elodie Parre and Flora Schmitlin). It is relevant to note that the scientific and technical expertise of the sustainable agriculture manager at the time of the program's launch (which was Elodie Parre; she has a dual academic background both in biology and sustainable development management) was crucial in the definition and the implementation of the program. As a matter of fact, she stated herself that she had the perfect background to be able to communicate on one hand with the farmers, the suppliers and the external scientific stakeholders and on the other hand with consumers and journalists (*"I was at the right place at the right moment. I had the ability to act as an interface between the suppliers and the consumers"*). The second person in charge of the program, Flora Schmitlin, who took over the position in 2014, did not have the same technical and scientific expertise but had strong marketing and communication skills. This reflects the shift of the challenges Harmony program faced at the time: once the scientific criteria were defined and implemented, the main difficulty LU was experiencing was how to communicate this added value to the consumer.

Other than both the respondents, other internal and external stakeholders were involved in the process of the definition and implementation of a sustainable sourcing program. As a matter of fact, Elodie Parre explained that it all started by a concertation with all the involved stakeholders (*"We sat around the table and asked ourselves: what are the main challenges for wheat farming?"*). The role of the different stakeholders is detailed below:

(1) Internal stakeholders

Different internal stakeholders were involved in the definition of the sustainability criteria and are still involved in the governance process of the program. Those stakeholders are:

- *The purchasing department.* Elodie Parre underlined that there was a shift in the purchasing function: along the development of the Harmony program, the department had to work with the whole wheat chain and not only with the millers anymore. (*"Before, they were only trained to purchase specific wheat flours at the right price and at the right volume"*).
- *The quality department:* with the implementation of Harmony, a full-time job was created in the quality department, which was in charge of the Harmony charter (this includes organizing the audits, measuring the key indicators, improving the charter year on year).
- *Research and Development department:* collaboration with the R&D department was key as they worked on testing varieties which would be more environmentally friendly (varieties which would require less water input for instance).

- *Industrial processes* had to be rethought. As a matter of fact, with the implementation of Harmony program, LU had less flexibility on its volumes, and thus they had to make sure all the wheat flour purchased which met the Harmony requirements was correctly used.

(2) External stakeholders

Although Elodie Parre had some scientific and technical expertise on sustainability agriculture related issues, she was aware at the time of the program's launch that external expertise would be needed and that being challenged by stakeholders would be critical to the definition of the criteria (*"We solicited external partners to challenge us on the defined sustainability criteria"*). Therefore, external stakeholders were involved in the process of the definition of sustainability standards:

- Millers, cooperatives and farmers are part of the project steering.
- **Noé Conservation**, which is a non-governmental association aiming to protect biodiversity through programs to maintain endangered species and their natural habitat. Noé Conservation assisted LU on the definition of biodiversity conservation practices. Elodie Parre mentioned that they chose to work with Noé Conservation instead of a bigger partner (she talked about WWF or FNH–*Fondation pour la Nature et l'Homme*) because they focused on "ordinary biodiversity" (*"we wanted to work on the conservation of the bees that we see every day, and not polar bears who are at the other part of the world"*).
- **Réseau Biodiversité Abeille**, which is a non-governmental organization acting in support of pollinators and their ecosystems. They federate actors such as farmers, beekeepers, scientists, public administrations and companies around projects aiming to preserve biodiversity. Their role was to train LU staff on the biodiversity issue.
- **Agrosolutions**, which is a consulting firm acting alongside farmers, food chains actors and public actors. They have a strong agricultural and agronomic stance. They supported LU in the technical definition of the sustainability criteria.

Flora Schmitlin summarizes the interactions with the external stakeholders by stating that "*[LU] continue to challenge them so that they continue to challenge [LU] on their sustainability criteria"*. Today, with the evolution of the program, new stakeholders are involved in the process: Flora Schmitlin, which is now in charge, cites among others the ADEME (French energy agency) and the government.

Both informants mentioned the importance of education and sensibilization to the stakes of sustainable agriculture, both internally (education of the company's employees) and externally (education of the suppliers, but also the consumers).

Concerning the governance structure, Elodie Parre mentioned a steering committee involving all those external and internal stakeholders, which gathers regularly to review the project's progress.

Sustainability standards

From the concertation with internal and external stakeholders emerged a charter defining the sustainability standards and requirements that suppliers would have to adopt in order to be part of the Harmony program.

The following citation from the respondent described very well the charter that emerged from this concertation: *"The charter is based on key integrated agriculture practices applied to wheat. To this, we added practices on biodiversity because we considered we had a real role to play on this level and that it was our main differentiation point. We called this chartered LU Harmony and we had to prove it was serious because we did not rely on any preexisting certification or standards that the consumer could have heard of"*. Therefore, **the underlying philosophy of the charter was based on integrated agriculture**, and a strong emphasis was put on biodiversity conservation. Elodie Parre explained that *"[They] were hearing a lot about greenhouse gas emissions, but the experts were telling [them] that biodiversity was the basis and that it was the real issue to work on"*. The respondent stated that back in 2009, it was not a common commitment. Consequently, LU needed to insist on consumers and supplier's education, since *"consumers did not even understand what biodiversity referred to, they associated it directly with greenhouse gas emissions"*.

A simplified version of the charter can be found on Internet (the entire framework can be found in the annex). It is based on 34 good farming practices, organized around 8 pillars:

- **The choice of production plots and the crop planting:** choice of seed which are best adapted to LU's biscuits, prohibition on the use of GMOs, crop rotation and intermediate crop to preserve soils, protection of local biodiversity (3% of the UAA is reserved for the introduction of flowers to attract and preserve pollinators)
- **Culture nutrition:** limitation, adaptation and strict control over the use of nitrogen applied to the culture. Some tools are made available to the farmers for them to adjust the dose of nitrogen.
- **Culture health:** limited phytosanitary treatments (they are allowed only if really necessary and must be strictly monitored), no insecticide allowed on the flower zone.
- **Irrigation management:** limited water inputs, justify and quantify all the inputs.
- **Waste management:** favor the correct collection of waste
- **Stock and transportation:** strictly monitor the stocking conditions to limit insect's invasion, proscribe chemical disinsectization.

- **Traceability:** Harmony wheat and non-Harmony wheat must be separated at all stages of the process and we must be able to trace it
- **Farmer:** provide the farmers all the necessary elements to understand properly the Harmony charter, train and sensitize the farmers to sustainable agricultural practices. Participation of the chief operating officer of the farm to information and training days

The vision of the Harmony charter is summarized on the website in one sentence: *“what guides us is agroecology, reducing inputs and favoring soils and territory biodiversity”*

To take precise commitments and to be able to measure precisely the impact of the program, key indicators were defined. For instance, for biodiversity, Elodie Parre explained that they chose to measure treatment frequency index, which measures the use of pesticides on farms and its evolution over time.

The stakeholders involved in the process made the strategic decision not to implement organic standards throughout their supply chain but to create their own sustainability standards. According to Elodie Parre, this decision was taken for several reasons:

- (1) The launching of an organic product line back in 2009 called *“La clé des champs”* which was a commercial failure (according to Elodie Parre). It was very expensive at that time to buy organic wheat and the wheat did not come from France. There was no organic wheat in France which matched LU production requirements in terms of volume and varieties.
- (2) LU’s desire to emphasize on criteria which were not the main focus of organic regulation (mainly biodiversity protection)

Elodie Parre claimed that *“[LU] could encourage the whole wheat chain towards practices which are virtuous and accessible to all. LU’s approach is an in-between approach”*

LU’s website explains the main differences between Harmony chart and organic requirements: *“(1) Harmony charter authorizes the use of phytosanitary products, justifying every intervention and (2) Harmony charter integrates agricultural practices in order to better preserve local biodiversity and being able to measure it”*

Another relevant point concerning the definition of sustainability standards is their constant evolution and improvement. Elodie Parre mentioned that from the beginning, it was clear that the sustainability standards were meant to evolve (*“The idea was to say that at the beginning we wouldn’t be able to cover everything, but we would have improved the criteria”*).

A few years after the creation of the program, when LU realize that the improvement progress was stagnating, they implemented a pilot farm, where they were experimenting different sustainable farming practices. (*“more advanced and innovative farming practices”*) Farmers who

were interested in going further than the Harmony charter could be trained and have access to some valuable information from this pilot farm. The information provided on the company's website¹⁷ enabled us to complete the analysis: it mentions that the pilot farm's action was built around the following principles:

- The experiments are conducted on several farms at the same time to provide an understanding of the specificities of the various soils; and the experiments are conducted during several years.
- During the experiments, key indicators are calculated, including economic indicators (yield, margin, ...), wheat quality indicators (weight, protein content, ...), agrochemical and biodiversity indicators (bee populations, soil biomass, ...).
- At the end of the experiments, the success and the difficulties faced throughout the process are exposed to the whole wheat chain.

For instance, the Terrena farming cooperative (one of LU's suppliers) conducted an experiment on the benefits of the cooperation between two species of wheat within the plot of land.

Flora Schmitlin completed Elodie Parre's testimonial claiming that in 2017, the charter was simplified because some of the requirements *"were becoming obsolete, mainly because the Common Agricultural Policy (CAP) evolved, and French regulation evolved too"*.

Finally, the charter evolution and improvement were supported by indicators which became more precise. Indicators calculated included emission of greenhouse gas, marine eutrophication, freshwater eutrophication, acidification. These precise calculations have two aims: on one hand, measure the impact of the program on environment to be able to assert whether the program has a positive impact, and on the other hand measure the impact of the program on farmer's margin to show that environmentally friendly farming practices don't necessarily involve bad economic results. Those indicators are still being developed by the company.

A shift in the relationship with farmers

During the implementation of the Harmony program, the relationship with the farmers changed. As explained above, the purchasing department used to work only with miller's composition and information about the wheat flour was the only information required (*"It is the only thing that we used to ask. We did not know anything about the flour provenience or the different kinds of wheat"*).

¹⁷The information mentioned can be found on the following website: https://harmony.info/fr-fr/home/_find-more/2018-HARMONY-Fermes_pilotes-FR.pdf

At the time of Harmony's implementation, the idea was to work with the whole wheat chain instead of working only with the millers. The informant underlined the innovative character of the project (*"It was something very new for us, we never did that before"*). This allowed LU to understand better the farmers' work and thus to gain expertise on the raw material purchased and the industrial processes.

Elodie Parre also mentioned that when the Harmony sustainable farming practices were implemented, farmers' work was compensated thanks to a bonus. The cooperative, which have the role of engaging and animating the farmers' community on the sustainable farming practices, also receive a bonus. However, Elodie Parre underlined the fact that *"the bonus was a good way to involve farmers in the program, but it was not enough to make them stay in the program on the longer term"*. Concerning the farmers' feedback on the program, Elodie Parre underlined that at first, they were scared that the different criteria may complicate their work but once they understood the reasons why LU was implementing the program, they were eager to participate. Some measures did not seem very relevant to them (for instance, Elodie Parre cited areas reserved to floral development), but with some time and training they acknowledged its importance.

