

Towards Credible Standardization of Sustainable Dairy Production

A strategic collective system building approach for the implementation of the Dairy Sustainability Framework at FrieslandCampina

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FrieslandCampina nl

Utrecht, 4th December 2015

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Summary

This research focuses on a strategic sustainability innovation that enables a market transformation. In order to create positive social, environmental and economic impact, scientists argue that sectors should move beyond competing on sustainability standards and towards a more collaborative process approach towards sustainability. The dairy sector aims to do this through the implementation of the Dairy Sustainability Framework (DSF), a process approach towards standardization of sustainable dairy production that enables them to implement a sustainability strategy with a common language and vision that can be applied globally, nationally, regionally and within organizations. However, as the approach of the DSF is new, flexible, collaborative and different from the conventional standards, it is a challenge for dairy companies to implement such a strategic sustainability innovation. The objective of this research is to understand the market transformation of the dairy sector in terms of strategic collective system building and to find out how the dairy sector can implement the DSF in a credible manner.

In order to answer the research question, a theoretical framework based on market transformation and strategic collective system building was used. Until now, this theoretical framework has mostly explored technological innovation and had not been validated for other types of innovation yet. Therefore, this research performed a case study on the implementation of the DSF at FrieslandCampina in the Netherlands, which was done in collaboration with two key customers and other stakeholders through a pilot. To collect data, desk research, 26 in-depth interviews, observations, and comparable food case studies in the cocoa and coffee sector were carried out.

Empirical data showed that market transformation is crucial for positive social, environmental and economic impact in the dairy sector. Also, a validation of the strategic collective system building framework showed that most of the system building activities seem to be relevant in the dairy sector. But, empirical findings also revealed that several additional activities are needed to implement the DSF in a credible manner. Therefore, this thesis proposes a refinement of the strategic collective system building framework. This refinement includes: attitudinal and instrumental commitment as a precondition for strategic collective system building; a change of the concept coordination into the concept governance to capture more formal mechanisms of coordination; the use of levels of maturity of sustainability performance and implementation as a way for standardization of the innovation; the creation of transparency by including minimum standards, monitoring, reporting, verification and traceability; and, the inclusion of communication in the definition of governance.

The refined strategy framework enables actors within an innovation system to build a strategic collective system and thereby move beyond standards and towards a collaborative process approach towards sustainability in order to create positive social, environmental and economic impact. Also, it empowers them to have more control of the collaboration in order to successfully implement their sustainability innovation in a credible manner through the inclusion of formal mechanisms of control.

Acknowledgements

I would like to express special gratitude to two persons in particular, namely my academic supervisor *prof. dr. Ellen Moors* and my internship supervisor *Jaap Petraeus MSc*. First, I would like to thank Ellen Moors for her supervision throughout the entire period of writing this thesis. Not only has she given me professional guidance and analytical feedback, but also did she ask me just the right questions to inspire and motivate me during the meetings. Second, I would like to thank Jaap Petraeus for giving me the opportunity to do such an interesting and special internship at FrieslandCampina. He offered me a challenging practical internship that enabled me to join the implementation of an international innovative sustainability strategy in the dairy sector with lots of responsibility and learning experiences.

Also, I would like to thank *all those who I have interviewed and discussed with*. Not only has this enabled me to learn much about the dairy sector and FrieslandCampina in a short time, but also gave it insight in all the different ideas about how to implement the Dairy Sustainability Framework in a credible manner and in the activities needed to create a framework that leads to a more sustainable dairy sector.

In addition, I would like to thank *Krijn Turkenburg* for the never-ending discussions and brainstorming about sustainability at FrieslandCampina, the feedback on my thesis and humor during the internship. Finally, I would like to thank my *family and friends* for their continuous concern and loving support.

List of abbreviations

B2B	Business-to-business
B2C	Business-to-consumers
CEO	Chief Executive Officer
CI	Continuous improvement
CO2	Carbon dioxide
CSR	Corporate Social Responsibility
DSF	Dairy Sustainability Framework
EDA	European Dairy Association
ESADA	Eastern and Southern African Dairy Association
FAO	Food and Agriculture Organization
FEPALE	Pan-American Dairy Federation
GDAA	Global Dairy Agenda for Action
GDP	Global Dairy Platform
GVC	Global value chain
IDF	International Dairy Federation
IFCN	International Farm Comparison Network
IPCC	Intergovernmental Panel on Climate Change
KPI	Key Performance Indicator
NGO	Non-Governmental Organization
PDCA	Plan-Do-Check-Act
PDSA	Plan-Do-Study-Act
RSPO	Roundtable for Sustainable Palm Oil
SAI	Sustainable Agricultural Initiative Platform
SCSB	Strategic Collective System building
TIS	Technological Innovation Systems
USA	United States of America
WG	Working Group
WWF	World Wide Fund

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Preface

This Master Thesis is part of the Master Sustainable Business and Innovation in the department of Geosciences of Utrecht University and was supervised by prof. dr. Ellen Moors. The research performed for this thesis was conducted through an internship at Royal FrieslandCampina N.V. from May till December 2015, which was supervised by Jaap Petraeus MSc. The internship was part of a larger pilot project performed by FrieslandCampina in collaboration with two key customers on the implementation of the Dairy Sustainability Framework (DSF), with the scope dairy production and processing in the Netherlands. The pilot runs from March 2015 till October 2016.

The DSF is a global framework aiming for international standardization of sustainable dairy production. It was developed in 2013 by SustainAbility after the initiative of the global dairy sector to commit to CO₂ reductions through the Global Dairy Agenda for Action (GDAA) in 2009 (GDAA, 2014b). Since its development, the DSF has obtained many members worldwide that aim to work according the DSF (see Appendix A). Currently, five pilots are performed by dairy companies worldwide in order to review the implementation process of the DSF in several regions, namely Ireland, United States of America (USA), Indonesia, New Zealand and the Netherlands. The results of these pilots will be presented during the International Dairy Federation (IDF) World Dairy Summit in Rotterdam in 2016 (see Figure 1 for a timeline of the DSF). Although all pilots are focused on stakeholder engagement, materiality analyses and the formulation of objectives and Key Performance Indicators (KPIs) for sustainable dairy production, FrieslandCampina has added two additional objectives. First, through the implementation of the DSF, FrieslandCampina aims to be able to demonstrate its sustainable dairy production and processing to its stakeholders (customers, government, research, NGOs, banks and farmers) and second, to reduce the number of audits at farm level as this is very costly and time-consuming.



Figure 1. Timeline development and implementation of the Dairy Sustainability Framework

Before the start of the pilot at FrieslandCampina, an overview of all relevant stakeholders was made. These stakeholders include farmers, customers, non-governmental organizations (NGOs), governments, banks and research. In order to secure stakeholder engagement, most of these stakeholders were also included into either the steering or the advisory board of the pilot. In order to meet the objectives, three working groups (WG) were assigned by the pilot initiators on performance criteria (WG1), external substantiation (WG2), and value creation (WG3). Working group 1 consists of a sustainability manager of FrieslandCampina, a research organization and a NGO. Working group 2 consists of Sofie van Olst. And, working group 3 consists of a business-to-

business marketing representative of FrieslandCampina. This thesis was written as part of working group 2: external substantiation. In this working group, the objective was to find what is needed to build credibility for the implementation of DSF within FrieslandCampina by its stakeholders. This means creating an overview of the additional required activities to get fully trusted by stakeholders. To kick-start the pilot in the Netherlands, a meeting was held with the steering and advisory board and all working group members. The results of working group 2 will be presented to the steering and advisory board of the pilot at the end of 2015.

1. Introduction

1.1. Background

In their latest report on climate change, the Intergovernmental Panel on Climate Change (IPCC) states that “human influence on the climate system is clear and growing, with impacts observed across all continents and oceans” (IPCC, 2014, p. V). They claim that recent anthropogenic emissions of greenhouse gases measured are the highest in history (IPCC, 2014, p. 2). The human influence on climate change seems even more relevant in the near future, as world population is expected to grow exponentially in the coming years to a population size of over 9.5 billion people in 2050 (United Nations Department of Economic and Social Affairs Population Division, 2013).

A large problem related to population growth is the required increase in global food supply. Furthermore, not only is the number of people growing, also wealth is increasing, leading to higher consumption of food, meat, dairy, and fish (Charles et al., 2010). Meanwhile, “food producers are experiencing greater competition for land, water, and energy, and the need to curb the many negative effects of food production on the environment is becoming increasingly clear” (Charles et al., 2010, p. 812). Therefore, the food industry is facing much pressure to be able to feed the increasing and wealthier world population, while both decreasing the negative social and environmental impact and remaining competitive.

One of the sectors in the food industry that is currently working towards becoming more sustainable is the dairy sector. In the Netherlands alone, the dairy sector consists of 18,000 farmers, holding 1.8 million cows that produce 12.7 billion liters of milk (Roland Berger Strategy Consultants, Nederlandse Zuivel Organisatie, & ZuivelNL, 2015). Dairy products are thought to be very nutrient rich, affordable, accessible and are being consumed worldwide (Miller & Auestad, 2013). Also, they are associated with lower risk of major chronic diseases, including cardiovascular diseases, type 2 diabetes and hypertension, and the associated healthcare costs (McCarron & Heaney, 2004).

However, the dairy sector is, next to the economic and nutritional profit, highly related to a number of sustainability issues. With regard to the environmental impact of the dairy sector, eutrophication, groundwater pollution, dehydration of the soil, acidification, and biodiversity loss are the most well-known sustainability issues (Calker, Berentsen, Giesen, & Huirne, 2005). Also, Calker et al. (2005) found that the most discussed social issues related to the dairy sector are food safety, animal welfare and health, landscape quality, use of undisputed products and working conditions. With regard to food safety, several diseases like foot-and-mouth disease and mad cow disease had a major impact on the awareness of the social issues related to the dairy sector (Calker et al., 2005; Reinders & Vernooij, 2013, Chapter 8).

1.2. Problem description

As the sustainability challenges in the food sector are evident, a huge challenge lays ahead for society to be able to feed over 9 billion people in a sustainable manner. Companies, governments, non-governmental organizations (NGOs) and individuals will need to work together in order for this challenge to be tackled. Businesses of all sizes increasingly require assurance that their suppliers produce in a sustainable manner (ISEAL, 2010). Often this means that, within the global value chain (GVC), large food producers put much pressure on their suppliers by using long checklists to check and assure sustainability. Many sectors in the food industry apply this ‘tick-in-the-box’ approach towards sustainability with the use of standards (Silva-Castañeda, 2012). Standards within the dairy sector include meadow milk (Stichting Weidegang, n.d.) and organic dairy (i.e. Arla, n.d.; Campina, 2013; Weerribben Zuivel, n.d.). However, as Lucas Simons states in his book ‘Changing the Food Game’ (2015), based on observations in the food sector, competition with standards does not make a real positive impact for the environment and society, and media and customers are often no longer interested in a new label or standard. A more collaborative, international and industry-wide approach towards sustainability with institutionalization and adoption of a large part of the industry is needed in order to truly create a positive social,

environmental and economic impact (Simons, 2015). This means that a transformation of the market is required (Simons, 2015).

In order to tackle the sustainability challenges in the dairy sector, the Global Dairy Agenda for Action (GDAA) was founded in 2009 by six large international dairy organizations, namely the European Dairy Association (EDA), Eastern and Southern African Dairy Association (ESADA), Pan-American Dairy Federation (FEPALE), Global Dairy Platform (GDP), International Dairy Federation (IDF) and Sustainable Agricultural Initiative Platform (SAI) (GDAA, 2014b). In 2012, the Global Dairy Platform (member of the GDAA) asked the think-tank and advisory company SustainAbility to develop a global framework with overarching goals and alignment of the sector's actions, the so-called *Dairy Sustainability Framework* (DSF) (see Figure 2). The DSF provides actors in the dairy sector with an holistic process approach towards the standardization of sustainable dairy production that enables them to implement a sustainability strategy with a common language and vision¹ that can be applied globally, nationally, regionally and within organizations (GDAA, 2014c). The process approach is defined through *continuous improvement*, namely "a company-wide process of enabling a continuing stream of focused incremental innovation" (Bessant, Caffyn, Gilbert, Harding, & Webb, 1994, p. 17). The DSF gives room for regional differences and prioritization of sustainability issues so that companies can adjust the DSF to their sustainability strategies and existing initiatives. Companies in different regions might have different targets and performance milestones regarding certain sustainability issues. Although this means that not all companies perform equally on the sustainability issues, the continuous improvement approach of the DSF enables a global upward lift of sustainability within the dairy sector. The DSF has defined 11 global sustainability issues (categories) within the dairy sector, namely greenhouse gas emissions, soil nutrients, waste, water, soil quality, biodiversity, market development, rural economies, working conditions, product safety & quality and animal care (SustainAbility, 2013). These issues all have a strategic intent, which gives the vision for this issue (see Appendix B). The DSF also uses enablers, namely governance structure and stakeholder dialogue to support the implementation.

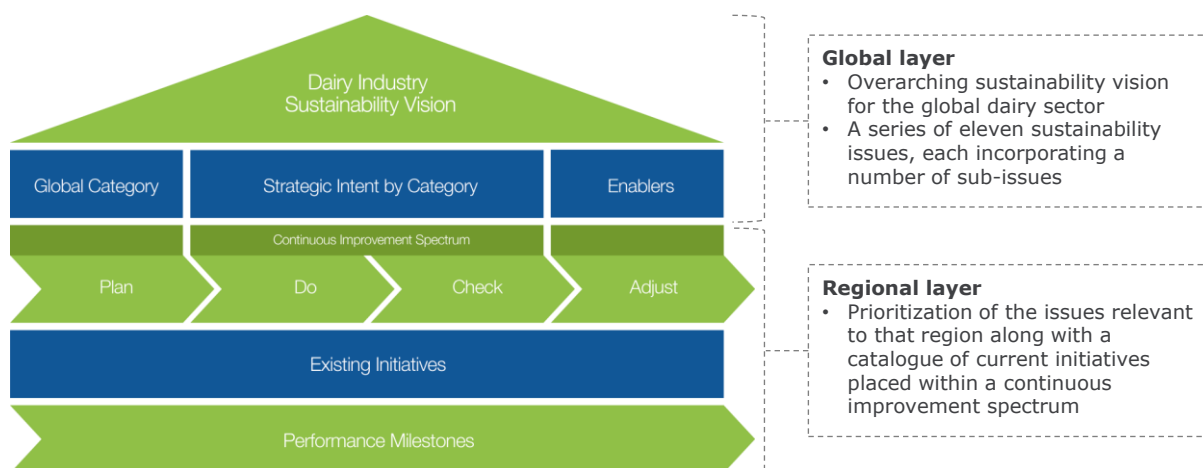


Figure 2. The Dairy Sustainability Framework (based on GDAA, 2014a)

Due to the continuous improvement approach, the DSF is focused on the *process of standardization* rather than the end status of creating a standard (Cameron, Ayars, & Thissen, 2012). The DSF triggers market transformation of moving beyond standards and towards collaboration in the international dairy sector and therefore fits in the new approach towards sustainability described by Simons (2015). The change from an industry with standards to an

¹ The DSF is built upon the following vision: "A vibrant dairy sector committed to continuously improving its ability to provide safe and nutritious products from healthy cattle, whilst: Preserving natural resources; and, ensuring decent livelihoods across the country" (GDAA, 2014c, para. 3).

industry that is *collectively* working towards becoming more sustainable requires companies that are normally competing with each other to work together, to trust each other, to share information and to agree upon strategies instead (Simons, 2015). The implementation of DSF within the dairy sector can therefore be seen as a strategic innovation. Following the definition of Markides, "strategic innovation occurs when a company identifies gaps in the industry positioning map, decides to fill them, and the gaps grow to become the new mass market" (Markides, 1997, p. 12). Strategic innovation is therefore "a fundamental reconceptualization of what the business is all about that, in turn, leads to a dramatically different way of playing the game in an existing business" (Markides, 1998, p. 32). Strategic innovations are being implemented in system, meaning that it is initiated, imported, modified and diffused by networks of institutions both private and public (Hekkert & Negro, 2009). As for the implementation of DSF at a firm this means that the innovation system comprises of all actors, institutions, relations and networks that are related to the implementation of the DSF.