One of the reasons why the farmers were enthusiasts about the program is that they could trace the destination of the wheat they grew (*"they could see what their wheat was transformed in. They felt part of a whole, they were involved"*). However, the other respondent, Flora Schmitlin, was more dubitative on farmer's reaction to the program: *"They usually think it represents too much time and too much money"*. We can see in this divergent opinion the different position both informant had: while Elodie Parre's job was to launch the program, Flora Schmitlin's role is to measure its impact and she may encounter more difficulties.

According to Flora Schmitlin, 70% of the contracts were renewed.

Control of the criteria

The informants mentioned two levels of control and interactions with the supplier once the program once implemented.

- (1) **Formal audits** carried on by a third-party supplier: LU implemented in collaboration with SGS ICS and Bureau Veritasan audit plan which included all the LU harmony practices. This control plan applies each year to 10% of the LU Harmony suppliers as well as to all the millers, in order to guarantee the whole wheat chain. Some farming practices were considered as disqualifying, which means that if the purchased wheat did not meet those particular requirements, it could be rejected as Harmony wheat and declassified as normal wheat, and thus the farmer does not receive its bonus.

(2) **Informal control practices.** Elodie Parre mentioned that “*flexibility and listening are essential*” and underlined the importance of understanding for each case what are the difficulties and the obstacles faced by the farmers.

Development of the program and obstacles faced throughout the process

Although from the very beginning of the program the aim was to reach 100% of the wheat volumes, Elodie Parre underlined that LU chose to start at a small scale and first implemented Harmony requirements with only one of their millers. This particular miller was supplying wheat flour meant to produce the flagship biscuits of the company (*Lu Petit Beurre*). This miller was already eager to improve its farming method and was already very close to LU (“*They were already sensitized to sustainable agriculture issues*”). Therefore, the program started with the 68 farmers who were part of this cooperative.

Once the program was started to be extended to the other lines of product, the main difficulties faced was to have similar requirements for everyone. As a matter of fact, LU was working with very different cooperatives: some of them were already very advanced on sustainable agriculture issues, while others, mainly the smallest ones, had never heard about certain practices and had difficulties implementing them. Therefore, it demanded a lot of more work and discussion with the farmers. Moreover, while criteria were getting more demanding, negotiations with the farmers became harder since they demanded a higher bonus.

When extended to other brands, the program was called Harmony and no more LU Harmony.

To give some figures, today more than 60% of the biscuits produced in France are produced with Harmony wheat and the program is extending in Europe. Within 2022, 100% of Mondelez biscuits will be made of Harmony wheat.

Challenges for the future of the program

The main challenge that the Harmony program faces today is to measure its impact. As stated above, Flora Schmitlin explained that precise indicators have been developed in the past three years to be able to concretely measure the impact of the program (impacts on emission of greenhouse gas, marine eutrophication, freshwater eutrophication, acidification). However, the respondent did not seem very positive about the results (“*We realized, after ten years of developing the program, that the program was not efficient enough in terms of environmental impact reduction.*”). Thus, the program is currently being “*reshaped*” in order to have an impact even more positive on the environment. When asked what this would mean concretely, Flora Schmitlin mentions a possible change in farmers’ financial compensation to prompt farmers to go even

further in terms of sustainable farming practices. She also talks about a possible performance obligation.

Among the obstacles to the program, Flora Schmitlin also underlines the fact that the consumers are not aware of Mondelez's actions in terms of sustainability and thus it does not guarantee Mondelez return on investment.

Finally, Flora Schmitlin mentions the fact that a lot of sustainable wheat sourcing program are developing everywhere, so it is not anymore a differentiation factor for LU and Mondelez, and thus they are looking for ways to stay ahead in terms of competitive advantage.

■ Blédina

Presentation of the informant and different sources of information

Juliette Rembert, the respondent, has overseen sustainable agriculture and biodiversity within Bledina since a year and a half. She has a dual academic background: after an agronomist degree, she had some experience in marketing and project management. Her one-year experience within Danone group in the Nature department, which is in charge of sustainable agriculture related issues and thus defined the group's regenerative agriculture requirements in 2017, allowed her to have a global view of the group's policy in terms of sustainable agriculture. This part also relied on Danone's website to have a more precise understanding of what regenerative agriculture refers to. As a matter of fact, Juliette Rembert indicated that the sustainable agriculture requirements are confidential, unlike LU's requirements. Therefore, this element must be kept in mind throughout the reading of the following chapter: we only had access to the formal guidelines communicated on Danone's and Blédina's websites concerning the definition of regenerative agriculture. It seems also relevant to point out that, compared to LU's informants, Juliette Rembert has a junior position and thus may have less hindsight on her experience.

Blédina wheat sourcing

Just as for LU, it is important to understand first and foremost Blédina's wheat chain. Wheat acquired by Bledina to produce biscuits and other cereal based products mostly comes from France, but a small proportion comes from other countries (Juliette Rembert cited Spain). This can be explained by the fact that regulation on baby food is very strict (as detailed in the previous chapter) and it is difficult to find enough wheat in France which respects this regulation. In some French regions, there are heavy metals in soil, which is not the case in Spain for instance. The informant underlined that in this case, she cannot give more detailed information since she is not part of the purchasing department.

Juliette Rembert also underlined that usually, she does not work in direct contact with the farmers but go through the cooperatives or the millers. We won't detail this sourcing model since it has

been detailed several times in the precedent chapters. However, the informant identified this lack of visibility as a major obstacle in the implementation of a sustainable sourcing program.

Birth of the program

Juliette Rembert underlined that *“the implementation of Bledina’s program in terms of sustainable agriculture comes from the desire to make sure the purchased raw materials were produced sustainably”*. Although this will to provide transparency and to maintain control of the company’s impact on the environment and the communities has always been in Blédina’s DNA, it had been later strengthened by Danone’s commitments. As a matter of fact, Juliette Rembert cited Danone’s environmental policy to justify the birth of Blédina’s sustainable sourcing program and she asserted that *“Within Danone, the question of the protection of sustainable development is central and the group has taken strong commitments on the issue.”* Within sustainable development, the informant includes soil protection and biodiversity protection. Thus, there is a strong will driven by the group, and Blédina’s commitments must be in line with the group’s commitments. The respondent showed clear consciousness that sustainable sourcing and environmental challenges are linked (*“We wanted to improve our environmental impact by sourcing sustainable products”*).

The definition of the sustainability standards followed three different phases:

- (1) At first, Blédina imposed to its farmers to implement the SAI international framework. SAI Platform (Sustainable Agriculture Initiative) of a global food industry initiative¹⁸, launched in 2002, aimed at supporting the development of sustainable agriculture worldwide. It collects and develops knowledge on sustainable agriculture. The Platform members share the same vision of sustainable agriculture: “the efficient production of safe, high quality agricultural products, in a way that protects and improves the natural environment, the social and economic conditions of farmers, their employees and local communities, and safeguards the health and welfare of all farmed species”. However, Juliette Rembert stated that the SAI framework is very vague on a lot of criteria and only has opened questions, thus Blédina deemed that the sustainable farming practices were not compelling enough and wished to go further in terms of sustainability (*“Internally, we were strongly advocating to go further on environmental criteria”*).
- (2) Blédina then implemented its own sustainability framework, with precise criteria and key indicators. Therefore, they included in the framework themes such as soil protection, water protection, biodiversity protection.

¹⁸ Information regarding the SAI platform can be found on their website (<https://saiplatform.org/>)

(3) In November 2017, Danone took commitments on regenerative agriculture. Therefore, an alignment of Blédina's framework on Danone's commitments was needed. The respondent asserted that Blédina was actually ahead of Danone's requirements in terms of sustainable agriculture, but that the framework still had to be rewritten to use the same terms than Danone's.

Involved stakeholders

Just like for LU, the informant mentioned two types of stakeholders: internal stakeholders and external stakeholders.

(1) External stakeholders.

To develop its sustainable agriculture criteria, Bledina received the help of technical institutes. The respondent mostly underlined the role of the French association "*Pour une Agriculture du Vivant*" (For a living agriculture), which we will mention as PUADV in the rest of this thesis. PUADV is a non-profit organization which aims to bring together all the actors of agriculture around an alternative farming approach, which is the living soils. As a matter of fact, their focus is mainly on conservation agriculture, which is central in Danone's definition of "regenerative agriculture". The role of PUADV was key in Blédina's work and is organized around three types of action:

- The support in the process of defining the standards of sustainable agriculture and the support when Blédina had to realign its criteria with Danone's regenerative agriculture commitments (the informant mentioned that it was only a question of realigning the terms used but that the vision was the same from the beginning),
- The creation of a pilot farm, in which volunteer farmers are testing new and innovative farming methods,
- The support in learning sessions dedicated to farmers on themes such as biodiversity, soil conservation, etc.

PUADV has an experimental approach.

On the other hand, Danone and Blédina's commitments towards regenerative agriculture were also supported by the WWF. The respondent mentioned both NGOs explaining that their role was to provide technical support and expertise regarding the implementation of sustainable agriculture; however, she did not mention the difference of function between the two NGOs.

(2) Internal stakeholders

The respondent mentioned the important fact that within Danone business units, Blédina was the first business unit to work on sustainable sourcing criteria. They were supported by the group

(the Nature team, which, inter alia, has the role of overseeing the implementation of sustainable agriculture criteria in the different business units). The involved teams were:

- SQM department, which refers within Blédina's organizational language to the teams in charge of quality. The SQM team is in charge to organizing the audits, among them the environmental audits. The SQM is the team which is the most in contact with the farmers.
- The purchasing department: the informant mentioned that she worked closely with this department.
- The factories and the operational teams: the informant underlined that their role was to make sure the criteria Blédina was implementing were actually achievable by the farmers.

Sustainability standards: regenerative agriculture

As stated before, we could not have access to the actual sustainability standards as it is confidential data. However, we were able to find some guidelines on what Danone intends by the term "regenerative agriculture", and here are the main inputs that can be relevant to our study: Danone recognizes in its statement the impact of soil degradation and the role of carbon capture and storage. The main measures that are involved in the definition of regenerative agriculture are:

- Inputs limitation
- Crop rotation
- Diminution of tillage (Danone is strongly advocating for a year-round crop cover).

Soil fertility is therefore central to Danone's reflection on sustainable agriculture.

When asked why Danone chose not to use organic criteria, Juliette Rembert explained that:

- In terms of sales, there would not be any interest to go fully organic. As a matter of fact, it would act as a repellent and prevent to reaching some customers which do not trust organic labelling for example ("*In terms of market, organic is very limited and we would lose customers*").
- As for being environmentally respectful, organic agriculture is not the solution to everything. Juliette Rembert drew an interesting parallel. She compares the energetic mix to the agricultural mix and asserted that tomorrow's agriculture should be a mix of different farming visions ("*In my opinion, tomorrow's agriculture is made of many different forms of agriculture [...] Organic is one of the solutions, but it is not the only one*").
- The third reason given by Juliette Rembert is that in France, the total organic area is very limited. Consequently, Blédina finds it very hard to find organic suppliers. Blédina committed to source 100% of French products for its organic range of products but today, there are not enough organic farmers for this commitment to be realized. The question

asked by Juliette Rembert is the following: *“should we go very far to source organic products, or should we source conventional products produced in France?”*

However, in 2017 Blédina started selling organic products, but it represents a small portion of the products.

Relationship with farmers

As explained above by the respondent, she and the purchasing team are not in direct contact with the wheat suppliers but with the millers or the cooperatives. She asserted that at the moment, they are trying to trace back the chain to get a closer relationship with the farmers. She identified this intermediary stage as an obstacle to the implementation of sustainable sourcing program (*“We have difficulties to get all the data from the farmers”*) and mentioned the fact that if we compare wheat to other raw materials, the work is much harder for wheat precisely because of those intermediaries. For instance, for fruits and vegetables, there is more visibility throughout the whole chain because there are little or no intermediary between the suppliers and the purchasing department. Therefore, Blédina can implement more easily sustainable sourcing criteria.

The relationship with the farmers is built around three pillars:

- Discussions on a case by case basis with the farmers, in order to make sure they understand and manage the key indicators.
- Training on themes such as biodiversity, soil conservation, etc, in order for farmers to be fully able to implement the sustainable sourcing criteria required by Blédina’s policy.
- Experimental tests on patches of land, from which we make conclusions.

The respondent underlined that most of the farmers were already sensitized to those subjects (biodiversity, water use reduction, etc) because they realize themselves that in terms of returns and product quality that it is important to protect soil and biodiversity. This quote from the interview illustrates very well the argument: *“When we arrive in the farms with our list of criteria on soil and biodiversity protection, farmers make fun of us because they have been working on those issues for 10 years”*.

Concerning financial incentives, Bledina offers to the farmers a compensation for the yield reduction, and also finances projects such as the implementation of hedges and hives on farms. The funds come from Blédina itself and not Danone’s group.

Control and audit

Concerning the control of the suppliers and the successful implementation of sustainability standards, the informant mentioned that it is done case by case. She works with the quality

department, get in touch with the farmer to understand his needs. It never happened before that a farmer went excluded from the process because never before a farmer completely refused to implement sustainable practices (*“It never happened before that a farmer said “I don’t want to change”*). As a consequence, it is not defined what should happen if a farmer does not meet the requirements.

■ **Jacquet Brossard**

Informant presentation and different sources of information

Marie Condy has been working within Jacquet Brossard for 2 years and a half. She arrived within Jacquet Brossard after the definition of the CSR priorities for the company, which were set up in 2015. Just like Juliette Rembert within Blédina, Marie Condy hasn’t much hindsight on Jacquet Brossard’s actions and commitments in terms of sustainability. Moreover, unlike Blédina or Lu, very few information can be found on the Internet since Jacquet Brossard did not yet formalize its commitments in terms of wheat sustainable sourcing. However, it still seemed a relevant case to analyze since it presents a very different level of maturity in terms of sustainability commitments and thus is an interesting point of comparison. It was even more relevant that it presented different organizational characteristics. As explained in the company overview, its belonging to a cooperative put the farmers at the heart of the group. It is therefore interesting to explore whether this organizational model has impact on the way the company sources its products and most of all in terms of sustainability; and to also understand what the company’s vision in terms of sustainability is.

It seems pertinent to mention at this point that Marie Condy, our respondent for Jacquet Brossard, underlined several times throughout the interview the fact that she lacked means to do her job(*“We do what we can with the means we have, but it is still a small company and the CSR approach is very new”*).

Jacquet Brossard sustainability strategy

Jacquet Brossard’s sustainability strategy focuses on a wide range of very different topics (from workplace wellness to environmental footprint and ecodesign)but the first emphasize is made on food waste reduction (*“We could not fight all the battles and food waste was a relevant issue for our company”*). However, as underlined in the previous chapter, the name given to the sustainability policy (EPI, which means wheat ear) shows the place of wheat within the company. Within the Sustainable Production cornerstone, a range of subjects is tackled: upstream farming, sustainable purchasing, products of French origin, diminution of food waste, green logistic. Overall, we can argue that sustainable agriculture does not occupy the same place within Jacquet Brossard than it

does within LU or Blédina, but it is considered as one of the projects CSR should work on, among many others. There is no clear link between environmental impact and sustainable sourcing. Finally, we have to note that at no point of the interview a scientific definition of sustainable agriculture has been mentioned.

Jacquet Brossard wheat sourcing and relationship with the farmers.

As mentioned in the company's overview, Jacquet Brossard's specificity is its belonging to a cooperative group. When asked about what consequences this organizational particularity has on the company, she explained that she felt that "*we belong to farmers: we work with them and for them*". She underlined the central position of the farmers in the company. She considered that it is a real added value for the company.

However, Jacquet Brossard does not have a direct contact with them. The contact goes through LCI (Limagrain Cereales Ingrédients), which is Limagrain's subsidiary which transforms wheat into flour. Indeed, 5 or 6 different wheats are needed to produce a wheat flour: Jacquet Brossard's requirements on the flour are transmitted directly to LCI, which handles the requirements directly with the farmers.

This has a strong impact on the way Jacquet Brossard sources its wheat: following the model that we described several times in the previous chapters regarding the wheat chain, farmers members of the cooperative produce wheat, which is then purchased by millers and transformed in wheat flour, and thus wheat purchased by Jacquet Brossard comes mainly from the cooperative farmers. However, although wheat to product Jacquet's bread come at 100% from the adherent, it only represents around 60% for Brossard's cakes and biscuits: for questions of volumes, prices and varieties, it is not possible for Brossard to source 100% of its wheat from its adherents. Consequently, the purchasing department has to buy wheat from other sources.

The respondent explained that the relationship between Jacquet Brossard and the adherents of the cooperative takes the form of 3-years contract, which guarantee a minimum price for a defined quantity to the farmers. Marie Condy underlines the fact that the particularity of the cooperative model is that "*this model protects the farmers from market variations*".

Overall, all the wheat is sourced in France.

Sustainability standards and involved stakeholders

Jacquet Brossard implemented a charter which promoted good agricultural practices among the farmers. There is also an existing code of ethics, which is signed internally by the purchasers. This charter was defined in collaboration between the group, with the farmers, the purchasing department, the marketing. However, the respondent explained that the marketing department is the project's owner. When asked what the role of the purchasing department is, Marie Condy

underlines the fact that they “*were victims of the world costs for raw materials*”. The pressure of wheat price is underlined as a bottleneck to the implementation of sustainable wheat sourcing, which would cost more. She also underlined that the role of the purchasing department was merely limited to “*save money*”. However, the respondent underlined that the purchasing director is fully sensitized and involved in a sustainable approach.

The underlying idea of this charter is to protect as much as possible soil and biodiversity. This charter is not implemented by all the farmers.

When asked about external stakeholders, the respondent stated herself that « *[Jacquet Brossard] is not mature enough on CSR issues to have recourse to external stakeholders. [They] try to do as much as possible by themselves* ». However, Jacquet Brossard works with external stakeholders on different issues, for example the French company Phenix concerning food waste reduction.

Finally, it appears that Jacquet Brossard’s activities are certified ISO 9001, which is a quality certification, but there is not mention of a ISO 14001 certification, which would be an environmental management system as explained in the previous chapter.

Bottlenecks preventing the shift to sustainable practices

The informant explained that the farmers practice a “*traditional agriculture, practicing ancient methods*”. Although the term has not been clearly defined, we understand that she refers to conventional agriculture farming methods. It is relevant to note that when asked about sustainable farming practices, the respondent directly named organic agriculture. She explained that she wished a transition towards organic products but that there is some resistance from the farmers. Nonetheless, a group was created within the farmers to exchange good practices regarding transition towards organic farming methods and some of them are already in the conversion stage.

The main bottlenecks identified from the conversion towards organic practices are:

(1) **financial investments** from Limagrain group: the respondent asserted that “*if the group does not take the decision and do not invest in this transition, it won’t happen*”. She underlined that “*organic is not really part of the group’s DNA*” and that they are “*very proud of their current practices*”.

(2) **conversion time**. She pointed out that conversion would take from 3 to 5 years and that it would not be possible without the group’s investments.

The informant underlined nevertheless that there is an organic range of products but that the wheat used during production does not come Limagrain’s farmers. In order to move towards more

sustainable practices, current used farming methods should be questioned, yet the farms are family domains and education is also transmitted within a family line (“*We must challenge farming practices that have been transmitted over many generations*”). The respondent only mentioned integrated agriculture at the end of the interview, explaining that it could be an in-between solution that would be accessible more easily than organic agriculture.

Finally, the informant concluded on this part asserting that some things are being done in terms of sustainable agriculture but that nothing has been formalized yet. Jacquet Brossard guarantees price to the farmers and quality to the consumer but sustainability is not yet part of the group’s DNA.

■ **Mulino Bianco’s carta del mulino**

Source of information

As the company launched its sustainable sourcing program in the month of April 2019¹⁹, logistic constraints made it impossible to interview the person in charge. However, the case was deemed very relevant for the phenomenon under study as it presented a case of recent implementation of a sustainable sourcing program, with a company defining its own private standards regarding sustainability, but in a whole different context – the Italian context. As there was enough material at our disposal (mainly on Internet) to grasp a significant overview of the program, the case was included in the thesis. However, we must keep in mind several biases that could affect the findings. First, the information we have at our disposal is official communications, and thus is displayed and communicated on very formal terms. We were not able to implement triangulation with more informal information. Furthermore, some details could not be found: for instance, we could not analyze who were the internal stakeholders involved in the program or how the implementation of the program modified the relationship the company had with farmers. Since we do not have an insider point of view, we could not provide any information concerning informal mechanisms. Consequently, we could not elaborate a critical point of view on Mulino Bianco’s sustainable sourcing program. Nonetheless, the case study still gives some relevant inputs to the issue, the main source of information to analyze being the adopted sustainable agriculture framework. Therefore, we strived to analyze the different steps of the program implementation keeping in mind the scientific pitfalls listed above.

¹⁹ Information on the launch of Carta del Mulino can be found on Barilla’s website (<https://www.barillagroup.com/it/comunicati-stampa/mulino-bianco-presenta-la-carta-del-mulino>)

Mulino Bianco's wheat sourcing

As stated in the previous chapter, Mulino Bianco purchases 44% of its soft wheat in Italy and the rest in different European countries. All the wheat is then transformed in wheat flour by Italian millers. We were not able to get more precise details, but it is relevant to note that although the company is based in Italy, and thus evolves in a whole different context, we still encounter the same sourcing pattern (farmers > cooperative or stock organism > millers > factory > consumer). Therefore, we can expect that Mulino Bianco faces the same difficulties in terms of collecting the data and enforcing transparency throughout its supply chain.

It is also stated on Mulino Bianco's website that the company purchases 240 000 tons of wheat per year.