The societal relevance of this research lies within finding ways for companies in all kinds of sector to implement a process approach towards standardization of sustainability in a credible manner and, especially, for the implementation of DSF in the dairy sector. The process and standardization approach of the DSF is new, flexible and different from the conventional standards. Therefore, it is a challenge to implement such a strategic sustainability innovation in an innovation system in a *credible manner*. *Credibility* has been defined here as the likelihood of achieving "the ultimate aim of bringing about positive social, environmental and economic impacts while decreasing negative impact" (ISEAL, 2013, p. 18). As only few industries are currently moving beyond standards and towards a more collaborative approach towards sustainability (Simons, 2015), guidelines or best practices for the implementation of such a new innovation are missing or still under development. In order to implement this collaborative and process approach towards sustainability in a credible way and therewith enabling sectors, among which the dairy sector, to collectively create an increased positive social and environmental impact, research is needed to create these new guidelines or best practices.

The theoretical relevance of this research lies within understanding the collaborative innovation system in which the DSF needs to be implemented and describing the dynamics of this system. For the theoretical background innovation literature was used. Moreover, within technological innovation systems literature (Hekkert, Suurs, Negro, Kuhlmann, & Smits, 2007; Geels, Hekkert, & Jacobsson, 2008; Hekkert & Negro, 2009), much has been written on the implementation of collective or collaborative systems. The DSF as a strategic innovation is implemented in an innovation system. However, due to the collaborative approach of the DSF, implementation needs to be done in a collaborative way too, meaning that the DSF needs to be implemented in a collaborative system. According to market transformation literature, moving beyond standards requires a new approach or innovation system that includes collaboration, institutionalization and adoption of a large part of the industry (Simons, 2015). Planko, Cramer, Chappin and Hekkert (2015) defined the implementation of these collaborative systems as *strategic collective system building*, namely working together in networks or collaborations in order to strengthen the position and impact of new technological innovation in the market. The literature on collective system building even provides a practical strategy framework for the implementation of strategic collective system building (Planko et al., 2015). However, their strategy framework is solely designed for technological innovation and has not been validated for other types of innovation. Since the implementation of DSF can be seen as a strategic innovation, this research provides an account of how strategic collective system building does not only apply to technological innovation, but also contributes to the credible implementation of a strategic innovation yet. Furthermore, Planko et al. (2015) use a combination of strategic management (micro) and technological innovation systems (meso) literature. As this approach is relatively new, more research is needed to increase knowledge on the combination of meso and micro levels within innovation literature and to validate the strategic collective system building framework as developed by Planko et al. (2015). Therefore, this research aims to validate the robustness of strategic collective system building when applied to a pilot in the food sector currently implementing an innovative sustainability strategy.

1.3. Aim and research question

As there is a clear societal and scientific need to find a credible manner to implement the DSF – a framework with a process approach towards standardization of sustainability dairy production – the aim of this thesis is to understand the market transformation of the dairy sector in terms of strategic collective system building in order to develop a strategy framework for the credible implementation of the DSF. However, before this can be done, it is important to understand the market transformation of the dairy sector, the innovation system in which the DSF is being implemented in terms of strategic collective system building and the impact of the market transformation on the credible implementation of the DSF.

Two research questions follow from this problem definition. The first research question is focused on understanding the market transformation of the dairy sector implementing the DSF through strategic collective system building:

How to understand the market transformation of the dairy sector in terms of strategic collective system building?

Subsequently, to find a strategy framework for the implementation of DSF, the way in which the dairy sector can implement the DSF in a credible manner needs to be analyzed. This leads to the second research question:

How can a process approach towards standardization of sustainable dairy production be implemented in a credible manner in a transforming dairy sector?

The sub questions that need to be analyzed to answer the research questions are the following:

1. How can the transformation of the dairy sector be described and what is the role of the DSF within this transition?
2. How is credibility defined within the dairy sector and what activities are needed in order to build credibility?
3. What lessons can be learned from comparable sectors in the food industry that are currently implementing a collaborative, sector-wide approach towards sustainability?

The research was part of a thesis internship performed at FrieslandCampina. Therefore, the research will be specifically focused at the implementation of the DSF at FrieslandCampina in the Netherlands. Globally five pilots are taking place with companies that are implementing the DSF, namely in Ireland, USA, Indonesia, New Zealand and the Netherlands. The internship was part of one of these pilots, namely the DSF pilot of FrieslandCampina in collaboration with two key customers. FrieslandCampina wants to become a frontrunner in the implementation of the DSF and therefore started a pilot in the Netherlands. The pilot will lead to lessons-learned and might eventually lead to becoming a role model for other companies wanting to implement the DSF. In the pilot three working groups (WG) are formed that will work on the performance criteria (WG1), external substantiation (WG2), and value creation (WG3). This thesis is part of working group 2 and falls under the enablers part of the DSF (see Figure 2). The scope of the pilot is dairy production and processing in the Netherlands and runs from March 2015 till October 2016.

1.4. Outline of the thesis

This thesis is structured as follows; section 2 presents an overview of the theoretical concepts used to tackle the research problem. Section 3 gives the methods, including the research design, data collection and data analysis. Subsequently, section 4 gives the findings of the research, after which an analysis of the empirical data is discussed in section 5. Next, conclusions, limitations of the research and possible future research are presented in section 6 and 7. And, finally, an advice to the internship organization is given in section 8.

2. Theory

2.1. Beyond standards and towards transformation of the dairy sector

Nowadays, sustainability standards are becoming widely used in sustainability strategies (ISEAL, 2010). Although the use of sustainability standards and certifications is growing with already over 450 ecolabels² in use, many challenges are associated with the use of these standards and certifications. Among others, cost of use, effectiveness and impact, customer confusion, greenwashing and lack of brand advantage are thought to be barriers of certification (ISEAL, 2010; Steering Committee of the State-of-Knowledge Assessment of Standards and Certification, 2012). Also, Watanatada and Mak (2011) argue that certification and labelling face limits to scale. According to their research, it will not be possible to certify everything and at every factory or farm (Watanatada & Mak, 2011). They even argue that it is time to rethink the 'classic' sustainability label and move towards a more flexible, collaborative model for influencing sustainability outcomes. This includes stronger supplier-buyer relations, the use of brands to show sustainability, the use of national regulation and partnerships (Watanatada & Mak, 2011) (see Figure 3).



Figure 3. Moving beyond standards and towards industry-wide collaboration

The process of going beyond using standards as a means to become more sustainable and towards a more collaborative approach towards sustainability is also described by Simons (2015) in his market transformation model for systemic change in the agricultural sector. He observed that markets that are in a state in which negative feedback loops of failing market and governments exist, perform certain action-reaction patterns (Simons, 2015). To overcome these negative feedback loops, he designed a market transformation process with four phases that subsequently improve the sustainability outcomes of a market (see Figure 4)(Simons, 2015):

1. **Awareness and project phase:** A crisis or innovation will raise general awareness about the sustainability issues in the sector and creates room for first responses by the sector. Companies react by implementing small projects individually;
2. **First mover and competition phase:** First movers gain a competitive advantage by implementing sustainability strategies. Other companies follow and standards are being implemented, after which a competition on standards emerges;

² Retrieved from Big Room Inc. Ecolabel Index at www.ecolabelindex.com on the 8th June 2015.

3. **Critical mass and institutionalization phase:** The impact of standards and individual strategies are minimal and companies join in non-competitive collaboration on neutral ground. The interconnectedness, 'connectability' and trust increases and a clear vision and roles and responsibilities are laid out. Also, government joins in (see capitol illustration in Figure 4);
4. **Level playing field phase:** From collaboration to legislation and making the new strategies the industry norms. Government will codify the input of the industry, laggards will need to follow. This is not an end phase, as the process will start over again with a new innovation or crisis that triggers change.

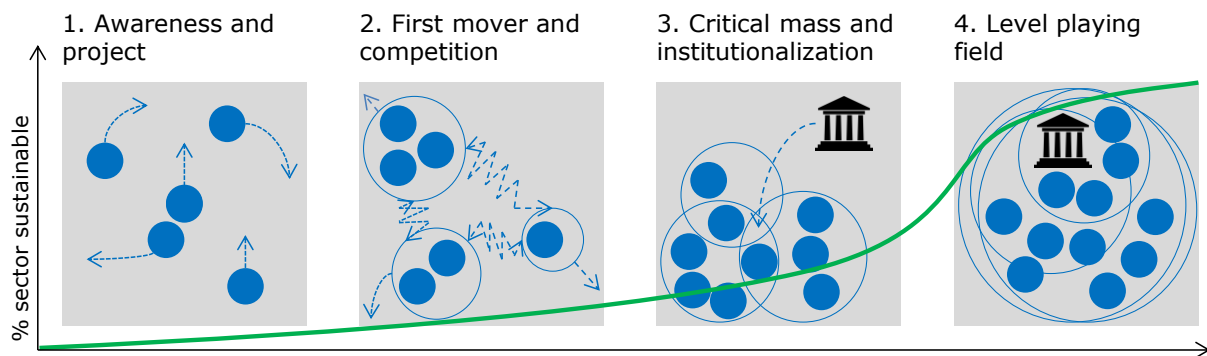


Figure 4. The market transformation curve with four distinct phases (Simons, 2015)

While going through these phases, the level of sustainability increases, known as the market transformation curve (Simons, 2015). Phase 3, in which companies move from competing on standards to collaboration and connectability, is comparable to the phase of moving beyond standards by Watanatada and Wak (2011) and the approach that the dairy sector is taking with use of the DSF.

2.2. Market transformation and strategic collective system building

Phase 3, as described by Simons (2015), of moving beyond standards and going towards more collaboration and institutionalization is not only supported by empirical sustainability literature (Watanatada & Mak, 2011), but also found in strategic management literature. According to strategic management literature, companies collaborate in networks or clusters to compete with other technologies and need to invest in changing the business ecosystem in which they operate (Planko et al., 2015). According to van de Ven's theory on 'entrepreneurial infrastructure' (1993), companies should develop their own strategy, but also need to collaborate with other actors in the global value chain in order to build an infrastructure that fosters a fast diffusion of the technology. This includes market consumption, institutional arrangements, resource endowments and proprietary activities (van de Ven, 1993). Through this collaboration, the technology is more likely to become successful (van de Ven, 1993, 2005).

Strategic management literature is mostly firm – and therefore micro – focused. Planko et al. (2015) argue that as strategic management literature does not offer insights into building the supportive external environment, it needs to be complemented with insights from innovation studies. They argue that firms need to collaborate in order to change the business ecosystem or the meso/macro level of the system. According to Geels (2002), this includes changes in society such as user practices, industrial networks and regulation. In order to describe sustainable socio-technical change, namely "a structural re-orientation of economic activity towards sustainability" (Hekkert & Negro, 2009, p. 584), an *innovation systems* approach can be used (Hekkert & Negro, 2009). Innovation systems can be defined through Freeman's (1987) definition as: "...networks of institutions, public or private, whose activities and interactions initiate, import, modify, and diffuse new technologies" (recited from Hekkert & Negro, 2009, p. 585). Innovation systems comprise of a number of agents, relations and institutions.

To describe sustainable socio-technical change systems that focus on the development, diffusion and implementation of a particular technology, *technological innovation systems* (TIS) literature can be used (Bergek, Jacobsson, Carlsson, Lindmark, & Rickne, 2008; Hekkert, Suurs, Negro, Kuhlmann, & Smits, 2007). This approach also takes into account the dynamics in an innovation system (Hekkert et al., 2007). TIS can be defined as: “a network or networks of agents interacting in a specific technology area under a particular institutional infrastructure to generate, diffuse, and utilise technology” (Carlsson & Stankiewicz, 1991, p. 94). Within TIS literature the process of changing a business environment is explained in the term *system building*, defined as “the deliberate creation or modification of broader institutional or organizational structures in a technological innovation system carried out by innovative actors. It includes the creation or reconfiguration of value chains as well as the creation of a supportive environment for an emerging technology in a more general way.” (Musiolik, Markard, & Hekkert, 2012, p. 1035) The technological innovation systems literature offers many practical examples and frameworks of various technological innovation systems.

By combining technological innovation systems literature and strategic management literature, Planko et al. (2015) were able to build a strategy framework that enables entrepreneurs to effectively change the business environment so that their innovation will become successful. According to Planko et al. (2015), this co-creation of a business ecosystem can be strategic and is thus formulated as *strategic collective system building* (SCSB), defined as “the strategic activity of networks of entrepreneurs and entrepreneurial managers to build up a supportive environment and infrastructure for their innovative sustainability technology” (Planko et al., 2015, p. 4).