Involved stakeholders

According to website's information, Carta del Mulino program received the support of different external stakeholders:

- **WWF** is a project partner and contributed to the definition of Carta del Mulino's rules.
- **Open Fields** is the technical partner of the project which contributed to the definition of Carta Mulino's rules and developed a software which allow the different actors of the wheat chain to communicate between them.
- For the implementation of Carta del Mulino, Mulino Bianco also collaborated with two different universities: **the science and agri-food technology Department of Università di Bologna, and the Department of Innovation in biology, forestry and food of Università degli Studi della Tuscia**, which validated the positive impacts of Carta del Mulino in terms of sustainability and biodiversity and monitored the benefits for the whole chain.

Concerning the internal stakeholders, we assumed that as Giuseppe Mora (Purchasing senior manager at Barilla) was several times interviewed to talk about the program, he is one of the main actors of the implementation of sustainable sourcing within Mulino Bianco.

Sustainability standards

La Carta del Mulino, which can be found in axe of this thesis, is organized around 10 rules, and each one of them has related indicators. The rules can be grouped around 4 major themes:

- **The traceability and sustainability of the whole supply chain:** all farmers must be compliant with La Carta del Mulino's standards, and all stocking organisms and millers must be certified ISCC Plus. In order to get a better understanding of what the implications for the stocking organisms and millers are, a deeper research of what ISCC plus is was conducted: ISCC plus is a voluntary certification for food, feed, bio-based products and

energy. ISCC fulfils the requirements of the Sustainable Agriculture Initiative (SAI) and ensure the sustainability of the whole value chain. Therefore, demanding for the millers and stock organisms to be ISCC Plus certified is a way for Mulino Bianco to make sure the whole chain respects sustainability criteria.

- **The choice of production plots and the crop planting:** choice of the wheat variety, prohibition of the use of GMOs, crop rotation and intermediate crop to preserve soils, protection of local biodiversity (3% of the UAA is reserved for the introduction of flowers to foster the presence of pollinators insects)
- **Culture nutrition and health:** limitation and strict monitoring and control over the use of inputs, prohibition of nicotinoids, prohibition of glyphosate from the sowing to the harvesting of the wheat (it is relevant to mention that glyphosate is already prohibited in the pre-harvesting phase in Italy but it is not the case of all European countries).
- **Stock and transportation:** Carta del Mulino wheat must be separated from conventional wheat at all stages and it should be closely monitored; stock must be closely monitored in order to prevent the use of chemical products.

From this charter, we conclude that biodiversity (from preserving of soil structure and fertility, to favoring the life of pollinators insects, promoting different varieties of wheat crops) is at the center of Mulino Bianco's approach. Those rules are to be applied not only to wheat cultivated in Italy but also in the other European countries.

Criteria improvement

The rules and criteria of La Carta del Mulino will be updated on an annual basis in accordance with the WWF, in a logic of continuous improvement. For instance, the company committed to exclude the use of glyphosate also during the pre-sowing period (which is not the case now as the charter has been defined) from 2020, which would anticipate the change of the European regulation concerning the authorization of glyphosate use.

Relationship with farmers

Just like LU, Mulino Bianco compensate the wheat farmers with a bonus meant to cover the needed costs and investments that would otherwise considerably impact their revenue (for example, since 3% of the UAA must be reserved for flower plantations, the farmers' revenues would decrease). It is not mentioned however the amount of the bonus and if it would be enough to cover all the revenue variations resulting from the change in farming methods and the constraints of the charter.

Controls and audits

Both the standards of Carta del Mulino and ISCC Plus requirements are controlled by a third-party entity, RINA, which was trained on the specific requirements of Mulino Bianco and its new private standard.

The above findings from the four study cases can be summarized in the following table:

	LU Harmony	Blédina	Jacquet Brossard	Mulino Bianco
Wheat sourcing	France	France and others (Spain)	France (Limagne)	Italy and other European countries
Birth of the program	Internal preoccupations	Group driven + internal preoccupations	Weak internal preoccupation	No information
Involved stakeholders	-NGOs and technical institutes -Purchasing dpt. -Quality dpt. -Sustainable agriculture manager	-NGOs and technical institutes -Purchasing dpt -Quality dpt -Sustainable agriculture manager	-No external partner -Purchasing dpt -CSR manager	-NGO, technical institutes and universities -No information on internal departments involved
Sustainability standards	Private standard based on integrated agriculture, with a strong focus on biodiversity	Criteria based on regenerative agriculture approach	No formalized standards or criteria concerning sustainable agriculture. Existence of a charter of good practices but no control or obligation for farmers to implement it.	Private standard based on integrated agriculture, with a strong focus on biodiversity.
Revision of the criteria	-Standards revised every year in a logic of continuous improvement -Importance of experimentation (existence of pilot farms)	-No formalization of the standards evolution	-No formalization of the standards evolution -Importance of experimentation (existence of pilot farms)	-Standards revised every year in a logic of continuous improvement
Financial incentives	Bonus for the implementation of sustainability standards	No formalized bonus, financial incentives for the implementation of some measures	No financial incentives for the implementation of sustainable agriculture methods	Bonus for the implementation of sustainability standards
Control and audits	Audits realized by a third part entity	Audits realized by a third part entity	No formalized audits	Audits realized by a third part entity

4.4. Theoretical discussion

Intra case comparison allowed us to get precise and detailed inputs on each company's sustainable sourcing programs. From this analysis, we can now compare the cases between them to extract relevant data and be able to confirm or reject our hypothesis and thus attempt to provide an answer to our research question. Therefore, the aim of this chapter is (1) to confront the findings between them thanks to a cross-case study and (2) to confront the findings with the theoretical hypothesis stated in the previous chapter.

4.4.1 Cross-comparison of company's characteristics

Comparing the company's background is the first essential step in our case study. As a matter of fact, it sets up the context in which companies are evolving and allow us to compare the cases keeping in mind the main differences of context.

We can state that the four cases present companies with significant similarities: similarities in the activities conducted, in the organizational model and in the wheat sourcing model. Nonetheless, some key divergent elements that impact significantly the way the different companies implement their sustainable policies concerning wheat have emerged throughout our analysis.

Activities conducted and companies' dimensions

First, the four companies produce biscuits and/or soft cakes and therefore all have similar production models. However, we can note that the biscuits products occupy a different position within the company's product offer. While for Mulino Bianco, Jacquet Brossard and LU, biscuits and/or soft cakes are the flagship products of the brands, Blédina is positioned mainly on baby food and therefore biscuits are only one product among the whole product line. Consequently, wheat is the main raw material needed for the three companies listed above, while for Blédina wheat is only one of the sourced raw materials and, as stated by Juliette Rembert, it is not the most visible for the consumer. Indeed, she stated that "*consumers might pay more attention to the provenience of the milk in dairy products, or the composition of the vegetables baby jars, but they rarely pay attention to wheat characteristics, as it has been through several transformation processes and is only present in a small proportion in our products*". Furthermore, wheat is not the most at-risk resource: for example, fruits and vegetables face more safety and environmental issues than wheat. All of this information can explain why there is not a special program dedicated to wheat sourcing within Blédina. Blédina's approach in terms of sustainable agriculture is a general one, that can apply to all the sourced materials, whereas Harmony charter and La Carta del Mulino specifically apply to wheat cultivation, stock, and transport and therefore tackles issues which are specific to this particular raw material (for instance, both charters give precise

indications on the amount of phytosanitary treatments and nitrogen inputs that should be used for wheat culture, whereas Blédina only provides general guidelines).

In terms of economic importance, the four companies have different sizes: LU is bigger than the others in terms of employees (if we compare it to Mulino Bianco and not Barilla). Both LU and Mulino Bianco have an important part of the market shares and are the flagship brands in terms of biscuits. We can state that it has a significant importance when it comes to the implementation of a sustainable sourcing program: as Mulino Bianco is well-known in Italy and not only, the company has more visibility and thus might be more easily under consumer's pressure. For instance, Barilla has gone through a harsh criticism when consumers understood that its wheat was not sourced in Italy, which triggered Barilla to take position.

Organizational level

Regarding the organizational level, is also relevant to note that all four companies under study belong to bigger groups. However, if LU, Blédina and Mulino Bianco belong to multinational groups (namely Mondelez, Danone and Barilla), Jacquet Brossard belongs to a very particular group (Limagrain's organizational characteristics have been underlined before) which only has a small proportion of its revenues earned abroad. In all cases, the role of the group has been highlighted. It is for Blédina that it played the most prominent role, as Danone took in charge to define and disseminate the term of regenerative agriculture, which is a strong stance in terms of sustainable agriculture as we underlined in the previous chapter. Danone's support has acted as a strong driver in the implementation of sustainable agriculture measure as the term of regenerative agriculture is completely unknown from the consumers. Nonetheless, a group's commitments can also act as an impediment, as it is the case with Jacquet Brossard. Marie Condy, in charge of CSR within Jacquet Brossard, explained that due to Limagrain's particular model in which farmers are at the center of the activity, Jacquet Brossard could not implement a sustainable sourcing program as it would require to "*challenger the farmers' traditional farming practices*". In this case, the role of the parent company could therefore be considered as negative, as it did not incentive Jacquet Brossard to develop a sustainable agriculture program. These observations echo EY's conclusions in their report "*Building resilient and sustainable supply chains*" (2011): the influence of corporate management was significantly underlined. Corporate management, due to hierarchical power, oversees the sustainability strategy and therefore has the power to take strong sustainability commitments.

Furthermore, the question of sustainability occupies a different position within each of the companies. As a matter of fact, our analysis underlined that sustainability were core values of LU

and Blédina. Exploring Danone's positions on its website, it was striking that there was a particular emphasis on approaching sustainability questions with a scientific point of view. As a matter of fact, both primary and secondary information on the company underlined a real awareness of climate change phenomenon, a strong will to take action, and all this was supported by scientific facts and figures. On the other hand, there is few information on sustainability-related issues on Jacquet Brossard's website, which denotes a weaker maturity of the company on those subjects.

Another relevant point to note is the informant's organizational position for each of the company understudy. As underlined before, we could not get any internal informant within Mulino Bianco. With regard to the other companies, Elodie Parre and Flora Schmitlin were "*In charge of agriculture and biodiversity issues*" and were referring first to the communication department and then to the marketing department. Juliette Rembert for Blédina is "*Sustainable agriculture technical manager*". Finally, Marie Condy is "*responsible for CSR*" and reports directly to the CSR manager within Jacquet Brossard. At this point, we can already point out significant differences that shed light on the importance of sustainable agriculture issues within each company. Having someone in charge of sustainable agriculture full-time denotes a strong will to give value to those subjects; whereas relying on the CSR manager to tackle the question might denote the less prominent character of the subject.

Furthermore, going through the different cases we realized the importance of having dual competencies when you are in charge of sustainable agriculture program. As a matter of fact, being able to master both agronomical skills and managerial and organizational skills allow the person in charge to act as a point of reference both for the suppliers and the consumers. This was underlined different times, mainly by Elodie Parre. On the other hand, Jacquet Brossard's case presented someone who is in charge of many different projects all related to CSR, tackling different aspects of the agri-food company (the main emphasis is on food waste, but some projects tackling emission reductions, workplace wellness or ecodesign have also been mentioned). Therefore, the main competencies required are project management skills, and less importance is given to scientific background.