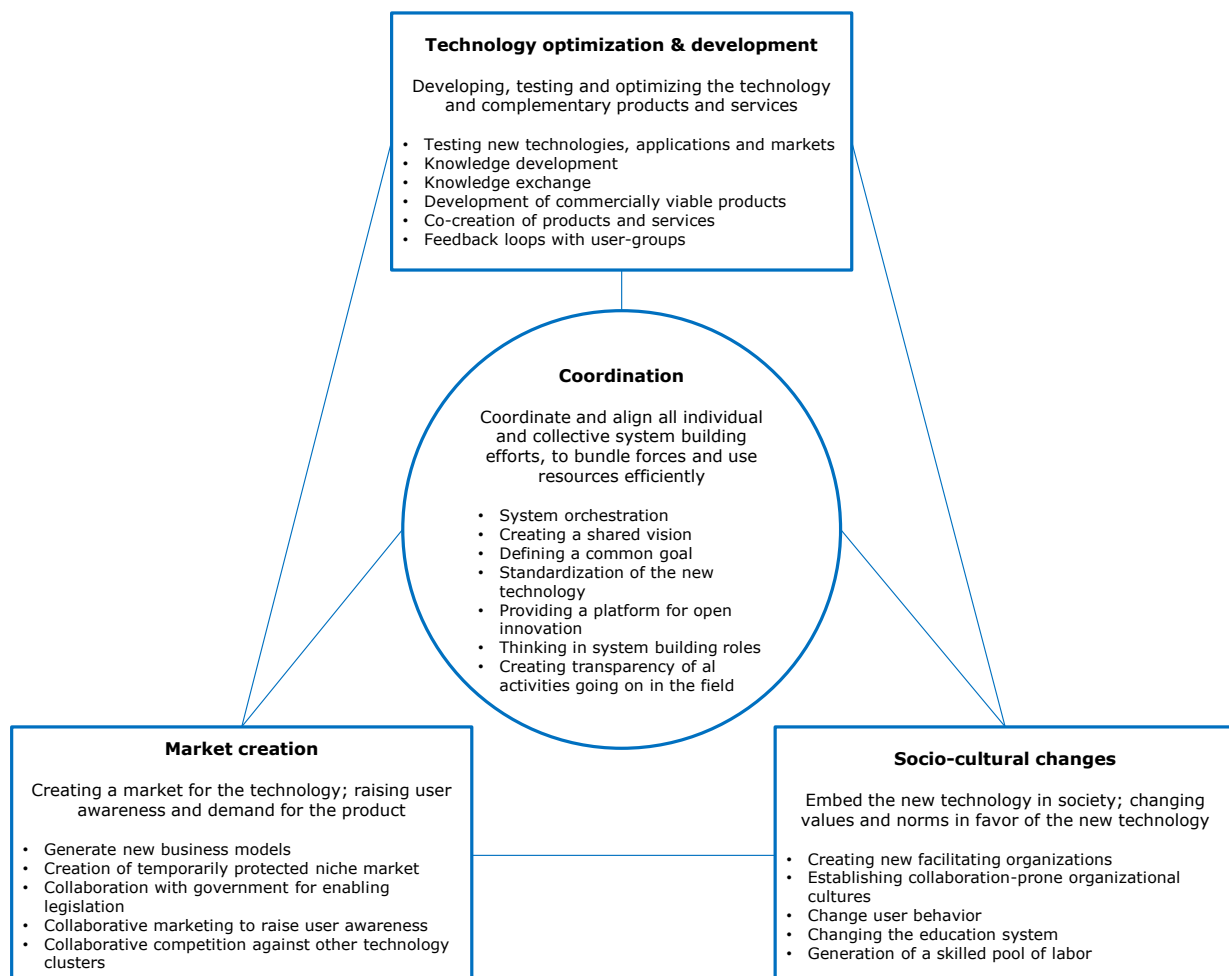


Figure 5. Strategy framework for strategic collective system building (based on Planko et al., 2015)

The development of a strategic collective system is comparable to the development within the dairy sector that is currently moving towards more collaboration in the sector through the implementation of the DSF. Therefore, the strategy framework of Planko et al. (2015) might be of use for the development of a credible implementation strategy for the DSF. The strategy framework of Planko et al. consists of four clusters, namely coordination, technology optimization & development, socio-cultural changes and market creation (see Figure 5). Within these four clusters, several activities to strategically build a collective system are described. Among others, a shared vision and common goal were found to be an important step within strategic collective system building. According to Planko et al. (2015, p. 10), "ideally, system-building entrepreneurs should align their company goals towards the achievement of this common goal". Another activity that Planko et al. (2015) found is the need to have standardization for the co-development of products and services. They argue that "standardization is necessary to build a compatible, reliable new system, in which customers and end-users can easily switch between suppliers or brands" (2015, p. 10). This need for standardization is also covered in the standardization approach of sustainability in the dairy sector with the use of the DSF.

2.3. Finding new ways for credible implementation of sustainability strategies

The combination of literature on market transformation and strategic collective system building is relevant for this research. Literature on market transformation will enable to get an idea of the context of the problem and the reason why the dairy sector should move towards a collaborative approach towards sustainability. And, in order to build such collaboration, strategic collective system building will become relevant. Although empirical sustainability literature is focused on transforming the market in such way that it will increase the impact of a sustainability strategy, rather than the successfulness of a new technology in TIS literature, both types of literature focus on collaborative or collective action and changing the environment in which companies are operating. Also, both describe the development of a shared vision, knowledge sharing, co-creation and collaboration as being needed to change the business ecosystem to become more successful or to become more sustainable.

Although both Simons (2015) and Planko et al. (2015) argue that a shared vision and collaboration is needed in order to become more successful or sustainable, currently only few sectors are moving towards a market in which companies have this shared vision, are collaborating on sustainability strategies and are going beyond competing on standards (Simons, 2015). This phase of market transformation is relatively new and therefore poses some challenges to companies, including building trust and sharing information (Simons, 2015). The theoretical framework as proposed here helps to answer the research questions. In order to answer the first question, namely to describe the market transformation within the dairy sector through strategic collective system building, concepts from market transformation and strategic collective system building were used. First, the dynamics in the system are important to understand, because this gives a better understanding of the context of the problem. Afterwards, system building activities found within the data are demonstrated to see how the market transformation of the dairy sector can be described through strategic collective system building. In order to answer the second research question, namely to find how the dairy sector can implement the DSF in a credible manner, a refined strategy framework can be developed through insights derived from the findings.

Also, as described, the DSF has a *process approach* towards the standardization of sustainable dairy production. This process approach is defined through *continuous improvement*, namely "a company-wide process of enabling a continuing stream of focused incremental innovation" (Bessant et al., 1994, p. 17). Therefore, the DSF aims to move towards sustainable dairy production in an incremental way. A theoretical explanation of continuous improvement can be found in Appendix B.

3. Methodology

This section describes the research methodology. First, section 3.1 explains the research design, including a description of the case study performed. Next, section 3.2 describes the data collection including an explanation of the desk research, interviews and observations. Section 3.3 gives an overview of the way in which the data is analyzed and, subsequently, section 3.4 describes what has been done in order to improve the quality of the research.

3.1. Research Design

The objective of the research was to understand the market transformation of the dairy sector in terms of strategic collective system building and, subsequently, to find out how the dairy sector can implement the DSF in a credible manner. To reach these objectives, an explanatory qualitative research was conducted. A special type of pattern matching, namely explanation building was used to analyze the data. Explanation building is the attempt to build an explanation while collecting and analyzing data, rather than testing a projected explanation (Yin, 2003). Although similar to exploratory research and grounded theory (Yin, 2003), "explanation building is designed to test a theoretical proposition, albeit in an iterative manner, rather than to generate theory inductively" (Saunders, Lewis, & Thornhill, 2009, p. 500). The explanatory research facilitated to find how the market transformation within the dairy sector can be explained through the theoretical proposition of the strategic collective system building literature and allowed, by means of a limited number of observations, to identify the main variables in the framework and their relationships. Consequently, it found methods for the credible implementation of the DSF.

A case study on the implementation of the DSF within FrieslandCampina in the Netherlands facilitated the comparison of collected data with the theoretically based proposition. Analyzing an initial case study is part of the explanation building procedure according to Yin (2003) and is defined as 'an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence' (Robson, 2002, p. 178). The analysis of this case led to an in-depth description and understanding of the implementation of the DSF in the dairy sector. Also, new data has led to the refinement of concepts, representing the integration of the theoretical framework with the results of the case study, and thereby building on the existing literature to fully understand the implementation of a strategic innovation. The research aimed to generalize results to theory, rather than to provide full evidence or truth statements.

Although this research is mostly focused on a single case study, the research included observations and interviews with many stakeholders within the value chain, external stakeholders and sustainability and certification experts (see section 3.2 and Appendix B). Also, it made use of comparable cases in order to be able to generalize some of the outcomes. The comparable cases that were useful for the research are the coffee and cocoa sector. In his research, Simons (2015) analyses the market transformation phases through three case studies, namely the coffee, palm oil and cocoa sector. The palm oil sector is currently in phase 2, whereas the coffee and cocoa sectors are moving towards phase 3. The cocoa and coffee sector are currently the only two sectors in the food industry that are, next to the dairy sector, moving beyond standards and working towards a collaborative sector-wide approach towards sustainability and are therefore comparable to the dairy sector. The comparable cases were used to illustrate the importance of some of the systems-buildings activities found through the data analysis and to validate the empirical findings of this research.

3.1.1. Case study: the implementation of the DSF at FrieslandCampina

Royal FrieslandCampina N.V. was chosen as the case for this research as it is one of the first companies to implement the DSF in its sustainability strategy and is therefore currently in the process of moving towards a market phase that introduces collaboration across the global value chain in order to improve its sustainability performance. The Netherlands was chosen as a focus area in this case study as FrieslandCampina's main business activities take place in the Netherlands.

Royal FrieslandCampina N.V. is one of the world's five largest dairy companies, headquartered in Amersfoort, the Netherlands. FrieslandCampina globally supplies various consumer products such as dairy beverages, infant nutrition, desserts and cheese. Products are both sold business-to-business (B2B), i.e. to food producers and pharmaceuticals, and business-to-consumers (B2C). Currently, it operates in 32 countries, has over 22,000 employees and annual revenue of 11.3 billion euro (FrieslandCampina, n.d.-b). FrieslandCampina is owned by Zuivelcoöperatie FrieslandCampina U.A. that consists of 19,000 member dairy farmers in the Netherlands, Germany and Belgium (FrieslandCampina, n.d.-b). The value chain of FrieslandCampina is illustrated in Figure 6.

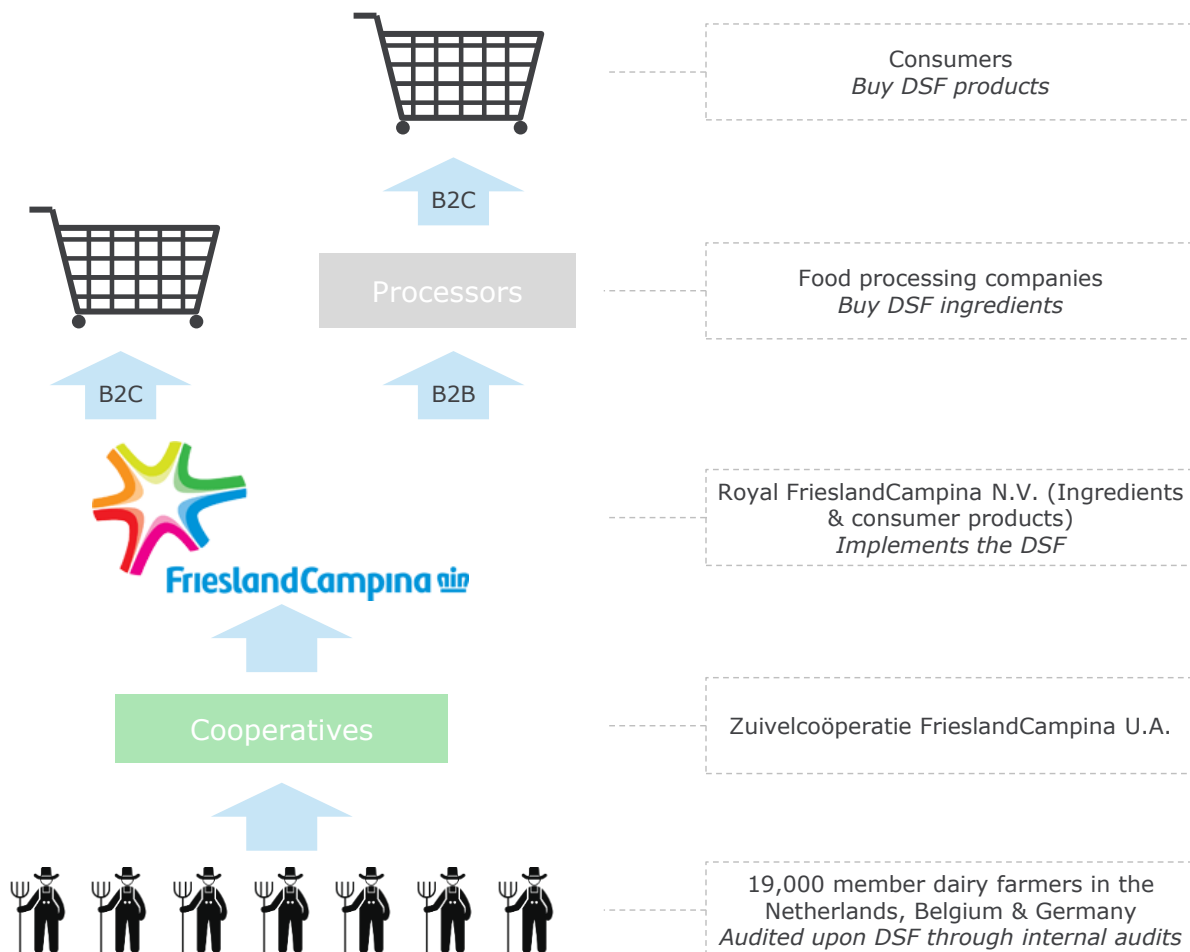


Figure 6. Value chain of FrieslandCampina

Currently, the corporate social responsibility (CSR) policy is formulated within FrieslandCampina's strategy *Route2020* to put sustainability higher on the agenda in their business operations (FrieslandCampina, n.d.-c). Their goals are formulated within four priority areas: Nutrition & health; Dairy development in Asia and Africa; Efficient and sustainable production chains; and, Sustainable dairy farming (in the Netherlands, Belgium and Germany) (FrieslandCampina, n.d.-c). The DSF is part of FrieslandCampina's sustainability strategy and they are currently working on the implementation of this strategy in a pilot by engaging stakeholders, implementing a governance structure and finding endorsement of Marketing and Sales.

The scope of the case study is the DSF pilot by FrieslandCampina. This means that the innovation system consists of FrieslandCampina, its customers, farmers, NGOs, government, banks, research, legislation and other institutions, and the relations between all those. The strategic innovation is DSF as a process approach towards standardization of sustainable dairy production and therefore as a strategy or tool to demonstrate sustainable dairy production. The products coming from this innovation are dairy products produced by a firm that has implemented DSF. And, the user is the

consumer buying a dairy product in a supermarket. The innovation system of the DSF is operating in a broader environment, namely the global dairy sector. In the research, short links will be made with this broader environment, because the innovation system is dependent upon the global development of the DSF as it is a global framework towards standardization of sustainable dairy production and the pilot is a regional implementation of this global DSF.

3.2. Data collection

For the collection of data different techniques were used, known as *data triangulation* to ensure that the data found is rich, valid and reliable (Saunders et al., 2009). These included literature studies using scientific literature on strategic collective system building, innovation systems, market transformation, network governance, communication, grey literature, reports and implementation guides, but also semi-structured interviews and observations.

First, desk research was conducted in order to find background information on the problem. For background information on the implementation of the DSF, CSR reports, implementation guides, and the final report of the DSF were used. Also, an analysis of written sources and literature on credibility, assurance, market transformation, collective system building, innovation, sustainability strategies, and standardization was performed. Next to this, sustainability, standards and sourcing documents were used to understand the approach towards sustainability of other actors in the global value chain.

Semi-structured interviews are suitable for explanatory research as the theoretical framework can help to shape the data collection questions (Saunders et al., 2009). For the interviews, 27 stakeholders were selected, which were all willing to do an interview (see Appendix D for the list of interviewees). The stakeholders were selected upon their relation with FrieslandCampina and could be divided into four categories: FrieslandCampina employees (internal) (11 interviews); value chain stakeholders (5 interviews); external stakeholders (4 interviews); sustainability and certification experts (4 interviews); and comparable cases (3 interviews). The interviewees held positions such as director/Chief Executive Officer (CEO), division manager, key account manager, business developer or marketing manager. 26 of the interviews were face-to-face and one interview was by phone. The interviews consisted of two parts. In the first part, a presentation was given about the DSF and the implementation at FrieslandCampina (see Appendix F) and the interviewees could ask general questions about the DSF and the implementation at FrieslandCampina. In the second part, the interviewees were asked *what credibility of the DSF means to them and what is needed to implement the DSF in a credible manner*. An interview structure helped to structure the interviews (see Appendix G). However, this structure appeared to be more of a guideline, rather than a set line of questioning, because the background of the interviewees were very different in terms of knowledge of the DSF and sustainability in general. The interviews took 60 – 90 minutes and were conducted between June and September 2015. The interviewing of stakeholders was stopped when it was believed that a good understanding of the observed phenomenon was achieved. If requested, transcripts or summaries of the interviews were sent to the interviewees and, subsequently, either accepted or corrected for minor adjustments. Also, the interviews were taken anonymously, meaning that no names or specific job specifications are communicated in the research. The interviews were mostly in Dutch. However, quotes used in this research are translated into English.

In addition to the desk research and interviews, data was collected through observations during the internship period at the central office of FrieslandCampina five days a week. Next to more official meetings, events and farm visits (see Appendix E for a list of observations), also many informal meetings took place. These included lunch meetings, short talks at the coffee corner, in the hallways and in the working area, and have not been recorded or documented.

Also, to increase the validity of the data and to gather lessons-learned, comparable cases, focused on comparable market transformations within the cocoa and coffee sector, were analyzed through interviews, observations and desk research on documentation of the comparable market transformation, the background, approach and implementation. See Table 1 for more explanation of the types of data, the sources and aims.

Table 1. Types of data for the research

Type of data	Stakeholder role	Source	Aim
Desk research		CSR policy, DSF documents with background, approach and implementation guidelines	To get background information on the sustainability strategy of FrieslandCampina and history of the DSF
		Documentation and literature on standards, certification and credibility	To collect background information on ways to go beyond standards and to build credibility
		Sourcing and policy documentation of actors in the GVC	To collect data on the sustainability approach and requirements of actors in the GVC
		Documentation on the comparable market transformations, their backgrounds, approaches and implementations	To find lessons-learned and best practices that can be useful for implementing the DSF at FrieslandCampina in a credible manner
Interviews	Internal	Other DSF pilot working groups, cooperatives, corporate management, account managers, sustainability managers	To collect different views on what building credibility for the DSF means and includes, and in what way they could work with the DSF
	Value chain	Sustainability or supply chain managers of customers and retailers	To collect different views on the requirements for credible sustainable dairy and the implementation of the DSF
	External	NGOs, government, research institutes & banks	To collect different views on the requirements for credible sustainable dairy and the implementation of the DSF
	Sustainability experts	Sustainability consultancy firms, standard experts & certification bodies (accountants)	To discuss about the future of standards and certification. To collect different views on what building credibility for the DSF means and includes.
	Comparable cases	Marketing managers and representatives of the coffee and cocoa sector	To find lessons-learned and best practices for building credibility for the DSF
Observations		Observations made during the thesis internship period at the central office of FrieslandCampina in Amersfoort	To get background information on the business activities at FrieslandCampina, dairy production and processing, and sustainability

3.3. Data analysis

All the interviews were transcribed in Word and analyzed using NVivo. To analyze the data, coding was used “whereby data are broken down into component parts which are given names” (Bryman, 2008, p. 542). Specifically open coding was used, which includes defining concepts that are later grouped and categorized (Bryman, 2008). The concepts of the theoretical framework served as sensitizing concepts (Bryman, 2008). As explanation building is an iterative process (Saunders et al., 2009), the categories of analysis were subject to change. Therefore, next to predefined codes from literature on strategic collective system building and market transformation, concepts derived from the empirical data were added. Activities that were found to be important for strategic collective system building in the dairy sector, but did not exist in the strategy framework yet, were added as new concepts. Also, the cross-case analysis with the comparable cases aimed at the identification of similarities and differences among the sectors with regard to DSF implementation, thereby validating the empirical data of the dairy sector. The coding led to a fragmentation of the data, in which all the fragments could be related to strategic collective system building, market transformation or newly added concepts that could subsequently be analyzed.

The analysis consisted of two parts. To find an answer to the first research question, namely to find how the market transformation of the dairy sector can be described through strategic collective system building, first, the market transformation of the dairy sector was analyzed and described. Subsequently, the market transformation of the dairy sector was explained through the strategic collective system building framework. This framework is applicable to technological innovation, however, was compared to the strategic innovation of the DSF as a process towards standardization of sustainable dairy production. Therefore, the theoretical framework was validated through the dairy sector, as to whether or not similar system building activities were

found in the data. Second, in order to find an answer to the second research question, namely to find how the dairy sector can implement the DSF in a credible manner, the newly added concepts were compared with literature and the existing strategy framework in order to either categorize them within one of the existing strategic collective system building clusters or devote them to a new strategic collective system building cluster. The results are presented in a narrative way.

3.4. Quality of the research

To ensure construct, internal and external validity and reliability, several measures were taken. The research is mainly qualitative and focused mainly on one case study with some illustrations of other sectors, which gives rise to external validity issues. In addition, the interviews were conducted by only one person, leading to internal validity issues. In terms of reliability, an issue would be that the interviews were conducted in confidentiality. This means that names or specific job titles could not be given, which makes it difficult to interview the same people. Also, the interviews were held at a specific moment in the pilot. The pilot is currently developing quite fast, which means opinions or activities needed to create credibility might differ when interviews are conducted in a later point in time.

To overcome these issues, the research made use of triangulation. This means that different sources were used to collect the data, so that the data was rich, valid and reliable (Saunders et al., 2009). Interviews were held with many different stakeholders both within the value chain and external. In addition, observations during the internship enabled to place the research within the broader context of sustainability within the dairy sector. Also, to be able to generalize the case study of the DSF in the dairy sector to the broader food industry or other industries, the case study was continuously compared and related to literature on market transformation, strategic collective system building, continuous improvement and credibility. Moreover, the case study was compared to similar market transformations in the food industry, namely in the cocoa and coffee sector, to find differences and similarities and thereby supporting the evidence and increasing generalizability.

4. Findings

This chapter describes the research findings. Section 4.1 gives the findings on the market transformation of the dairy sector to get a better understanding of the problem and its context. Then, section 4.2 presents the results on the system building activities found in the data. This will lead to an answer to the first research question, namely *how to understand the market transformation of the dairy sector in terms of strategic collective system building?*

4.1. Market transformation of the dairy sector

This section describes the market transformation of the dairy sector. The transformation of the dairy sector is described through the four market transformations defined in the theoretical framework (see section 2.1), namely the *awareness and project phase*, the *first mover and competition phase*, the *critical mass and institutionalization phase* and the *level playing field phase*.

4.1.1. Awareness and project phase of the dairy sector

The international dairy sector is a very diverse sector due to the many regional differences. The International Farm Comparison Network (IFCN) reported that an average dairy farm size in the Netherlands ranged between 82-178 cows, in the USA between 70-5000 cows, in Sudan between 20-117 cows, in Indonesia between 2-10 cows and in Argentina between 170-600 cows in 2014 (IFCN, 2014, p. 7). Meetings with industry experts showed that whereas in many of the developing countries dairy farming has not changed much over the years and is often characterized by smallholders with a low income, dairy farming in the developed countries has seen a development of intensification of milk production and an increase in farm sizes (Global pilots meeting 1, 2; external meeting 2). Also, farm visits 1 and 2 demonstrated that although the milk prices very volatile, FrieslandCampina aims for salaries above minimum standards in the Netherlands. Especially in Europe, with the introduction of the milk quota in 1984 – with the result of forced decrease in milk production and increase in international trade agreements – volatility of the milk price forced farmers to lower the cost price of milk (Reinders & Vernooij, 2013, p. 229). Farmers in the Netherlands bought additional milk quota and took over other small farmers, to stay economically viable (Reinders & Vernooij, 2013, p. 261). Also, with the introduction of new machines farmers were able to intensify and enlarge their farms without an increase in manpower. The introduction of the milk robot in 1992 (Lely, n.d.), for example, made it possible for farmers to let the cows be milked by a robot. In 2010, more than 10% of the Dutch farmers had a milk robot (Reinders & Vernooij, 2013, Chapter 8). This meant that farmers had much less work, which could be spent on other activities, and thereby led to the possibility to increase the numbers of cows at their farms.

However, as society became more aware about the negative environmental impact of the dairy sector (e.g. GHG emissions, eutrophication, biodiversity loss, etc.), laws and regulations came into place in the 90s to reduce the emissions of ammonia, nitrate and phosphate of manure, putting more pressure on the dairy sector (Reinders & Vernooij, 2013, Chapter 8). In addition, both meetings with employees of FrieslandCampina and literature research showed that in the late 20th century and in the beginning of the 21th century, cow diseases such as foot-and-mouth disease and mad cow disease had a major impact on the awareness of the social side of sustainability of the dairy sector (Reinders & Vernooij, 2013, Chapter 8). The pressure to become more sustainable also gained global attention with the publication of the report “Livestock’s Long Shadow” by the Food and Agriculture Organization (FAO) in 2006, as they argued that “the livestock sector emerges as one of the two or three most significant contributors to the most serious environmental problems (..), (including) land degradation, climate change and air pollution, water shortage and water pollution and loss of biodiversity (..) on a massive scale” (FAO, 2006, p. XX).

Discussions with industry experts revealed that, in reaction to the increase in general awareness about the sustainability issues in the dairy sector, large dairy companies introduced various measures to reduce their negative impacts. In the Netherlands, companies introduced measures

to reduce the use of medicines for the cows, to produce energy on the farm, and to reduce greenhouse gas emissions (Reinders & Vernooij, 2013, Chapter 8). Also, the concept of “sustainable” farming systems grew and alternative farming systems, such as integrated farming, biodynamic farming and organic farming, appeared (Calder et al., 2005).

From the observations that awareness on the sustainability issues within the dairy sector grew, after which companies started projects to reduce the environmental impact of their activities, it can be concluded that the dairy sector fully entered the first phase of market transformation, *the awareness and project phase*.

4.1.2. First mover and competition phase of the dairy sector

Observations showed that after the awareness and project phase, dairy companies saw that they could get a competitive advantage with sustainability. In reaction to this, standards appeared. Although the dairy sector is not yet characterized by many sustainability standards, some sustainability standards were developed in the subsequent market transformation phase, the first mover and competition phase. Interviews with account managers of FrieslandCampina showed that, within the Netherlands, dairy products with the meadow milk (Weidemelk) standard (Stichting Weidegang, 2014) gained a competitive advantage by promoting meadow grazing within the Dutch dairy sector, as there is an increased perception that cows are disappearing from the traditional Dutch landscape. In Europe, the market for organic milk increased, with two European Union regulations as standards: 2092/91 and, later, 1804/99 (Rosati & Aumaitre, 2004). Also, other international organizations developed standards and guidelines for organic milk, including the FAO, the International Federation of Organic Agriculture Movements, and the Codex Alimentarius Commission (Rosati & Aumaitre, 2004). Although Grunert et al. (2014) found that in Europe sustainability labels on food products do currently not play a major role in customers’ food choices, meetings with account managers of FrieslandCampina have learned that within business-to-business relations companies in the dairy sector highly compete on sustainability.

Although many actors within the dairy sector have a sustainability strategy and often join a sustainability standard for milk, there are still many sustainability challenges to be tackled due to the intensification and growth of the dairy sector. Also, an internal lecture on sustainable diets (Internal event, 2), supported by literature research, showed that the pressure to become more sustainable from critical stakeholders is increasing as some argue that a plant based diet is a more sustainable diet than an animal based diet (Friends of the Earth, 2015; Health Council of The Netherlands, 2011; Kramer & Blonk, 2015; Sabaté & Soret, 2014). Most interviewees agreed upon the fact that although many initiatives are in place to tackle sustainability within the dairy sector, still much needs to be done in order to fasten the process towards sustainable dairy production.

One way to increase sustainability within the dairy sector could be developing an international standard for sustainable dairy production. However, there is general consensus among the interviewees, with an exception (IV value chain, 2), that the dairy sector should move beyond certification and standards, and should rather take a more collaborative approach that works with international standardization of sustainable dairy production.

The presence of regional differences is one of the arguments found for not implementing a new standard (GDAA, 2015b);(IV internal, 4; IV sustainability expert, 1). The regional differences within the dairy sector are so evident that these stakeholders argued that a new approach for working towards sustainability within the dairy sector should acknowledge and respect these differences, which is often not possible through standards, as they are not dynamic and able to be adapted per region.

One of the comparable cases supported this regional difference argument. Currently, 25% of the coffee is certified for sustainability. However, a representative of the coffee sector acknowledged that it will not be possible to certify all coffee, which means they are currently at a tipping point and question how to move forward (IV comparable case, 3). Although the coffee sector is very familiar with standards, the interviewee emphasized that standards “are not the future”, as they are expensive, not dynamic and cannot be adjusted to regional differences.