Finally, the differences in the sources of information also shed light on the way sustainable sourcing programs are implemented within the companies. For instance, LU provides a lot of secondary information on Harmony program, which underlines the importance given to the program. It is also the case of Mulino Bianco, whose website provides a lot of details on where the wheat is sourced. On the other hand, Jacquet Brossard provides little or no information on its wheat sourcing on its website, which underlines that it is far from being a priority for the group.

As underlined before, we only have secondary information for Barilla, but the fact that we have enough information to be able to build our analysis on the communicated secondary information shows that it is a flagship program for the group and that considerable attention is being paid to the environmental impact of wheat sourcing. Finally, Blédina provides also much information on sustainable sourcing on its website, but not much on wheat sourcing particularly since it is not a priority for the group.

Sourcing models

Concerning the different companies' wheat sourcing model, our field study showed substantial similarities with the model exposed in the third chapter. All the companies follow the model farmers > farming cooperative > millers> biscuits/cakes factory, as wheat needs to be transformed in flour for the biscuits to be produced. Therefore, in all the companies, the problem of transparency and data collection is present. The biscuit producing companies have little visibility on the raw material since they only purchase it in the form of flour. For the chain to be fully transparent, the companies need to trace it back and map the wheat chain entirely, including the wheat farmers. The four companies under study agree on the fact that more visibility on their suppliers' activities is essential for them to be able to fully control their environmental impact. It is particularly relevant to note that even within Jacquet Brossard, which we approached thinking that its organizational model would provide significant differences in the wheat sourcing model, in particular concerning transparency since the company is based on a cooperative model so the farmers belong to the company; there is little visibility on the raw material chain. According to Marie Condy's testimonial, Limagrain's farmers and Jacquet Brossard act as two completely different companies and Jacquet Brossard has little control on the wheat provenience. However, we can think that if sustainable sourcing were to become a priority for Jacquet Brossard and Limagrain, the group would really hold the key to transform its chain very rapidly thanks to its actual organizational model.

It seems also relevant to note that for all companies' under study, sourcing their wheat locally seems to be a priority; and therefore, they all put a strong emphasis on this issue. Concerning the three French companies under study, they all source their wheat in France - the only exception being Blédina, which, as detailed in the previous chapter, faces stricter regulation on baby food and therefore must source part of its wheat in Spain. Mulino Bianco, on the other hand, evolves in a different context (the Italian context) and therefore has a different access to soft wheat production. While soft wheat is largely cultivated in France, it is less cultivated in Italy and therefore Mulino Bianco is forced to source soft wheat from other European countries. We can assume that it complexifies the supply chain in terms of transparency, but also in terms of

regulations. As a matter of fact, environmental regulations are not harmonized around Europe (for example, around glyphosate’s use), and consequently, la Carta del Mulino must implement sustainability standards which can be applied in many different contexts.

Finally, all companies underlined the same difficulties when trying to source organic wheat locally: all respondents talked about their difficulties to source local organic wheat and mentioned different reasons (not enough organic wheat grown in France, high prices of organic wheat, lengthy time of conversion). We can therefore draw the conclusion that the lack of organic wheat is one of the reasons that has led the companies to build their own sustainability criteria and to implement them with their own suppliers, whom they have been working for years.

To conclude this part, we can state that the four companies understudy present different backgrounds, organizational models and products offer but they all face the same issue, which is to source soft wheat in a sustainable way. In several cases, companies made a tentative to rely on organic wheat, but they encountered obstacles. All of the four companies, however, decided to implement measures aiming to source a more sustainable wheat; although they all stand at different stages of the process. The next chapter will be dedicated to confronting the different cases to the theoretical hypothesis.

4.4.2. Confrontation with hypothesis

The first research hypothesis was the following:

(H1) A cross functional approach is needed for the definition of sustainable sourcing criteria: procurement or supply chain functions are the ownership of the program, but they are supported by a good internal network. A formal governance process supports the implementation of the sustainable sourcing program.

With reference to the literature review, three types of stakeholders have been identified in the four cases understudy (Chen and Paulraj, 2004):



Figure 15 - Sustainable sourcing stakeholders (Source: Chen and Paulraj, 2004)

If we put under examination the different categories one by one, we can extract some relevant findings:

(1) **Company internal stakeholders:** within this category of stakeholders, the importance of the purchasing department and the quality department was underlined repeatedly, as they are the two departments which are most in contact with the suppliers. It is relevant to underline the significant transformation of the role of the purchasing department within the process of the implementation of a sustainable sourcing program. This transformation is very explicit in the case of LU, where a new job was created within the purchasing department to take over this transformation. In the case of Mulino Bianco, the purchasing director also seems to be in charge of Carta del Mulino's program, although his precise role should be further understood. The role of the purchasing department within Jacquet Brossard seems to be one of the main obstacles to the implementation of a sustainable sourcing program, as it is simply in charge of purchasing the raw materials at the right price and the right volume. As underlined by Chen and Paulraj (2004), "*corporate management only has a strong positive effect on the purchasing function to implement sustainable sourcing if there is a corporate sustainability strategy or a sustainability-oriented corporate culture*". Finally, the role of the purchasing department within Blédina is more unclear, but the informant still underlined her frequent collaboration with the department in question. However, Marie Condy underlined during the interview that the purchasing department director was highly sensitive to environmental issues. We can therefore conclude that environmental awareness is not enough for proper sustainable sourcing programs to be implemented, but strict criteria must be formally implemented in the purchasing processes, support from corporate management is essential.

As a matter of fact, as illustrated in the previous part, corporate management can act as a strong driver in the implementation of a sustainable sourcing program (as it is the case or Blédina) but also as a brake (as it is the case for Jacquet Brossard). In LU case, corporate management role is more unclear as Mondelez is now financing the initiative, but the Harmony program was initially born from the will and the vision of LU and embodies the brand's values.

In all the cases under study, another essential internal stakeholder is the sustainable agriculture manager (or equivalent in function of the formal title given to the function). His role is critical, as the person in charge acts as a point of reference for the suppliers, the consumers, and all internal functions on the related matters. Just like the transformation of the purchasing function, it often derives from the creation of a new job, and thus demonstrate the need of organizational transformation to tackle environmental issues.

Finally, the role of marketing and sales, which was underlined by Chen and Paulraj (2004) was not mentioned during the various interviews as we chose to focus first and foremost on the relationship with the suppliers, although several respondents highlighted the importance of the issue of consumer communication when it comes to the implementation of private standards.

To conclude on internal stakeholders, our analysis underlined (1) the significant role of the sustainable agriculture manager (2) a profound transformation of the role of the purchasing department and (3) the necessary support of corporate management.

(2) **Supply chain internal stakeholders:** Chen and Paulraj (2001) included in this category both consumers and suppliers. None of the respondents identified consumers as a lever of action. On the contrary, it seems that in all companies under study the program was born from an internal awareness. Likewise, suppliers were not a lever of action, but they were nonetheless included in the process of sustainability standards definition. As a matter of fact, Elodie Parre from LU explained that farmers, cooperatives and millers were involved from the beginning of the program in the process. Regarding the other companies under study, the suppliers' implication in the standards definition is less formal but they still are considered as primary stakeholders.

(3) **Supply chain external stakeholders:** in all cases apart from Jacquet Brossard, external stakeholders were identified during the interviews and respondents underlined their significant role. An in-depth analysis of the role of those external stakeholders will be analyzed in the next part.

All the respondents stated that sensitization and education of both consumers and internal collaborators was critical to the success of the process. The example of LU is particularly striking. As the internal team chose to focus on biodiversity, which was not a very common theme back in 2008, an important operation of education had to be conducted around this theme.

Furthermore, if we refer to the different models identified by EY (2011), namely siloed model, integrated model and hybrid model, we can state that all companies under study have implemented a hybrid model. As a matter of fact, sustainability function collaborates with procurement to provide inputs: all respondents underlined the regular steering committee involving members of the purchasing department, quality department, and other internal stakeholders relevant to the project.

Regarding the different governance processes identified by Wang and Ran (2018):

- (1) **Communication and trust mechanisms:** Wang and Ran included in this pillar both formal and informal communication. Regarding formal communication mechanisms, all companies, even the less mature ones in terms of sustainability, highlighted the existence of regularly scheduled cross-functional team meetings around CSR issues, whether sustainable agriculture was a key focus or not. However, it was difficult from the conducted interviews to understand the role of informal communication: none of the informants mentioned its existence. Furthermore, the existence of several intermediaries (cooperatives and millers) between the companies' stakeholders and the suppliers acts for sure as a brake to informal communication.
- (2) **Collaborative R&D mechanisms:** we found a significant correspondence between Wang and Ran's reflection on this point and the different interviews and information we had access to. As a matter of fact, LU and Blédina mentioned the existence of pilot farms where farmers and the company were working together on the future's charter improvement. Marie Condy also mentioned that within Jacquet Brossard, although no sustainable agriculture program was formally implemented, some farmers were working together on good agricultural practices and there was a transfer of information on this subject. As Wang and Ran talk about a "win-win" strategy (*"Collaborative R&D and innovation reflects the characteristics of win-win cooperation in SCM which contributes to maximizing their mutual interests that benefit the whole supply chain"*), Elodie Parre mentioned about a "win-win-win" strategy, including the company, the farmers and the consumers in the process.
- (3) **Restructure mechanisms:** although we identified different transformations processes throughout the analysis, we cannot really talk about strategic systemic restructuring mechanisms. There have been significant changes on the way of working of the purchasing department, as they don't only work with millers or cooperatives but with the whole supply chain; and new functions (such as the sustainable agriculture manager) have emerged. However, the wheat supply chain has not changed form; consequently, we are only assisting to superficial organizational changes.

Finally, our analysis of scientific literature underlined the importance of an information sharing platform (Wang and Ran, 2018). We find a striking example of this mechanism in Mulino Bianco's case: Openfields, one of the external stakeholders Mulino Bianco is working with, contributed to the development of a software which permits to trace wheat throughout the whole supply chain and allows the different actors to communicate. Although the importance of knowledge dissemination has been identified by the other respondents (Blédina and LU mentioned learning

days, ...), no other company implemented an information sharing platform as formally as Mulino Bianco did.

To conclude on this part, our cross-cases analysis allowed us to qualify and detail our first research hypothesis. For a sustainable sourcing program to be successful, a cross-functional approach including the sustainable agriculture manager, the purchasing department and the quality department is needed. The role of those different departments profoundly changed and now includes developing knowledge and skills on dealing with the sourcing sustainability criteria. The sustainability commitments have to be supported by the corporate management. The relationships between the different departments must be supported by a strong governance process.

(H2) The support of an external partner, such as an NGO, is a crucial choice for a company: it legitimizes the process and allows the company to gain expertise concerning its supply chain.