With the introduction of sustainability standards in the dairy sector and competition between those standards, the dairy sector moved into the first mover and competition phase, in which also the first arguments appeared against this competition on standards.

4.1.3. Moving beyond competing on standards and towards the critical mass and institutionalization phase of the dairy sector

Sustainability experts argued in the interviews that in order to tackle the sustainability issues in the dairy sector, companies should try to standardize sustainable dairy production (IV sustainability expert, 1, 3). This means trying to align existing initiatives and creating a shared vision and common goals. Especially customers of FrieslandCampina and internal sales interviewees emphasized that collaboration is essential. They argued that the sector as a whole needs to work alike towards sustainable dairy production, not only because this is easier to manage for customers (B2B) as they will be able to benchmark their suppliers, but also because this is best for the sector in becoming more sustainable. It was mentioned that standardization and a credible collaboration is also preferable over competition on standards for banks, as this will reduce the risk of failure of the process towards sustainability (IV external, 3)

Similar arguments are found in comparable sectors. A marketer from a company in the cocoa sector explained that collaboration is important as companies need the objectivity of other organizations in order to be credible (IV comparable case, 1). However, it was stressed that there should be room for competition. Also, both a business developer from a cocoa company and a representative from the coffee sector explained that tackling the urgent sustainability issues within the sectors can only be done collectively (IV comparable case, 2, 3).

It is evident from both the interviews, as well as from observations, that the dairy sector wants to move beyond certifications and standards. Especially for FrieslandCampina, audits at farm level by B2B customers are very costly and time consuming. Once there will be consensus on the way to work towards sustainability, standardization could lead to a reduction of these audits at farm level and a change towards auditing at firm (FrieslandCampina) level. Also, an account manager of FrieslandCampina mentioned that once there is standardization of sustainable dairy production, the late majority or laggards would want to join, because first movers can start the process, after which it is much easier for laggards and the late majority to join (IV internal, 4).

4.1.4. DSF as tool to work towards the critical mass and institutionalization phase of the dairy sector

Although other sustainability initiatives in the dairy sector have tried to work towards a collaborative approach towards sustainability in the dairy sector, like the development of a Roundtable by the World Wide Fund (WWF), from the interviews it is found that the interviewed stakeholders thought the Dairy Sustainability Framework is the solution. An interviewee from the dairy value chain explained that they joined in the pilot for the implementation of the DSF at FrieslandCampina as they thought the right people were joining the discussion and the collaborative approach is useful for the communication and transparency towards consumers (IV value chain, 4). Moreover, one of the main reasons to go through with the DSF, according to the interviewees, was the compatibility of the framework with regional differences. As a sustainability expert argued: "(..) if you take dairy as an industry and think about it in terms of variations of regions, of farm size, terrain and height and so forth, a glass of milk might look and taste the same all over the world, but the variability that lies behind is so great that any standard would have to be of such a super visual level that it would come out to be meaningless. It would be far better not to go down that path at this stage." (IV sustainability expert, 1)

Another sustainability expert said that the development of the DSF started with getting an idea of what the main issues within the dairy sector were, what was already being done on sustainability, what worked and did not work (IV sustainability expert, 2). The DSF was designed for the industry and external stakeholders, including dairy producers and their representatives, processors, customers, multilateral and regulatory authorities, and NGOs (SustainAbility, 2013). Sustainability expert 1 stated that the development of the DSF was an explorative process, as it had to be built

mostly from the sustainability standards experiences of the developers of the DSF. Internal meetings with sustainability experts, meetings with dairy industry experts and sustainability experts showed that the framework builds upon the vision that firms are all climbing the same ladder towards sustainable dairy production; however, actors might be at a different step of the ladder. Therefore, the DSF aims to align existing sustainability initiatives within the dairy sector and works towards standardization of sustainability in the dairy sector. This does mean that the framework makes use of both a global and a regional level of implementation, in which a vision, the sustainability themes and the strategic intents are at a global level and the Continuous Improvement, prioritization, enablers and existing resources are at a regional level (see Figure 2 for a visualization of these activities).

After the introduction of the DSF at the IDF World Dairy Summit in Yokohama, Japan in 2013, FrieslandCampina, Arla Foods and Fonterra developed the Implementation Guide to ensure that dairy companies that are trying to implement the DSF do this in a coherent way. The Implementation Guide suggests the following steps to be taken (GDAA, 2015b):

1. *Orientation towards sustainable dairy*: creating a vision and mission on sustainable dairy production;
2. *Sustainable dairy commitment and policy*: showing your commitment towards sustainable dairy production and including sustainability within your company policies;
3. *Materiality and issue prioritization*: defining which sustainability themes have priority within your region, based on stakeholder dialogue;
4. *Improvement planning*: making improvement plans per sustainability theme;
5. *Executing plans*: executing the improvement plans;
6. *Reporting and communicating*: showing sustainability performance per sustainability theme and communicating these performances publicly;
7. *Continuous improvement*: defining what-if measures and updated targets.

Also, the following enablers of the DSF underpin the steps above and are said to be critical to the implementation of the DSF:

1. Organizational governance
2. Stakeholder engagement

In the pilot by FrieslandCampina these implementation steps are being undertaken. In order to get an idea of how the implementation of the DSF works at firm level, a demonstration scheme has been developed by working group 1 and 2. The demonstration scheme is depicted in Appendix H and aims to demonstrate the implementation of the DSF within firms at regional level.

To ensure continuous credibility of the DSF, implemented at a regional level, the market transformation of the dairy sector from phase 2 to phase 3 needs to be done in such way that it does not fall back to phase 1 or 2; A sustainability expert explained that if the transformation is done right (development of DSF as a collaborative approach towards sustainable dairy production), the dairy sector can move on to phase 3 in which a critical mass collaboratively works towards sustainability. However, if the transformation is done wrong, the dairy sector will fall back to having individual projects on sustainability, which creates less positive economic, social and environmental impact and means no collaboration anymore (IV sustainability expert, 3). Therefore, it is necessary to look at what is needed in order to stimulate and maintain good collaboration between FrieslandCampina and its stakeholders. As stated by another sustainability expert: "you as an industry needed our help to kick-start the process, but now the process is kick-started the industry needs to own it for itself and it should be by the industry, for the industry" (IV sustainability expert, 1).

4.2. Strategic collective system building within the dairy sector

In order to get a smooth market transformation from phase 2 to 3 of moving beyond competing on standards and towards adoption of the sustainability strategy by a critical mass and institutionalization, the collaboration between stakeholders upon implementing DSF must be done in a credible manner. In order to do so, this section focuses on strategic collective system building

activities within the dairy sector. First, section 4.2.1 describes the presence and importance of collaboration through strategic collective system building. Subsequently, in line with the strategic collective system building framework, section 4.2.2 presents and explains the system building activities found through the interviews, document review and observations.

4.2.1. Presence and importance of strategic collective system building in practice

The interviewees were asked *what credibility for the DSF means to them and what is needed in order to implement the DSF in a credible manner*. The analysis of the data revealed that both FrieslandCampina and its stakeholders were aware that they *need to collaborate in order to implement the DSF in a credible manner*. They agreed that this *requires transparency* within the value chain, *alignment of sustainability initiatives* and *commitment*. As an internal interviewee mentioned, this collaboration is partly involuntary as some companies are dependent of each other due to their sustainability targets (IV internal, 4). Also, as stakeholders within the value chain are operating in a competitive environment, collaboration is difficult and often only said in words, rather than in practice (IV internal, 2). However, most of the collaboration is voluntary, as all parties agree upon the fact that owning something collectively will create most positive social, environmental and economic impact. Within the Enablers part of the DSF (see also Figure 2), stakeholder engagement is mentioned as key to build trust in de commitment and activities of the sector. Also, it was mentioned in the final report of the DSF that stakeholder engagement is a growing source of solutions and innovation (SustainAbility, 2013). The implementation guide also states: "Engaging your stakeholders is about having two-way discussions on how best to work together. It is an integral and ongoing part of the activation process and it is not a one-off exercise. (..) In fact this is where the power of the DSF is expressed. (..) It is you and your local stakeholders collaborating and agreeing on the issues, the mitigation programs, the measures of success, reporting and evaluation progress together(..)" (GDAA, 2015b).

All interviewees were aware that collaboration is needed with many different actors. Meetings with the steering and advisory board and the working groups of the FrieslandCampina pilot showed that specifically within the pilot, FrieslandCampina is collaborating with different actors, including government, NGOs, universities, banks, customers, competitors; both directly within the pilot group, but also through other channels. It was mentioned that although stakeholders might have different views on sustainability and the credibility of the DSF, one should always strive to align all the different views (IV external, 4).

4.2.2. System building activities found in the dairy sector

This section presents and explains the system building activities found in the empirical data. The system building activities are presented through their associated strategic collective system building clusters, namely *technology development & optimization*, *socio-cultural changes*, *market creation* and *coordination*. Table 2 gives an overview of the different system building activities found in the empirical data that are in line with the strategic collective system building framework.

Table 2. Overview of system building activities found in the data and in line with strategic collective system building literature

Cluster	System building activity	Stated by the stakeholders	Found in documents	Seen in observations
Technology development & optimization	Testing new technologies, applications and markets			X
	Knowledge development	X ^a		X
	Knowledge exchange	X	X	X
	Development of commercially viable products			
	Co-creation of products and services			
Socio-cultural changes	Feedback loops with user-groups			X
	Creating new facilitating organizations			
	Establishing collaboration-prone organizational cultures			X
	Change user behavior	X		X
	Changing the education system			
Market creation	Generation of a skilled pool of labor			
	Generate new business models			
	Creation of temporarily protected niche market			
	Collaboration with government for enabling legislation	X		X
	Collaborative marketing to raise user awareness			X
Coordination	Collaborative competition against other technology clusters			O ^b
	System orchestration	X		X
	Creating a shared vision	X	X	X
	Defining a common goal	X	X	X
	Standardization of the new technology	X	X	X
	Providing a platform for open innovation		O	
	Thinking in system building roles	X		X
	Creating transparency of all activities going on in the field	O	O	O

^a "X" indicates that the definition of the system building activity as described by Planko et al. (2015) is in line with the findings

^b "O" indicates that the definition of the system building activity as described by Planko et al. (2015) is *not* in line with the findings, but found through a different definition

4.2.2.1. Technology development & optimization

As for the cluster *Technology development & optimization*, a dairy value chain interviewee recognized that it is "maybe necessary to review the process (of demonstrating sustainable dairy production) itself and to get the feedback from (...) the field and to see if we should adapt (it)" (IV value chain, 1). However, others argue that not the DSF in general needs to be developed, but rather the implementation within firms in terms of continuous improvement. Though, it is found that there is constant *knowledge development* within the pilot, which is crucial for the credibility of the DSF. Meetings with the advisory and steering board of the pilot, interviews with the stakeholders, meetings with external consultants, collaboration with university, but also NGO consultation all lead to the development of new knowledge that, subsequently, leads to the optimization of the DSF. In line with continuous improvement, this means that the DSF continuously needs to be updated according to new findings and trends within the dairy sector.

Through the meetings with the steering and advisory board of the pilot, also *knowledge exchange* is taking place. Working groups from the pilot showed the results of their research and subsequently received feedback from the advisory and steering board. Also, the World Dairy Summit, a yearly global conference on dairy developments, contributes to the exchange of knowledge on sustainability within the dairy sector. Likewise, the final report of the DSF states: “the Framework is designed to enable dairy industry stakeholders to (..) share good practice and innovations among regions and throughout the value chain” (SustainAbility, 2013, p. 9). Knowledge exchange was also mentioned by one of the interviewees as to introduce training to members of the DSF to embark them (IV value chain, 1). Also, the implementation guide is a perfect example of exchanging knowledge on the implementation of the DSF.

To compare, knowledge exchange is also found in the comparable case of coffee. A representative of the coffee sector explained that in the coffee sector actors exchange best practices and business cases through open sources and conferences (IV comparable case, 3).

The system-building activity *testing new technologies, applications and markets* was not specifically mentioned by the interviewees. However, meetings with the other global DSF pilots showed that this activity does take place and contributes to the development of the DSF (Global pilots meeting, 1, 2). The five pilots that are currently taking place worldwide have the objective to find out how the DSF can be applied to that specific region and what we can learn from that, thereby testing the DSF at a specific market or application. Also within the FrieslandCampina pilot, one of the questions raised is how to use the DSF within external communication? How can we use it for different applications? These questions will be answered within the coming years by the pilot members and global DSF governance board and might contribute to the development and optimization of the DSF.

Although not specifically found in the interviews, *feedback loops with user-groups* take place through the meetings with the advisory and steering board. They test and give feedback to the working groups of the pilot on whether the direction they are moving in is the right one and also applicable and credible to them. Although working group 3 is working on marketing and sales of the DSF, *consumer* feedback loops are currently not taking place.

4.2.2.2. Socio-cultural changes

System building activities in the *socio-cultural changes* cluster were not often mentioned by interviewees or found in documents and observations. The activity of *changing user behavior* is the only activity mentioned by the interviewees and most often found in observations. As explained within the market transformation of the dairy sector, sustainability labels on food products do not seem to play a major role in customers’ food choices in Europe (Grunert et al., 2014). However, earlier research has shown that Dutch consumers increasingly buy sustainable food; consumer expenditures on sustainable food products increased with 18% from 2013 to 2014 (Logatcheva, 2015). For dairy specifically, consumers spend 31% more money on sustainable dairy products in 2014 compared to 2013 (Logatcheva, 2015). Meetings with marketing employees showed that it is difficult for companies to communicate corporate sustainability initiatives through their products, as many consumers are not aware of labels or sustainability issues of a product. Although interviewees argued that FrieslandCampina could try to change user behavior into a more sustainable consumption behavior, it was questioned whether DSF as a framework would be suitable for consumer communication (IV internal, 3, 6, 7). Through meetings with representatives of FrieslandCampina and an interview with a customer, it was found that sustainability might be the new food safety and quality, which means that consumers might in the future rely on the retailer to make sure their food is sustainable, just as food in a supermarket is assured to be safe and of good quality. Although consumers play a large role in the sustainability of food, it was questioned as to whether consumers will change their behavior or producers and retailers will have to change the availability of sustainable food products.

Another system building activity found in the pilot is *establishing collaboration-prone organization cultures*. Through the pilot, FrieslandCampina tries to open up about sustainability within the dairy sector. Reducing the audits at farm level requires trust from its customers so that they accept not

to check farmers, but rather to check FrieslandCampina upon their implementation of the DSF. In order to reach this stage, collaboration-prone organization cultures are needed, as all parties will need to create transparency and work together on the development and implementation of the DSF.

4.2.2.3. Market creation

Market creation appeared to be a well-debated cluster. One of the first questions to be raised by a dairy value chain interviewee was: "Is it the idea that sustainable dairy is something really different or are you going to make the dairy sector more sustainable, which is making it future-proof?" (IV value chain, 5) Interviewees also argued that sustainability might eventually become a 'license to operate'. However, from meetings with a project manager on the financial value of sustainability it is found that sustainability should and could lead to value creation, whether this is by an increased market share, new market entries, pricing power, cost saving or brand reputation. Most interviewees recognize that the DSF has great potential in demonstrating sustainable dairy production within FrieslandCampina, however, also stress that individual companies should be able to compete and distinguish themselves from other dairy companies.

The system building activity most discussed within the market creation cluster *is collaboration with government for enabling legislation*. The government is identified as a key stakeholder within the pilot. However, interviewees had different opinions as to whether or not government is stimulating change fast enough. An interviewee argued that legislation often does not bring enough change; the dairy sector is making the first steps, government follows (IV external, 2). Another interviewee argued that companies do not put the interests of the environment and society first, they only start action because of legislation (IV internal, 3). Some argue that legislation could help to set minimum standards. This is also what is applied in the pilot; minimum standards in the demonstration scheme include legislation (Dutch and EU for the FrieslandCampina pilot) (see also Appendix H). The demonstration scheme recommends for all regional implementations to check the applicable laws and regulations for that particular region and implement them as minimum standards. For the interviewed stakeholders within the pilot, minimum standards were crucial to the credibility of the DSF.

To compare, within the coffee sector it appeared that collaboration with government was key to implement sustainability initiatives, as government helped organizing training workshops with local farmers (IV comparable case, 3).

One of the activities discussed, but probably too ambitious at the moment according to marketing employees and account managers, is *collaborative marketing to raise user awareness*. Meetings with working group 3, which is working on marketing and sales for DSF, showed that collaborative marketing could have a great impact on consumer awareness. However, this also makes partners more dependent on each other, which could create resistance. This activity is therefore currently not taking place within the pilot. However, this activity might be beneficial in the future according to working group 3, because other sectors are using this type of marketing already.

To compare, an interview with a representative of the cocoa sector (IV comparable case, 1) showed that some collaborative marketing takes place in the cocoa sector. Suppliers provide stories about cocoa farmers and sustainability initiatives that customers can use for marketing towards their consumers.

Through the collaboration FrieslandCampina has with its stakeholders on the implementation of the DSF, it creates endorsement of the DSF. Most interviewees thought that DSF is the right framework for the implementation and demonstration of sustainable dairy production. This makes it more difficult for other sustainability initiatives in the dairy sector to compete against the DSF. The DSF therefore does not actively compete against other initiatives, but has a more passive approach. Hence, the system building activity *collaborative competition against other technology clusters* is not found in the data.

4.2.2.4. Coordination

Coordination appeared to be the most-discussed strategic collective system building cluster in the interviews, observations, and documents. All interviews showed that coordination not only fastens the process, but also that it is essential for strategic collective system building in the pilot. All coordination activities are found within the case study.

Although not often stated by the interviewees, *system orchestration* was described as one of the activities needed to collaborate within the value chain of the dairy sector (IV external, 4; IV sustainability expert, 3). System orchestration was described as aligning the initiatives of actors within the value chain. This means starting a discussion on the requirements and intentions of different initiatives, and subsequently, if gaps exist, filling these gaps. Meetings with the steering and advisory board of the pilot supported these findings. The final report of the DSF also argued that “the Framework seeks to bring greater coherence across the differences within the global dairy sector” (SustainAbility, 2013, p. 9).

Comparable cases also showed standardization activities. Through CocoaAction, a collaboration between 11 large cocoa brands, companies try to align their sustainability initiatives so that they are all moving into the same direction towards sustainability (IV comparable case, 1).

The system building activity *creating a shared vision* was mentioned frequently in documents (GDAA, 2015b; SustainAbility, 2013) and in some of the interviews (IV external, 2; IV value chain, 5; IV sustainability expert, 3). The DSF has a global vision, which has been developed by SustainAbility through the review of several vision statements published by regional dairy stakeholders and existing global initiatives. Subsequently, consultation with the governance group and technical working group of the DSF development by SustainAbility took place (SustainAbility, 2013). According to SustainAbility: “a vision statement can help drive a cohesive approach towards achieving and demonstrating sustainable practices. It enables external stakeholders to put current performance trends in context and to assess the extent and depth of the sector’s commitment to sustainability, providing a way for sector stakeholders to build agreement” (2013, p. 20). It has been found that a global vision, agreed upon by all stakeholders, is important to define where the sector wants to move towards. Although the global DSF vision is defined in the final report by SustainAbility, they explain that this vision will most probably evolve over time and that it is important for the dairy sector to receive feedback upon this vision with an open spirit.

Especially the interviewed external stakeholders expressed the need for *defining a common goal*. This need is also found through documents (GDAA, 2015b; SustainAbility, 2013). According to an interviewee from the dairy value chain, the goals one sets are crucial for the level of credibility (IV value chain, 5). Therefore, defining a common goal appears to be important for strategic collective system building. The global DSF does have strategic intents per sustainability issues (see also Appendix B). However, these are intended to function as an ambition, similar to the function of a global vision, and can therefore not be seen as global goals. However, at firm level, goals need to be defined (GDAA, 2015b). Observations (e.g. lunch meetings with representatives of FrieslandCampina and meetings with industry experts) showed that communication of goals is key for credibility, as this creates transparency and shows commitment. As for global goals, one of the sustainability experts explained that recent insights have found that if there are no objectives, the sector will fall down to phase 1 or 2 in the market transformation (IV sustainability expert, 3). Also, a sustainability expert said: “Should we put public targets out in the public domain? We think yes.” (IV sustainability expert, 1) However, meetings with international sector experts showed that it might currently be too early to define common global goals. Also, defining global key performance indicators (KPIs) for the monitoring of performance towards the global goals is difficult, as all regions/firms are using different KPIs due to the regional/firm implementation and prioritization.

Standardization of the new technology is the very fundamental part of the DSF. Although the DSF is not trying to become a standard, it does try to standardize sustainable dairy production. The DSF provides a global framework for sustainable dairy production that can be regionally applied, thereby standardizing the ‘way of working’ and creating a ‘common language’. The purpose of the

DSF, as stated in the final report of the DSF, is “to develop consistent ambitions and activities to meet sustainability needs” (SustainAbility, 2013, p. 9). Pilot meetings with the steering and advisory board and interviews showed that there is general believe that creating this common language within the dairy sector is very useful and also fits the current sustainability status of the sector.

Although not specifically mentioned within the interviews and observations, the system building activity *providing a platform for open innovation* is touched upon through the purpose of the DSF, as described in the final report, namely “to share good practice and innovations among regions and throughout the value chain” (SustainAbility, 2013, p. 9). However, it can be discussed whether this purpose is part of knowledge exchange instead.

Thinking in system building roles appeared to be a very important activity within coordination. Although not mentioned in documents, many of the interviewees (IV value chain, 2, 3, 4, 5; IV internal, 2, 5; IV sustainability expert, 3) touched upon the different roles that stakeholders have within strategic collective system building in the dairy sector and specifically in the FrieslandCampina pilot. It was mentioned that within a firm’s stakeholder group, there are differences between stakeholders that the firm needs to have consensus with, and stakeholders that have a more advisory role and with whom there is no need to have a shared vision (IV value chain, 5). Also, an interviewee argued that FrieslandCampina, as a large global dairy company, should take a leading role in the market transformation (IV internal, 5). However, it was also stated that all stakeholders have a specific role and are accountable for a specific part, including customers of FrieslandCampina, government and NGOs (IV value chain, 3; IV sustainability expert, 3).

Transparency has been mentioned many times by the interviewees. Interviewees argued that activities like minimum standards, monitoring, reporting, verification and traceability would lead to transparency of the activities going on in the field. The *transparency of all activities going on in the field* (or at the firm) helps to increase the credibility of the implementation of the DSF, according to many of the interviewees. Document review found similar activities to contribute to transparency (GDAA, 2015b; SustainAbility, 2013).

To conclude, the findings showed which of the system building activities described within the strategic collective system building framework are present in the dairy sector and specifically within the case study of FrieslandCampina implementing the DSF. As can be seen in Table 2, 16 of the 23 system building activities are found in the case study data. Hence, most of the system building activities appear to be important for the implementation of the strategic innovation DSF. However, additional system building activities seem to be relevant for the dairy sector, which will be discussed in the following section.

5. Analysis

From the findings it can be concluded that the strategic collective system building framework partly supports the implementation of the DSF. But, empirical findings showed that next to the existing system building activities, other, new system building activities take place and are important in the dairy sector. Some of the new activities appear to be part of the existing activities described by Planko et al. (2015). However, others seem to be additional or even overarching activities or clusters. First, section 5.1 describes the newly found system building activities. Subsequently, section 5.2 discusses the influence of these new activities on the strategic collective system building framework.

5.1. Additional system building activities that contribute to the credible implementation of the DSF

5.1.1. Attitudinal and instrumental commitment as preconditions for strategic collective system building

As cited in the Dairy Sustainability Framework Implementation Guide: "it is crucial that management within your organization agrees and commits to sustainability in order to successfully implement the DSF. Management plays a key role in making decisions on strategic direction, planning, policy and standards, resource availability, culture change and budget. These are all important parts of embedding sustainability within an organization" (GDAA, 2015b, p. 12). Moreover, interviews with both internal and external stakeholders revealed that commitment from all stakeholders is crucial to the credibility of the implementation of DSF. The right commitment to the shared vision and goals, continuous improvement and collaboration were mentioned as important to the successful implementation of DSF and the credibility of the DSF towards customers (IV sustainability expert, 3; IV value chain, 5; IV external, 4; IV internal, 2).

Commitment also appeared to be important in one of the comparable cases. An interview with a representative of the coffee sector showed that companies felt ownership due to financial investments and commitment was shown through visiting conferences and sharing best practices and business cases (IV comparable case, 3).

Commitment, together with trust and communication, is also seen as critical for network relationships or strategic alliances according to literature (Batt & Purchase, 2004; Blomqvist & Levy, 2006; Cullen, Johnson, & Sakano, 2000). Blomqvist and Levy (2006) make a distinction between instrumental and emotional commitment. Emotional commitment relates to the fact that "the relationship provides status and meaning, and enhances the actors' willingness to nurture and care for it" (Blomqvist & Levy, 2006, p. 40). Emotional commitment can also be defined as attitudinal commitment, namely "giving extra effort to make the venture work and a willingness to go beyond mere contractual obligations" (Cullen et al., 2000, p. 226), which seems to be more business focused and therefore better applicable to the implementation of DSF. Instrumental commitment is visible through tangible actions and material investments in the relationship (Cullen et al., 2000).

Although commitment does not seem to fall under one of the four strategic collective system building clusters as defined by Planko et al. (2015), it can be argued from both empirical data in the dairy sector and the literature research that commitment is a precondition to successful collaboration in a network. Attitudinal and instrumental commitment are thought to include willingness, tangible actions and investments. Therefore, both attitudinal and instrumental commitment are suggested as underlying preconditions for strategic collective system building.

5.1.2. Governance as a more formal description of coordination

Another new finding from the empirical data in the dairy sector is the importance of a good governance structure for the credibility of the DSF. Governance structure, both at a regional and global level, appeared to be key for the right implementation and development of DSF. As the final report of the DSF describes: "A well-designed governance system will be critical to ensuring the

Framework is developed and refined over time” (SustainAbility, 2013, p. 34). According to interviewees, governance should comprise what-if measures with a time-frame and objective stakeholders (IV external, 2, 3; IV internal, 6; IV sustainability expert, 4). SustainAbility also recommended that “for the governance to be credible, it must comprise sufficiently broad representation, incorporating accountability mechanisms to ensure progress in meeting sustainability objectives. To achieve inclusiveness and ownership, all those participating in the governance of the Framework must agree on a common approach, to avoid the impression that this is a process established and imposed by others” (SustainAbility, 2013, p. 34). This recommendation was given for the global governance of the DSF. SustainAbility also explained that to meet these needs, the following criteria should be met (SustainAbility, 2013):

- Legitimate: Representative of the whole sector and its stakeholders, transparent and inclusive;
- Strategic: Focus on long-term and most important direction;
- Decisive: Clear on who decides what, where and how;
- Performance-oriented: Focus on sustainability and nutrition outcomes and contributions, the framework and governance performance, and able to evaluate and respond;
- Capable: Members with appropriate skills, experience and capacity, supported with necessary resources;
- Affordable: fit for purpose and financially sustainable.

SustainAbility acknowledged that the governance of the DSF is still under development; although the dairy sector is seen as proactive in its approach towards sustainability, the governance should still be developed further.

Similar to other activities, empirical data in the dairy sector found arguments both for a global governance structure, as well as for a regional governance structure. An interviewee supported the idea that a global governance group has a more supportive role (IV value chain, 1). A regional governance group would have much more responsibility towards performance outcomes (IV external, 2; IV internal, 6). It has been argued by an interviewed value chain stakeholder that the system (or collaboration) should be driving itself with business and commercial relationships (IV value chain, 1). This is also found through meetings with the pilot members. A global DSF governance group could then review the process in general, get feedback from the firms implementing the DSF and coordinate the development of the DSF (IV value chain, 1). Also, a global governance group could communicate about the DSF and supply training material for new members.

Interviewees also raised concerns about the power of a governance group to force non-complying companies to take what-if measures (IV internal, 1, 2). For the regional implementation of a sustainable dairy approach, the Implementation Guide also argues that “it is essential to have a good governance structure from the outset” and that “when working together in a regional approach, it is also advisable that a steering group be formed, including high-level representatives from milk producers, and dairy processors, to support the full process and provide steering possibilities” (GDAA, 2015b, p. 9).

Support for the argument to have a good governance structure is also found in the comparable case of the coffee sector. Global governance is crucial for successful market transformation through collaboration in the coffee sector. A sustainability expert explained that a global governance group (or sector-wide body) constantly manages the minimum standards and reviews the vision of the sustainability initiative (IV sustainability expert, 3).

Within the strategic collective system building framework, coordination, being defined as “coordinate and align all individual and collective system building efforts, to bundle forces and use resources efficiently” (Planko et al., 2015, p. 12), is used as a cluster for the organization and alignment of the system building activities. However, as found in the data on the credible implementation of the DSF in the dairy sector, governance might be a better alternative for describing organization and alignment. As Kenis and Provan describe in their article on network governance: “some form of governance is necessary to ensure that participants engage in collective and mutually supportive action, that conflict is addressed, and that network resources

are acquired and utilized efficiently and effectively" (2007, p. 231). Through a comparison of the two definitions given here, it can be concluded that the difference between coordination and governance seems to be that the latter includes *addressing conflict* and *acquiring of resources*. It is therefore suggested to include these two subjects into the definition of governance. This means that the definition of governance would change into: *Coordinate and align all individual and collective system building efforts, to bundle forces, acquire and use resources efficiently and address conflict*.