As stated above, supply chain external partners have been identified in three of the four cases under study:

- Regarding LU : Noé conservation, Agrosolutions, Réseau Biodiversité Abeille
- Regarding Blédina: Pour une Agriculture du Vivant (PUADV) and WWF.
- Regarding Mulino Bianco: WWF, Open Fields, Università di Bologna and Università degli studi della Toscana.

It is interesting to note that WWF has been chosen by two different companies (and all the more by companies based in two different countries) to act as a guarantee to the consumers. As a matter of fact, it is a well-known NGO operating all around the world which benefits from a very positive image from the consumer's side.

However, this partnership is always coupled with another partnership with a technical institute, which has less visibility than WWF can have. In the cases under study, the technical institutes were small-sized associations or NGOs working on very specialized subjects and accompanying the company on precise aspects of their program. The importance of those technical institutes, which provide support in the definition of sustainability standards and criteria and support the company throughout the development of their processes, had not been underlined in the literature review. We can therefore draw the conclusion that the partnership with WWF a "branding" function whereas the partnership with a technical institute aims to providing some technical knowledge. If we refer to the literature review exposed in the first chapters, we can assert that the partnership

with WWF has a co-branding function (Poret, 2014): it can give a positive image to the consumer. On the other hand, the coupled partnership with a technical institute is necessary to develop a code of conduct and monitor it. All mechanisms identified by De Boer (the establishment of private standards, the creation of evaluation mechanisms with independent certification and the recognition of the control party by an accreditation) can be found in the different sourcing programs under study.

Regarding Jacquet Brossard's case, we did not identify any external partner supporting the company on sustainable agriculture's issues, although the respondent underlined her will to develop this kind of partnership in the future. From this observation we can state that the more the company is serious on its sustainability commitments, the more it will have to be challenged by external stakeholders.

Finally, it is extremely important for the partnership with the external stakeholders (NGOs and technical institutes) to remain active. The external stakeholders must be considered as constant challengers of the company's activities and be able to keep a critical eye on its operations throughout the process.

Therefore, the partnership with the NGOs and the technical institutes has different roles: (1) provide technical knowledge that cannot be found internally in the company, (2) legitimize the company's process in the eyes of the consumers, and (3) continually challenge the company in an approach of continuous improvement.

Finally, we did not explore the reasons that led a company to choose one NGO or technical institute instead of another. This could be an issue of future research, as could be the governance within this kind of partnership. It would allow us to gather deeper knowledge on how those partnerships work out and thus understand if those partnerships are used exclusively to give legitimacy to the company in the consumers' eyes, or if the external stakeholders truly challenge the companies on their environmental policies.

(H3) To source sustainable products, companies must define strong criteria of sustainable agriculture, based on scientific facts, defined in collaboration with external stakeholders and controlled by a third party.

It must be kept in mind at this point that we did not have the chance to analyze the comprehensive standards framework but only the formally communicated summarizes that can be found on the Internet. For confidentiality issues, we did not have access to Blédina and Jacquet Brossard's frameworks.

Concerning the form of the standards and with regard to the information found throughout the different intra cases analysis, we can state several assumptions regarding the typologies of standards:

- (1) For the three companies which already formally implemented a sustainable wheat sourcing program, we are dealing with individual firm standards. It is more evident within LU and Mulino Bianco since it refers to a proper standard, with listed criteria applying to a specific raw material, whereas in the case of Blédina we are dealing with guidelines on regenerative agriculture principles, applying to all the sources materials. It is most likely that some detailed criteria specific to each raw material exist and are shared internally but we did not have access to it.
- (2) All of them are business-to-consumer standards. LU developed a logo which is displayed on Harmony certified products, and Mulino Bianco also communicated on its first product line which is using Carta del Mulino's wheat flour (Buongrano biscuits). Blédina also communicates thanks to its packaging on its sustainability commitments, although the company did not develop a proper logo since its commitments do not take the form of a specific program or standards.
- (3) The standards are a mix between process standards and product standards. As a matter of fact, we found across the studied cases specifications on the product but also on the way it has to be stocked or transported.
- (4) All standards resort to third party certification in all the cases. One of LU's respondent underlined that this is what makes the standard credible.

A stringent point that emerges from the study is that criteria are meant to evolve. Be it LU, Mulino Bianco or Blédina, there is a logic of continuous improvement and the criteria are reevaluated on a regular basis - since Jacquet Brossard did not implement formal criteria, there is no formal reevaluation of the criteria.

Finally, the importance of experimentation has also be underlined different times: two respondents mentioned the existence of pilot farms who have the role of exploring some farming methods that could be then included in the approach of continuous improvements of sustainability standards. Therefore, we can underline the fact that the role of the company goes way beyond selling products: throughout our cases study we had a striking example of how companies could act as a strong actor in research gathering all the involved actors around experimentation of new farming methods.

Concerning the actual content of the different standards, we can argue that all three companies (Jacquet Brossard excluded) adopted a certain vision of sustainable agriculture, choosing a certain

stance on the subject of sustainable agriculture, each of these stances supported by scientific arguments. Blédina, with Danone's support, chose to approach sustainable agriculture by defining regenerative agriculture criteria, while LU and Mulino Bianco chose to define integrated agriculture's standards.

Furthermore, we can argue that all respondents justified why they chose to implement their own private standards instead of organic standards. Within the reasons cited, we could identify logistic reasons (among others: difficulties to source organic wheat locally, high price of organic wheat) but also ideological reasons (Juliette Rembert, from Blédina, stated that she was convinced organic was not the only solution to answer agriculture's transition towards sustainability, illustrating her point with scientific facts and figures). Private individual standards also offer some flexibility to the company compared to public or international standards. However, it is necessary to underline that this flexibility can cut both ways: on one side, it can be the opportunity for the company to develop a tailor made standard which is adapted to the suppliers needs and constraints; on the other way a too specific standard could lose credibility among consumers. As explained in the next part, it would therefore be particularly interesting to study the perception of consumers of private standards in a later research.

Nonetheless, it is necessary to note that all the companies under study launched an organic line of products. Further studies should be led to be able to understand if this choice was made out of business arguments or out of ideological arguments.

Hatchuel et al. arguments, exposed in the previous chapter, bring a new light to this information: Hatchuel et al. talked about a "sector approach" or "sector agreements" regarding the development of private standards. They assert that the development of those private standards is generally more strict than official regulatory systems, and therefore induce profound changes in the sector (in our case, within the wheat cultivation and production chain). Although most of the cases under study are recent initiatives and thus prevent to have a long-term vision, we can still assert that implementing integrated agriculture criteria (or regenerative agriculture criteria), the programs we focus on contribute to the improvement of our current farming system towards more sustainability.

To conclude on this research hypothesis, three out of the four companies under study implemented strong sustainability criteria, although Blédina's criteria do not take the formal shape of a charter (contrarily to LU and Mulino Bianco). Those sustainability criteria are based on different approaches and definitions of what sustainable agriculture is: concerning LU and Mulino Bianco, the charters defined by the companies are based on integrated agriculture principles and criteria, whereas Blédina's criteria are based on regenerative agriculture criteria. Concretely,

those two different approaches translate into different farming methods. In all cases, those standards were built as an alternative to organic standards: be it for business reasons or logistic reasons, sourcing organic wheat was not deemed as a strategic choice. Those standards were all built in partnership with external partners (NGOs and/or technical institutes), whose role is to constantly challenge the companies on their sustainability issues to urge them to go further. Therefore, the implementation of such criteria in agri-food companies contribute to a profound change of a whole chain, and go in the direction of a more sustainable agriculture.

(H4) Those standards must be supported by a strong sensitivity and recognition of context. Communication and trust in the relationship with the suppliers are essential for farmers to onboard the program and measures of support must be implemented during the transition period.

EY stated in its 2011 report that *“leading companies in terms of sustainable sourcing are establishing a shared commitment with suppliers”*. When focusing on creating shared value, companies are likely to achieve a mutually beneficial relationship that takes advantage of higher quality. Finally, EY underlined that leading companies are not looking to “police” suppliers and terminate those that underperform but look to co-create value with their suppliers.

During our different analysis, this approach of case by case resolution was very present. As a matter of fact, since we are talking about private voluntary standards implemented by only one company, and not public regulation that should be applied to all the farmers, it is impossible for the company to adopt a policing approach as it would most likely lead to the farmers terminating their contract if they are not satisfied with the criteria, which would endanger the company’s position. Comparing private standards with public standards such as organic regulation, we find in private standards the advantage of being flexible and open to case-to-case discussion. It also enables the company to adapt the framework to the suppliers’ difficulties and needs and to co-construct a standard adapted to the company, having an open discussion with the different stakeholders.

LU was the only case where the standards’ controls were stricter. As stated in the previous chapter, Elodie Parre testified that some wheat had to be declassified in “conventional wheat” when it was not respecting the Harmony criteria, and consequently the farmer did not get the associated bonus. We can draw the conclusion that the more the program is mature, the more the controls have to be strict. As a matter of fact, when a company just launched recently its program, the priority is to convince the suppliers to onboard the program and therefore companies display

more flexibility. Furthermore, when a program such as Harmony becomes bigger and therefore includes more and more suppliers, the problems cannot be dealt on a case-by-case basis as it would take too much time. Consequently, when a program extends, it has to be supported by a strong control system; and it is the challenge that LU is currently facing.

It was underlined through our analysis of the scientific literature that it was essential to provide learning and support to the different actors of the wheat chain (farmers, cooperatives and millers). Our different interviews pointed out that the farmers' reaction to the implementation of those sustainable sourcing programs were very different. As a matter of fact, Juliette Rembert mentioned that the farmers had already been implementing some of the proposed sustainable farming methods for quite some time and therefore were quite responsive to the regenerative agriculture approach. On the other hand, Elodie Parre and Flora Schmitlin mentioned that some suppliers had expressed some "distrust" facing Harmony's program. It seems relevant to remind at this point that almost 8 years separated the implementation of both programs and that consequently the farmer's approach might have evolved in this time-lapse.

In any case, support and learning remain essential to the good implementation of a sustainable sourcing program and was identified as such by all our respondents. Within Blédina and Lu, it takes the form of learning days, which gather all the supply chain stakeholders, and is organized at least once a year. It is also mentioned in Harmony's charter that the chief operating officer of the farm plays a significant role, as he has to act as a vector of information within the farm (Criteria number 33 of the charter, see the Harmony charter in annex).

Experimentation is also key in the new relationships with the farmers that were described throughout the different cases. Both LU and Blédina mentioned the existence of pilot farms where they were testing new farming methods that could then be included in the sustainability standards of the companies. Not only the companies play a role of significant research actors as underlined in the previous part thanks to those pilot farms, but involving the farmers in this research process also give them a new role.

The role of the financial compensation was not explored in our scientific literature analysis, but three companies out of four actually use it as a collaboration mechanism. Thus, companies acknowledge that sustainable farming measures can have an impact on farmers' revenue. Within LU and Mulino Bianco, it takes the form of a financial bonus for each of the measure that the wheat production is compliant with, whereas it takes a less formal form within Blédina. As a matter of fact, Blédina provides a financial compensation for some infrastructure projects that the farms might have to implement. However, it was formally underlined by both LU's informants that a

financial compensation is not enough for the farmers to stay in the process (Elodie Parre stated that “*it was enough to make them join but not enough to make them stay*”).

Finally, Hatchuel et al.’s arguments are once again relevant here: their analysis of private standards stated that they contributed to create a new relationship between the companies and the farmers and to give them more visibility. As a matter of fact, we observed a significant shift in the relationship between the farmers and the companies in the cases under study: while purchasing departments used to be in contact only with millers, the implementation of a sustainable sourcing program required the companies to work with the whole supply chain. Consequently, it involves mapping all the suppliers and getting more transparency and knowledge on the sourced raw material.

To conclude on this part, our field study confirmed the scientific literature’s findings: recognition context is essential to the success of the implementation of sustainable sourcing program. Relationship between the sourcing company and the suppliers deeply changed: the implementation of a sustainable sourcing program fostered the communication between the different actors (whereas the communication was before limited to a company/millers relationship). The suppliers are involved in the definition of the sustainability standards and their work is more and more recognized and acknowledged. Relationship with the different supply chain stakeholders are characterized by a strong communication, trust and knowledge dissemination. The field study also highlighted that a financial compensation is a strong incentive for the farmers to onboard the program but that it is not enough. The term of co-creation is essential: as a matter of fact, both LU informants highlighted that the most salient feedback from the farmers are that they are proud to see that they are adding value to the product through their work.

4.4.3. Future research

Although this field study gave us numerous inputs on how a company could implement sustainable sourcing through the creation of private standards, several points could be further explored.

First and foremost, it would be needed to cross this analysis with an agronomist’s look. As a matter of fact, it would enable us to analyze the different companies under study criteria and their definition of sustainability with a critical eye. Research focused on the managerial and organizational aspect of the question because it is the author’s field of competencies, but for the study to be relevant a purely scientific approach would be necessary as it would allow a better

understanding of the sustainability criteria. The necessity to link the scientific aspect and the organizational and managerial aspect in order to translate the definition of sustainability into organizational commitments was cited several times throughout this thesis, but it could actually be done only if crossed with a scientific point of view, which this analysis is lacking. This would be the first step if this research was to be further developed.

Globally, private standards and their implementation in agri-food companies is an issue that has only been scarcely treated. The only scientific articles dealing with this subject establish lists of private standards and define different typologies. The question of how private standards can be an instrument in supply chain sustainability has been tackled only by few authors. Several interesting points have been quickly considered but would deserve to be treated in-depth.

First, our analysis focused on the first steps of a sustainable sourcing program: who should be involved, what instruments companies have at their disposal to transform their supply chain, and how they can control that sustainable sourcing is well-implemented. However, another interesting problematic would be relevant to study. As a matter of fact, LU's informants mentioned the difficulties the company was facing at the moment, which are extending the program to a significant number of suppliers based in different countries with different regulations and measuring the actual impacts of the program (whether the program actually has a positive impact on environment or not, and if yes how it can be quantified). Consequently, it would be interesting to focus on the next steps of the program. We chose to focus for this analysis on the birth and the first developments of sustainable sourcing programs since it is quite a recent and innovative phenomenon within agri-food companies; however, since more and more companies are starting to include sustainability criteria into their purchasing policies, it could be interesting to focus on the future developments of those programs. Thus, it would be relevant for companies who already implemented their sustainable sourcing program, whereas the managerial recommendations this thesis could provide target the companies who are less mature on the subject and who might be looking to source their raw materials more responsibly.

The second aspect that could be further analyzed is the receptiveness of consumers to private standards regarding food products, similar to the one which were studied in this thesis. As a matter of fact, we chose for the redaction of this thesis to focus on the role of companies and to set aside the consumers' role and the act of purchasing. Yet, it would be particularly relevant to explore the receptiveness of consumers towards private standards, in a context of multiplication of logos and certification on consumption products.

5. Conclusions

The field study, based on four relevant cases, allowed us to precise and qualify the hypothesis extracted from the analysis of the scientific literature, and to apply those hypotheses to concrete corporate situations. From this analysis, we can extract several points.

First of all, the implementation of private standards suggests a voluntary willingness to act in favor of sustainability. Most of the times, the reasons evoked to explain the birth of the sustainable sourcing programs were internal concerns, and not consumer pressure. To answer those internal concerns, companies use the instrument of private standards: they define their own standards which reflects both the needs of the company and of the suppliers, and which offer some flexibility compared to national or international standards. Sourcing raw materials that respect certain defined standards, companies give considerable impetus towards a sector change. Throughout the process of defining charter standards, they make some choice in terms of sustainable agriculture. By choosing one or another approach, they make a stand; and this reflects a commitment, a pledge from the company. Once again, the aim of this thesis was not to understand which farming approach reduces the most the environmental impacts of wheat culture since it is part of a heated debate within the scientific community, but to understand how companies could implement sustainable sourcing at an organizational level, focusing on the tool of private standard.

Studying the implementation of those private standards, we extracted some relevant learning and identify success factors regarding the implementation of sustainable sourcing criteria. First of all, a cross-functional approach is necessary: different internal departments (mainly quality and purchasing) must be involved. The company's commitments in terms of sustainability must therefore be accompanied by a shift in the role of those departments. In particular, purchasing function should not be limited anymore to source the right material to the right price but the department must develop a strong knowledge on the products sourced and their environmental impact. This shift is absolutely critical for sustainable sourcing to be successfully implemented. Furthermore, these sustainability commitments must be strongly supported by corporate management, which, due to its hierarchical position, legitimize the process. Finally, strong governance mechanisms and structures must be implemented to formalize the process.

The second learning extracted from the field study regards the implication of external stakeholders. NGOs and technical institutes must be involved in the definition of sustainable sourcing criteria. These partnerships have different roles: to provide technical knowledge that

cannot be found internally in the company, to legitimize the company's process in the eyes of the consumers, and to continually challenge the company in an approach of continuous improvement.

The third learning regards the actual definition of the private standards in terms of sustainable sourcing. The studied companies defined precise standards based on a certain approach and definition of what sustainable agriculture is. The implementation of such criteria in agri-food companies contribute to a profound change of a whole chain and go in the direction of a more sustainable agriculture.

Finally, the last learning extracted regards the change in the relationship with the consumer and the need of a strong recognition of context for the sustainable sourcing program to be successfully implemented. Relationship between the sourcing company and the suppliers deeply changed: the implementation of a sustainable sourcing program fostered the communication between the different actors and the suppliers are involved in the definition of the sustainability standards. Relationship with the different supply chain stakeholders are characterized by a strong communication, trust and knowledge dissemination. The field study also highlighted that a financial compensation is a strong incentive for the farmers to onboard the program but that it is not enough. The term of co-creation is essential: the company and the suppliers collaborate in the implementation of these innovative sustainability programs.

At the light of those elements, we can assert that the implementation of those private standards expresses the operation of "translation" that was stated by Landais (1998). Facing a problem as serious and global as the climate change, companies need some concrete tools to be able to transform a scientific problematic into managerial practices applicable to companies.

Finally, we felt the need to focus on a single raw material as we are aware that sustainability has different concrete meanings according to the raw material we are studying. However, the results of the research seem to be applicable to many different raw materials, even not related to food businesses. The need of understanding what the challenges for a certain raw material in terms of environmental impact are, of defining what sustainability means regarding this precise raw material, of defining standards to monitor these environmental impacts and implementing transparency throughout the whole supply chain are common challenges of all sourcing processes. Further research would be necessary to generalize these findings.

To conclude this thesis, it is nonetheless necessary to qualify the above statements. We chose to focus on private standards as it seemed to be a relevant instrument, among many others, for companies to play their part in the fight against climate change, as it is a phenomenon which is today an urgent priority to tackle. Although the redaction of this thesis allowed us to note that

some companies acknowledge their responsibility in the phenomenon of climate change and realize strong investments to fight against it, we must underline that companies strive to measure both the quantity of efforts that must be made and the results of the efforts they already do. To foster corporate world's efforts in terms of fighting climate change, future research would be necessary to be able to quantify companies' impacts on the environment.

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Annex 1 – interview guidelines

Relationship with suppliers

- How is the wheat supply chain organized in your company?
 - o How many wheat suppliers do you have contracts with?
 - o What is the geographical scope of your wheat sourcing?
 - o How many factories do you have?
 - o Can you briefly describe the industrial production process of your product?
- Can you describe your relationship with your suppliers?
 - o How often are you in contact with your wheat suppliers?
 - o Who in your company is in contact with your wheat suppliers?
 - o Are there some intermediaries between you and your wheat suppliers?

Definition of sustainability standards

- Why did you decide to implement sustainability standards for wheat sourcing in your company?
 - o Is there a sustainability policy in your company?
 - o Is sustainability part of the company's values?
- Who were the stakeholders involved in the definition of your sustainability standards?
 - o Company internal stakeholders? (CSR, purchasing department, ...)
 - o Supply chain internal stakeholders? (suppliers, customers, ...)
 - o Supply chain external stakeholders? (NGOs, regulatory authorities, public entities...). If yes, what form does the partnership with NGOs take?
- What criteria did you choose for your sustainability framework?
 - o Were they based on an existing framework? (organic, ISO, other ?)
 - o Is it individual firm standards, collective national standards, collective international standards?
- Are those criteria meant to evolve? If yes, how is the evolution of the criteria decided?

Transition towards sustainable sourcing

- What governance structure was implemented for the transition towards sustainability standards?
 - o Is there a decision making committee?
 - o An information sharing platform ?
- Was the implementation of the sustainability standards progressive or did you involve all your suppliers from the beginning?
 - o How did you choose the first supplier(s) to be involved in the programme ?
 - o How do you gather your suppliers' feedback?

- Was there a conversion period between the moment you chose to implement the standards and the moment the suppliers were compliant to the standards?
- Did your relationship with your suppliers evolve during the implementation of the sustainability standards?
 - o On formal level: are they accompanied with a learning programme ? Do they receive financial incentive for onboarding the sustainability programme ?
 - o On informal level: did you notice any change in your relationship?

Control of the sustainability criteria

- Which mechanisms of control exist? Formal, informal , ...
- What happens in case of noncompliance?

Conclusion

- Overall, what obstacles did you meet during the obstacles of the program? On the other hand, what functioned well?
- What vision do you have for the future of the program?