Yet, it is important to note here that there is a difference between formal and informal mechanisms of coordination. Whereas formal mechanisms can include control and reporting systems, including command structures, incentive systems, standard operating procedures and documented dispute resolution procedures, informal mechanisms are much more focused on relations, including norms, conventions, cultures and social bonds (Alvarez, Pilbeam, & Wilding, 2010). As the interviewees mentioned that governance would include what-if measures, control of performance and reporting, it is suggested that some forms of formal mechanisms would be required for the credible implementation of the DSF. This is in line with the argument that "the choice is not often between one mechanism or another, but rather between one particular set of mechanisms and another alternative combination to govern the interactions among the organisations in a network" (Alvarez et al., 2010, p. 167).

In conclusion, it can be argued that the use of governance as a cluster seems to be more comprehensive than the use of coordination as a cluster and that it includes activities that are thought to be essential for the credible implementation of DSF at FrieslandCampina. Governance could include more formal mechanisms of coordination to better organize and align the system building activities. Therefore, in line with the empirical findings, it is proposed to make some refinements of the activities within the coordination cluster, so that they are better aligned with the inclusion of formal mechanisms of coordination. These refinements comprise of the inclusion of *levels of maturity of sustainability performance and implementation for standardization* (though these are case specific), the inclusion of *minimum standards, monitoring, reporting, verification and traceability in creating transparency of all activities going on in the field*, and the additional activity *communication*. The subsequent sections describe the suggested additional activities.

5.1.3. Levels of maturity of sustainability performance and implementation within standardization

As described in the results, *standardization of the new technology* is important for credible implementation of the DSF and leads to the creation of a 'common language' for sustainable dairy production. However, data also revealed that an additional activity contributes to the standardization of sustainable dairy production. This activity or requirement is *defining levels of maturity of sustainability performance and implementation* and is thought to be a more formal mechanism of control.

One of the findings from meetings with the steering and advisory board of the pilot and interviews with customers is the need for levels of maturity in terms of performance and implementation of DSF for the credibility of the DSF. Levels are needed as companies may want to differentiate themselves from others for a competitive advantage. One of the sentences often heard in both interviews and from sustainability experts is: "We are all climbing the same ladder, but we are just at a different step". Steps need to be defined in order to be able to differentiate from competitors. Also, an interviewee argued that with defining levels of maturity, it is easier to make a claim about sustainable dairy production (IV external, 3).

Levels of maturity in terms of implementation of corporate sustainability strategies are described within sustainability literature (Baumgartner & Ebner, 2010). Literature on levels of maturity has not been found within the technological innovation literature, though literature on co-opetition has showed that through both collaborating and competing with partner firms on a technological innovation, partners "can access the knowledge and resources of partners and share the risks and costs, (though) competitor partners benchmark each other and prepare for the consequences of

competition" (Gnyawali & Park, 2011, p. 658). This research shows that although firms are collaborating, it is still important to differentiate oneself from the other by benchmarking, which could in turn be done through levels of maturity of sustainability performance and implementation. Levels of maturity have not been found within the comparable cases.

To refine the strategic collective system building framework, it is suggested to add a way in which *standardization of the new technology* could be obtained, namely through *the inclusion of levels of maturity of sustainability performance and implementation*. Therefore, it is suggested to change standardization, into *standardization of the new technology (e.g. through including levels of maturity of sustainability performance and implementation)*.

5.1.4. Minimum standards, monitoring and reporting, verification, and traceability to increase transparency

As found in the findings section, interviewees argued that transparency contributes to the credibility of and trust in the DSF. Interviewees mentioned several activities that lead to transparency, including *inclusion of minimum standards, monitoring and reporting of the sustainability performance, verification of the sustainability performance, and traceability of the products*. However, this definition is different from the definition by Planko et al. (2015), as Planko et al. argue that transparency reduces overlap and avoids the depletion of resources.

5.1.4.1. Minimum standards

Pilot meetings and interviews with both sustainability experts, external stakeholders and customers showed that in order for DSF to be credible and transparent, it should include minimum standards. Arguments have been found for both minimum standards at a global level (IV external, 4; IV value chain, 5; IV sustainability expert, 4), as well as at a regional/firm level (IV value chain, 4; IV internal, 3). According to these interviewees, globally some minimum standards should apply, for example, regarding corruption, human rights, deforestation and bribery. However, regionally, companies should comply with legal requirements and sector agreements. FrieslandCampina has put additional minimum standards on their farmers, to move beyond legal requirements (FrieslandCampina, n.d.-a). To decide what minimum standards apply to a specific region or firm, interviewees argue that stakeholders should be engaged (IV value chain, 3, 4). Comparable cases also showed that minimum standards are required within the cocoa and coffee sectors through sustainability standards.

Literature on transparency has distinguished between horizontal and vertical transparency in food supply chains (Kalfagianni, 2006). Horizontal transparency is thought to include requirements and legislation that apply to companies in the different stages of the supply chain and vertical transparency is thought to include requirements and legislation that apply to all companies in a specific supply chain (Wognum, Bremmers, Trienekens, van der Vorst, & Bloemhof, 2011). From this literature it is evident that minimum standards or requirements are part of transparency within food supply chains.

From the empirical data, comparable cases and literature it can be concluded that minimum standards are a way of creating transparency. Therefore, it is suggested to add *the inclusion of minimum standards* as a way to create transparency in the strategic collective system building framework.

5.1.4.2. Monitoring and reporting of the sustainability performance

DSF as a global framework acknowledges that as it has a different approach than other commodity sustainability programs, it needs to ensure that "there is an appropriate level of robustness within its delivery process to comfort those who have an interest in the sustainability performance of the dairy value chain" (GDAA, 2015b, p. 7). Therefore, DSF globally is setting up a monitoring model to collect information about the implementation of the DSF and the performance of individual initiatives. Through this monitoring system, DSF can quantify the performance of the whole sector and will be able to report the performance. The need for a global monitoring and reporting system is supported by one of the interviewees, who argued that a global monitoring and reporting system

adds to the credibility of the DSF (IV value chain, 5). This finding is also evident from comparable cases. Although the coffee sector is still searching for appropriate metrics and reporting mechanisms, the cocoa sector has just introduced global KPIs and also reports on those (IV comparable case, 1, 3).

However, for customers, but also for other stakeholders, a monitoring and reporting system at regional level seems to be much more relevant (IV internal, 4; IV value chain, 3; IV sustainability expert, 2, 3). One of the internal interviewees argued that stakeholder engagement is crucial for getting trust and that to get the engagement of stakeholders one should monitor, report and evaluate these performances (IV internal, 4). DSF also recommends individual companies to report regularly on the sustainability performances, because this also shows commitment (GDAA, 2015b; SustainAbility, 2013). A sustainability expert argued that honest reporting is key: "Reporting without being able to compare over time or there have been adjustments to the targets, but there is no explanation of why? That, for me, undermines credibility" (IV sustainability expert, 2).

Monitoring and reporting is also found in literature on transparency. Wognum et al. (2011) argue that "the horizontal dimension (of transparency) also includes information provision of each company in a particular stage to relevant stakeholders and consumers concerning their policies and measures", and explain that corporate reporting could be a way to do this.

From the empirical findings, comparable cases and literature it can be argued to include monitoring and reporting as a way to create transparency. Therefore, it is suggested to add *the inclusion of monitoring and reporting* to the system building activity of *creating transparency of all the activities going on in the field* in the strategic collective system building framework.

5.1.4.3. Verification of the sustainability performance

To fully secure transparency of the implementation of DSF, most interviewees argue that verification by an objective party, like an accountancy or assurance firm is needed. Interviewees note that verification is mainly necessary for B2B customers and NGOs, to make it credible (IV external, 2; IV internal, 7; IV external, 4). Meetings with sustainability managers and experts showed that certification is a very expensive way to secure transparency. Most interviewees, except NGOs, argue that third party certification, including audits at farm level, is not necessary needed, but that instead objective verification is needed on the implementation process and performances. Literature on transparency mainly focuses on verification of sustainability reports (Kolk, 2004; Perego & Kolk, 2012), which is slightly different from the type of verification needed for the DSF as the verification of sustainability reports are being done on the performance and measurement of the performance, and not on the implementation of sustainability.

Verification or certification is also found within the comparable cases. Within the comparable cases, however, certification of existing standards occurred and does therefore not include a continuous improvement or process approach towards sustainability.

Although the verification of the sustainability performance seems to be a relatively formal way of coordination, empirical data showed that it should be part of creating transparency. Therefore, it is suggested to add *the inclusion of verification* to the system building activity of *creating transparency of all the activities going on in the field* in the strategic collective system building framework.

5.1.4.4. Traceability of the products

The analysis of the interviews showed that traceability creates more transparency within the dairy sector (IV internal, 5; IV sustainability expert, 2; IV external, 3). An interviewee argued that for a customer it is important to be able to know where a certain product or product batch comes from so that they know whether or not this product or product batch was produced by a firm that implemented the DSF (IV internal, 5). Analysis of comparable cases showed that sustainability strategies were credible due to their transparency. Interviewees mentioned that The Forest Trust and the stars system for animal welfare in the Netherlands, called Beter Leven Keurmerk, are credible sustainability standards due to, amongst others, their traceability (IV external, 2; IV value chain, 1). Also, it was mentioned that the Round Table for Sustainable Palm Oil (RSPO) was less

credible due to the fact that certificates were difficult to trace, as they are being sold on a market and not directly linked to products (IV value chain, 1). From these findings it can be argued that traceability is needed in order to create transparency.

Literature research showed similar results. Wognum et al. (2011) argue that traceability is part of vertical transparency as it facilitates following a product and the processes it went through up and down the value chain. Kalfagianni also argued that “a high degree of transparency in the vertical dimension is important in order to ensure the accurate and rapid identification of product and process information” (Kalfagianni, 2006, p. 19). She also explained that a system of traceability is part of horizontal transparency, as this gives information on all sustainability attributes of products and processes. Within Europe, traceability is even compulsory for food products under the General Food Law (Wognum et al., 2011).

From the empirical data, comparable cases and literature it can be concluded that traceability of the products creates transparency. Therefore, it is suggested to add *traceability of the product* as a means to create transparency in the strategic collective system building framework.

In conclusion it can be argued that the activity of *creating transparency of all the activities going on in the field* should include the findings from empirical data in the dairy sector. Therefore, the activity should be rephrased into *creating transparency of all the activities going on in the field through minimum standards, monitoring, reporting, verification and traceability*. This is a refinement of the strategic collective system building framework, as Planko et al. (2015) did not define what is needed to create transparency.

5.1.5. Communication as a means for governance

One of the activities often mentioned in the interviews is communication or the communication of the vision, goals, performance and the DSF and sustainability in general (IV internal, 4, 7, 10; IV sustainability expert, 4). The empirical findings showed that communication does not seem to be a standalone activity, but is rather integrated within all the activities captured through coordination. The importance of communication is also stressed in the Implementation Guide. It states that companies “can communicate (their) progress and success to a large group of producers via newsletters, farmers’ and processors magazines and well-chosen written materials” (GDAA, 2015b, p. 14). Also, the final report of the DSF states that the DSF in general serves as a communication tool towards industry and external stakeholders (SustainAbility, 2013). As for communication of the DSF in general and extensive reports, interviewees argue that this is only suitable for B2B communication. Communication to consumers is thought to be difficult and often only includes the communication about separate sustainability themes and examples (IV internal, 3, 6, 7). This is also found within the comparable case of cocoa (IV comparable case, 1). Also, communication towards consumers is strongly related to marketing and does therefore not apply to the coordination cluster.

Communication as a means to contribute to system building is also described in literature by Leeuwis and Aarts (2011). They argued that “everyday communication among stakeholders is of critical importance for the reordering of social relationships and the emergence of space for change in networks” (Leeuwis & Aarts, 2011, p. 10). They gave several examples of possible communication strategies for enhancing the basic processes relevant to innovation support based on literature research, including mobilizing pressures from outside to enhance feelings of interdependence, working towards ‘coalitions of the willing’ and excluding actors who do not feel interdependent, demonstrating and visualizing interdependencies among stakeholder practices, and steering collaborative research activities to questions relevant to less resourceful stakeholders (Leeuwis & Aarts, 2011, p. 8).

Planko et al. defined coordination as: “Coordinate and align all individual and collective system building efforts, to bundle forces and use resources efficiently” (2015, p. 12). However, it is suggested that this definition would include communication. This means that the definition, after the conversion of coordination into governance, would change into: *Coordinate, align and*

communicate all individual and collective system building efforts, to bundle forces, acquire and use resources efficiently and address conflict.

5.1.6. Endorsement of stakeholders to secure their participation in strategic collective system building

Related to correct stakeholder engagement and the inclusion of all relevant stakeholders in the innovation system of the implementation of DSF at FrieslandCampina, is the need for endorsement of the DSF of NGOs, government and science. Especially consumer-related interviewees mentioned that the endorsement of NGOs is important for the credibility of the DSF (IV value chain, 1, 4; IV internal, 4). It has been argued that NGOs are seen as objective parties that are well-suited to make a judgement upon whether or not the DSF is appropriate for addressing sustainability within the dairy sector and whether the DSF has been implemented in a correct way within firms. A similar argument has been found for endorsement of government and science (IV internal, 8, 10). Especially scientific researchers are, according to one of the interviewees, able to judge whether or not certain performances are ambitious or in line with research on climate change and accountability (IV internal, 10).

5.2. Validation and refinement of the strategic collective system building framework based on the implementation of the DSF in the dairy sector

As indicated by Planko et al. (2015), the development of the strategic collective system building framework was based on a single case study and extensive literature research, which means that it could not yet be considered a comprehensive strategy framework yet. They argued that validation of the framework for other fields is needed in order to further develop the framework. Through the empirical findings of this research a first attempt was made to validate the framework. Section 5.2.1 gives a short recap of this validation. However, as described, new activities are found in this research. Based on these findings a refined version of the strategic collective system building framework is proposed (see Figure 7) and discussed in section 5.2.2.