Annex 6 – Lu Harmony charter in 2018

<p>Choix des parcelles agricoles et implantation de la culture</p>	<ul style="list-style-type: none"> ✓ Sélectionner les parcelles de blé en fonction du <u>précédent cultural</u>, des variétés de blé et du <u>travail du sol</u> pour sécuriser la qualité des blés Harmony et limiter les traitements futurs en particulier contre la <u>fusariose</u>. ✓ Sélectionner des semences de blé non-OGM, certifiées ou des semences directement issues de semences certifiées recommandées pour leur résistance aux maladies et adaptées à la fabrication de nos différents biscuits. ✓ Adapter la date et la densité des semis grâce à des outils d'aide à la décision pour optimiser les conditions de culture et limiter les traitements. ✓ Réaliser une rotation des cultures sur un minimum de 4 cultures sur 5 ans et limiter la succession blé sur blé à 10% à l'échelle du meunier pour limiter le développement des parasites. ✓ Préserver la <u>biodiversité locale</u> en allouant 3% des parcelles de blé Harmony à une zone fleurie attractive et nourricière pour les <u>insectes pollinisateurs</u>, soit située en bordure de champ ou sur une parcelle non utilisée ou en mettant en place une interculture sur la totalité de la surface implantée en blé Harmony avant une culture de printemps, soit en plantant une haie. Il est à noter que les agriculteurs pratiquant le <u>semis direct sous couvert</u> sont exemptés de cette pratique. ✓ Préserver la biodiversité au niveau du territoire en choisissant l'une des 7 actions suivantes : Planter des nichoirs à abeilles sauvages, collaborer avec un apiculteur, planter des hôtels à insectes en bordure de champs, planter des piquets aux alentours des parcelles ou opter pour des perchoirs naturels, réaliser des comptages vers de terre, réaliser 3 relevés terrain « papillon » dans les jachères mellifères ou enfin utiliser une barre d'effarouchement lors de la récolte. ✓ Planter une culture intermédiaire ou interculture pour couvrir le sol pendant l'automne et ainsi le préserver.
<p>Nutrition de la culture</p>	<ul style="list-style-type: none"> ✓ Réaliser des analyses chimiques du sol des parcelles de blé Harmony tous les 6 ans afin d'apporter des éléments fertilisants de manière adaptée et raisonnée. ✓ Définir le <u>plan de fumure</u> des parcelles en utilisant des outils adaptés pour optimiser la culture du blé tout en préservant sur le long terme la fertilité et la qualité des sols. ✓ Ajuster la dose d'azote prévisionnelle soit à l'aide d'un OAD, soit à l'aide d'analyses du niveau d'azote présent dans le sol en sortie d'hiver ✓ Afin de fractionner les apports d'azote et accroître l'efficacité de la dose totale apportée, utiliser un outil de pilotage pour gérer la fertilisation pour 30% des agriculteurs par OS. Proscrire l'utilisation des boues urbaines issues de stations d'épuration (qualifiées par les normes NFU 44095 et NFU 44051). Les déchets agricoles et boues issues des industries type sucre ou pomme de terre restent autorisées.
<p>Santé de la culture</p>	<ul style="list-style-type: none"> ✓ Raisonner les <u>traitements phytosanitaires</u> pour ne traiter qu'en dernière nécessité en mettant en place l'un des leviers suivants pour diminuer la pression des bioagresseurs : semer une variété résistante à au moins une des maladies foliaires principales ou au piétin verse dans les situations à risque, mettre en place une pratique agronomique visant à réduire la pression des bioagresseurs (faux-semis, décalage de la date de semis, labour occasionnel, plantes compagnes...), ou enfin utiliser un outil de pilotage pour intervenir au moment opportun. ✓ Préserver les insectes pollinisateurs en ne réalisant aucun traitement

	<p>phytosanitaire de la culture mellifère.</p> <ul style="list-style-type: none"> ✓ Préserver les <u>insectes pollinisateurs</u> en ne réalisant aucun traitement insecticide sur la culture attenante à la zone en fleur (sauf pour les <u>molécules avec mention abeille</u> autorisées uniquement au coucher du soleil) ni de traitements anti-acariens de la parcelle attenante en intervenant en dehors des périodes de butinage. ✓ Tenir compte des conditions météorologiques avant tout traitement des parcelles pour diminuer les risques de dispersion, conformément à la réglementation. ✓ Pour le choix des matières actives, privilégier le produit ayant le moins d'impact pour la santé de l'applicateur, la faune et la flore, et proscrire les spécialités commerciales avec certaines phrases de risques. ✓ Limiter l'utilisation des régulateurs de croissance en prévenant les risques dès l'amont (choix de la variété, type de sol, date et densité de semis) et en interdisant leur utilisation pour 20% des parcelles par organisme stockeur. ✓ Disposer d'un local dédié aux produits phytosanitaires qui respecte la réglementation et où ils sont conservés dans leurs emballages d'origine, avec leurs étiquettes. ✓ Éliminer les fonds de cuves et les eaux de rinçage grâce à des systèmes de filtrage adaptés pour éviter les pollutions des eaux et des sols. ✓ Le matériel servant aux traitements (pulvérisateur) doit être entretenu, réglé et rincé correctement et un autocontrôle réalisé et enregistré une fois par an en plus du contrôle effectué tous les 5 ans par un organisme tiers spécialisé. ✓ Mettre en place un dispositif pour éviter toute contamination de l'eau utilisée pour remplir le pulvérisateur, conformément à la réglementation.
L'irrigation	<ul style="list-style-type: none"> ✓ Raisonner les apports en eau en évaluant les conditions climatiques régionales, les réserves en eau du sol et les réels besoins de la plante, et justifier et quantifier chaque apport en eau sur la <u>fiche de culture parcellaire</u> (données du sol, bulletin d'alerte, etc.) afin de s'assurer d'une gestion optimale de la ressource.
Gestion des déchets et des sous-produits de l'exploitation	<ul style="list-style-type: none"> ✓ Favoriser, via l'organisme stockeur, la collecte des déchets : Emballages Vides de Produits Phytosanitaires (EVPP), Équipement de Protection Individuelle (EPI), Produits Phytosanitaires Non Utilisables (PPNU), huiles de vidange, batteries, etc.
Le stockage et le transport	<ul style="list-style-type: none"> ✓ Utiliser des unités de stockage du blé (cellule, silo, chambre) ventilées et propres pour diminuer les risques de développement de moisissures ou d'insectes. ✓ Suivre l'évolution des températures de stockage du grain tous les mois dès la moisson en cas de stockage à la ferme pour limiter le risque d'insectes. ✓ Proscrire tout traitement de désinsectisation du blé Harmony et préférer une opération de nettoyage par tamisage et aspiration. Une dérogation exceptionnelle pourra être accordée en fonction d'un protocole d'urgence particulier. ✓ Proscrire tout traitement de désinsectisation des moyens de transport avant chargement du blé et de la farine Harmony, et utiliser des bennes et des citernes vides et propres pour transporter le blé et la farine Harmony afin de ne pas endommager la récolte.
La traçabilité	<ul style="list-style-type: none"> ✓ Identifier et séparer physiquement les lots de blé et farine Harmony pour éviter tout mélange avec des matières premières non Harmony. ✓ Transmettre la liste des agriculteurs et les informations relatives à leurs parcelles à Mondelēz afin de garantir la traçabilité à toutes les étapes de la filière.

	<ul style="list-style-type: none"> ✓ Enregistrer toutes les informations relatives à la parcelle (surface, précédent cultural, variétés de blé, etc.), l'ensemble des interventions réalisées et leur justification, ainsi que des informations relatives à l'exploitation et à l'utilisation d'OAD pour pouvoir calculer des indicateurs agro-environnementaux de chaque parcelle Harmony.
Les hommes	<ul style="list-style-type: none"> ✓ Fournir aux agriculteurs Harmony tous les éléments nécessaires à la compréhension et à l'application de la Charte Harmony en complément de l'appui du service technique, et former et sensibiliser les agriculteurs Harmony aux bonnes pratiques agricoles. ✓ Participer, en tant que chef d'exploitation, à au moins une journée d'information ou réunion / visite technique organisée par l'OS portant sur des techniques innovantes et alternatives.

Annex 7 – La Carta del Mulino charter in 2019

1. Ai coltivatori di grano tenero viene richiesto di rispettare i requisiti della Carta del Mulino la cui corretta applicazione è verificata tramite un ente di controllo indipendente (RINA). Ai Mulini e agli Stocicatori viene inoltre richiesto di certificarsi secondo lo standard **ISCC PLUS** (International Sustainability and Carbon Certification).
2. Le aziende devono adottare, per le colture principali, un piano di rotazione che preveda:
 - una successione minimo quinquennale;
 - almeno tre colture diverse (nel quinquennio) tra cui, obbligatoriamente, almeno una leguminosa;
 - massimo un ristoppio;
 - la successione del grano tenero all’avena, farro, frumento duro, orzo, segale e il triticale è considerato un ristoppio.

Al fine del calcolo del numero di colture nel quinquennio, il grano tenero non si differenzia dal grano duro, farro e triticale perché tutte appartengono allo stesso genere botanico. Nel caso di presenza di erba medica per almeno tre anni nel quinquennio di riferimento non è necessario avere tre colture.
3. Creazione di aree d’interesse ecologico inerbite con semina di mix di piante a fiore (leguminose e/o specie di altre famiglie di piante nettariifere) costituite da:
 - fasce inerbite temporanee, posizionate all’interno delle stesse parcelle a grano tenero, aventi una dimensione minima equivalente al 3% della SAU a grano tenero coinvolta nel progetto “Carta del Mulino”;

OPPURE

 - fasce inerbite temporanee, posizionate a non più di 5 metri dai confini della parcella a grano tenero, aventi una dimensione minima equivalente al 3% della SAU a grano tenero coinvolta nel progetto “Carta del Mulino”;

OPPURE

 - fasce o aree inerbite permanenti, aventi dimensioni minima equivalente al 3% della SAU a grano tenero coinvolta nel progetto “Carta del Mulino”. Le aree d’interesse ecologico permanenti devono derivare dalla SAU aziendale, incrementando le aree preesistenti al 2017.

È vietato il trattamento con prodotti chimici in tutte le aree d’interesse ecologico ed è permesso solo uno sfalcio, dopo la fioritura.
4. Uso delle varietà di frumento indicate da Barilla
5. Vengono utilizzate solo sementi certificate di cui vengano garantite identità, purezza varietale, germinabilità e sanità. Inoltre è vietato l’utilizzo di materiale vegetale OGM.
6. È vietato l’uso di neonicotinoidi per il trattamento del seme

7. È vietato l'uso del glifosate dalla semina fino al raccolto e, grazie all'ente di Controllo RINA, verifichiamo il rispetto della regola non solo in Italia (dove l'utilizzo del glifosato è già vietato, solo nella fase di pre-raccolta*) ma anche in quei Paesi in cui sarebbe consentito dalle normative locali.
8. Le partite di grano tenero ottenute secondo le regole della "Carta del Mulino" devono essere raccolte e consegnate separatamente da tutte le altre.
9. Le strutture per la conservazione del grano e i mulini devono assicurare l'identificazione e una gestione dedicata dei lotti di grano tenero appartenenti al progetto "Carta del Mulino".
10. Per conservare il grano chiediamo di utilizzare metodi fisici (come la refrigerazione o l'atmosfera modificata), così come metodi ammessi in agricoltura biologica e di limitare l'utilizzo di sostanze chimiche