5.2.1. Validation of the existing system building activities

After the validation phase of the research of Planko et al. (2015), they argued that the focus of the strategic collective system building framework might be different for other industries. The empirical findings of this case study in the dairy sector confirmed this assumption. As can be seen in Table 2 framework., not all system building activities have been found in the case study of FrieslandCampina implementing the DSF in the dairy sector and in the comparable cases of the cocoa and coffee sector that are also moving from phase 2 to 3 in the market transformation. 16 of the 23 activities have been found. Within the cluster *socio-cultural changes*, only few of the system building activities were found. An explanation for the absence of system building activities in the socio-cultural changes cluster might be the different user targets. Whereas technological innovations are meant for consumers, the implementation of the DSF in the dairy sector is much more focused on B2B markets. Although products that are produced by companies that implemented the DSF are being sold to consumers, communication of DSF towards consumers is not likely to happen as found from the interviews. Also, the implementation of DSF will probably not bring much change for the consumers and therefore it is not likely that there will be much socio-cultural resistance coming from the consumer side.

Although some of the system building activities were not found within the dairy case study, it cannot be concluded that these activities should not be part of the framework. The framework has been built from extensive literature research and case study by Planko et al. (2015). Therefore, it can only be argued that although many system building activities might be of importance for strategic collective system building, not all of the activities are generalizable and some could therefore be case specific.

In conclusion it can be argued that this research has validated the strategic collective system building framework by Planko et al. (2015) for a strategic innovation. Therefore, it is suggested to refine the strategy framework in terms of use of the concept technology. As the strategy

framework was made for technological innovation, concepts in the strategy framework included the term technology. It is proposed to change the use of this concept into the use of the concept *innovation*.

5.2.2. Addition of the newly found activities to the strategic collective system building framework

This research has found several new system building activities that contribute to strategic collective system building. As described within section 5.1, these activities are found through many interviews, observations and documents. Therefore, these are thought to be important additions to the strategy framework. All of the activities are also validated through literature on innovation, innovation systems, network collaboration, trust and communication, governance, sustainability strategies and standards. As can be seen in Figure 7, it is suggested to add a precondition for strategic collective system building, namely *attitudinal and instrumental commitment*. Also, it is suggested to change the cluster *coordination* into the cluster *governance*. As for the activity of standardization, *levels of maturity of sustainability performance and implementation* should be included. In addition, transparency could be derived through *minimum standards, monitoring, reporting, verification and traceability*. And, in order to support governance, *communication* should be included.

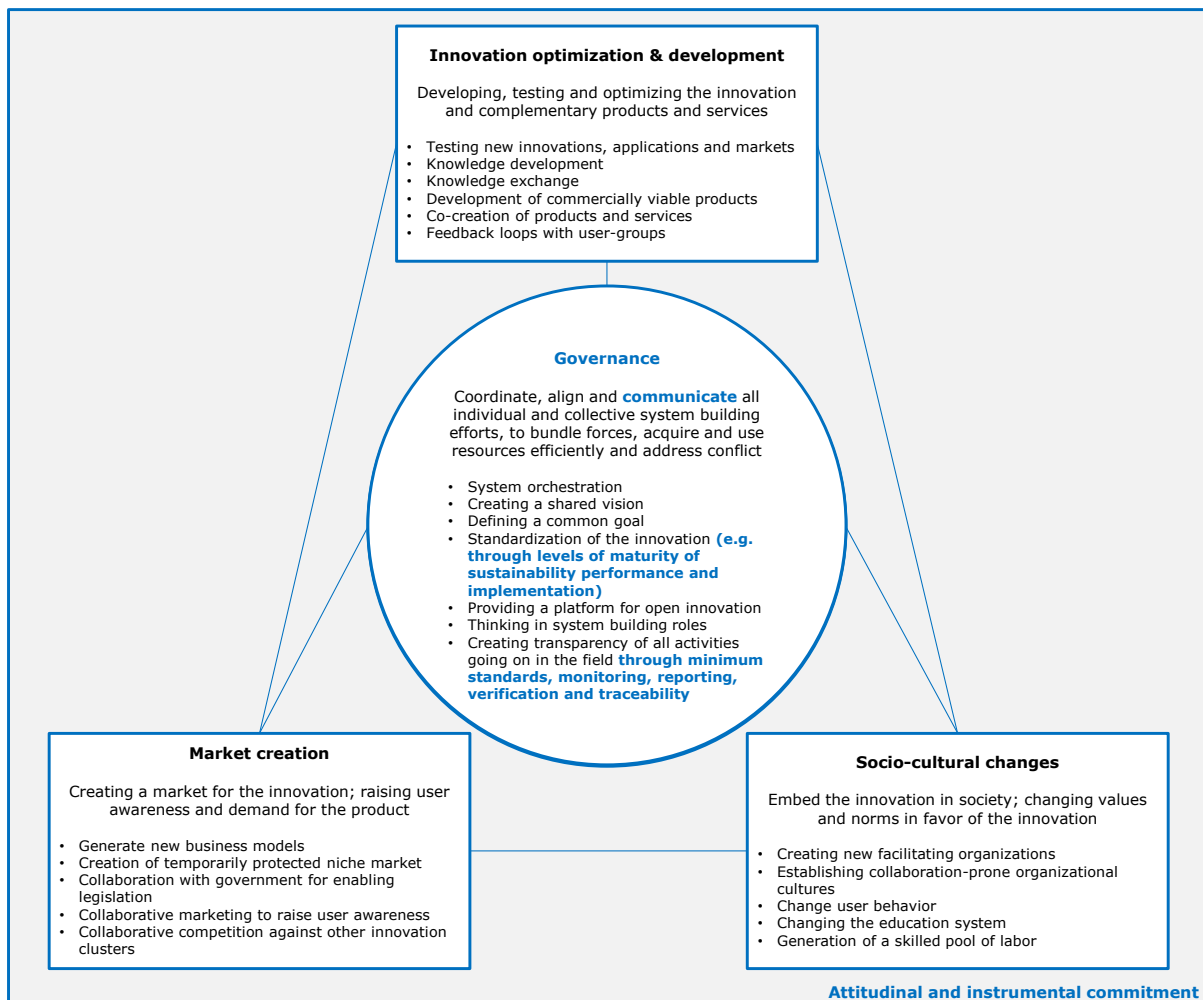


Figure 7. Refined strategic collective system building framework (refinements marked in blue)

The use of the strategic collective system building framework supported a better understanding of the activities needed to implement the DSF, a strategic innovation, in the dairy sector in a credible manner. However, empirical findings showed that additional activities are needed to build

credibility for the DSF in the dairy sector. In order to refine the strategy framework, the new activities have been added. These activities show that the dynamics and mechanisms of implementing the DSF in the dairy sector in a credible manner requires more formal ways of coordination (including monitoring, reporting, verification, minimum standards, traceability and levels of maturity of sustainability performance and implementation), attitudinal and instrumental commitment and communication. Comparable cases have shown to partly support the findings. Especially commitment, communication and governance were found to be important additional activities in the cocoa and coffee sector.

6. Conclusions

The objective of this thesis was to understand the market transformation of the dairy sector in terms of strategic collective system building and, subsequently, to find out how the transforming dairy sector can implement a process approach towards standardization of sustainable dairy production in a credible manner. Understanding the market transformation of the dairy sector by performing a case study to find out what is needed for the credible implementation of the Dairy Sustainability Framework (DSF) at FrieslandCampina facilitated to validate and refine the current literature on strategic collective system building. By this means, it gave insight into the credible implementation of a process approach towards standardization of sustainable dairy production.

First, a theoretical framework was built that combines literature on market transformation and strategic collective system building. It has been argued in literature that sectors and companies should move beyond competing on standards and should rather move towards a more collaborative, international and industry-wide approach towards sustainability in order to create a positive social, environmental and economic impact (Simons, 2015; Watanatada & Mak, 2011). To build this collaboration, so that it creates credible positive social, environmental and economic impact, it has been argued in this thesis to use the strategic collective system building framework, developed by Planko et al. (2015). This framework originates from a combination of (technological) innovation systems and strategic management literature and aims to give guidance to companies that want to strategically collaborate in order to commercialize their sustainability innovation. FrieslandCampina wants to collaboratively implement the DSF with its stakeholders, thereby building a favorable system for the credible implementation of the DSF, being a strategic innovation.

In order to understand the transformation of the dairy sector and to find out what is needed in order to implement the DSF in a credible manner, document review was performed, 27 interviews with both stakeholders of the DSF pilot of FrieslandCampina and representatives of FrieslandCampina were conducted, and many observations were made during the internship at the central office of FrieslandCampina in Amersfoort.

Empirical data showed that the dairy sector is currently moving from a phase of competing on standards towards the institutionalization and adoption of a sustainability strategy by a large part of the dairy sector, phase 3 of the market transformation theory by Simons (2015). Although the dairy sector is not characterized by many sustainability standards, interviewees argued that in order to tackle the sustainability issues in the dairy sector, it should move beyond competing on standards and other initiatives, and instead should aim to standardize and collaborate on sustainable dairy production. Therefore, market transformation, including standardization and collaboration, appeared to be crucial for positive social, environmental and economic impact.

The dairy sector acted upon the need for standardization and collaboration by introducing the DSF, a framework with a process approach towards standardization of sustainability with regional differences and prioritization. Through the DSF pilot that FrieslandCampina is doing in collaboration with two key customers and other stakeholders, it aims to demonstrate sustainable dairy production. Document review, interviews and observations revealed that FrieslandCampina and its stakeholders agree that in order to implement the DSF in a credible manner, it is key to collaborate.

According to the empirical data, several system building activities are needed to build a strategic collective system or collaboration. Through validation of the strategic collective system building framework, it is found that the system building activities found in the case study corresponded to 16 of the 23 system building activities from the strategic collective system building framework (see also Table 2). Hence, validation found that most of the system building activities seem to be applicable to the strategic innovation in the dairy sector. However, the empirical findings showed that in order to implement the DSF in a credible manner, several additional activities are needed. Therefore, this thesis proposes a refinement of the strategic collective system building framework developed by Planko et al. (2015) (see Figure 7). It is suggested to:

1. Add a requirement for strategic collective system building, namely attitudinal and instrumental commitment;
2. Change the activity cluster coordination into governance to capture more formal mechanisms of coordination;
3. Use levels of maturity of sustainability performance and implementation as a way for standardization;
4. Create transparency through the inclusion of minimum standards, monitoring, reporting, verification and traceability;
5. Include communication in the definition of governance.

The inclusion of comparable food cases appeared to be valuable for the research. Findings from interviews with representatives of the cocoa and coffee sector showed that many of the system building activities were also relevant in the cocoa and coffee sector. Especially for the additional activities regarding the strategic collective system building framework, the comparable cases supported the addition of commitment, communication and governance.

As Planko et al. (2015) argued, validation of the strategy framework was needed. This research add to the literature on strategic collective system building as it found that the strategic collective system building framework as developed by Planko et al. (2015) seems to be adequate by combining strategic management (micro) and technological innovation systems (meso) literature, because many of the system-building activities were found in the case study. However, the strategy framework did not appear to be comprehensive yet. Therefore, the theoretical implication of this thesis is a validation and refinement of the strategic collective system building framework that addresses more formal mechanism of coordination based on a case study of a strategic (sustainability) innovation in the dairy sector.

For society, the refined strategy framework will enable actors within an innovation system to build a strategic collective system. The inclusion of formal mechanisms of control will empower them to have more control of the collaboration in order to successfully launch and implement their sustainability innovation. Next to this, the strategy framework, with its refinements, appeared to be very suitable for the market transformation of the dairy sector. Whereas the approach of the DSF is new and guidelines were missing, this strategy framework and case study offer a tool for the dairy industry to successfully move beyond competing on standards and towards institutionalization and the adoption of a critical mass of the DSF and thereby creating positive social, environmental and economic impact.

7. Discussion

This research proposes a refinement of the strategic collective system building framework that addresses more formal mechanism of coordination based on a case study of a strategic innovation in the dairy sector. This case study was performed in the dairy sector and specifically at FrieslandCampina in the Netherlands. The problem definition appeared to be very relevant for the research. As the DSF is using a relatively new approach towards sustainability that includes a process approach with continuous improvement, prioritization of sustainability issues and sector-wide collaboration, many actors were struggling with the absence of guidelines or tools to implement the DSF in a credible manner. Much has been written on the implementation of standards. However, findings showed that the DSF is clearly trying to move beyond being a standard and rather to be regarded as a process approach towards standardization of sustainable dairy production. Therefore, new knowledge needed to be developed on this new approach towards sustainability.

Collecting the data was not regarded as a problem in this research. Interviewees were very willing to contribute to the research as they acknowledged the relevance of the research. However, it should be noted that many of the interviewees were part of the stakeholders involved in the pilot. This means that they could be biased. Although part of the stakeholders was representative of objective organizations, there is general positivism about the DSF, which limits the number of the critical observations. A similar argument could be made for the narrative view of the researcher. As the researcher took part of pilot, objectivity could not be fully ensured.

Next to the interviews, many observations could be made as the research was fully conducted at the central office of FrieslandCampina in Amersfoort and was part of an official pilot program. This enabled the researcher to discuss with many representatives of FrieslandCampina and other stakeholders. However, the collection of documents on the implementation of DSF was rather minimal. As the DSF is a relatively new approach in the dairy sector, not many documents yet existed. The research was therefore rather explorative in terms of document review. Feedback from the other working groups and the steering and advisory board of the pilot enabled to validate the findings and conclusions of the research.

The case study of FrieslandCampina implementing the DSF is a clear example of actors that are collaborating on the implementation of a sustainability innovation and thereby a relevant case study for the validation of the strategic collective system building framework designed by Planko et al. (2015). However, the case study is due to some validity issues. As described in the thesis, the dairy sector is a very diverse sector with regional differences. Therefore, different views on credibility might exist in different regions. This could, subsequently, lead to a difference in activities needed to implement the DSF in a credible manner per region. From observations and meetings with sustainability experts it is found that FrieslandCampina, but also the Netherlands in general, are leading in terms of sustainability. This also means that, compared to other members of the DSF, FrieslandCampina is moving faster towards sustainability than other companies. However, as mentioned by Planko et al.: "the focus in some industries may (..) be slightly different. The specific characteristics of a technology or a domain could result in different weighting of the importance of the activities and of activity clusters" (2015, p. 11). Although they argue that difference might exist in industries, it could be that it also differs per region. It might be that in other regions, similar activities appear to be relevant, but the degree of implementation of these activities is different. For example, standardization might take place or is as relevant in a certain region, but levels of maturity to create standardization are a step too far.

In order to do further research on weighting the importance of the activities and clusters of the strategic collective system building framework, an additional validation step within the current case study could be performed. This could be done through a survey carried out by all the interviewees that focuses on both the validation of the added system building activities found through the empirical data and the importance of the activities and system building clusters in the dairy sector. This could include quantitative measures of the framework relations. Also, related to the difference in degree of implementation, the case study could be performed with a longitudinal

design to follow the development of the collaborations over time. This thesis made use of a cross sectional design, as it only looked into the activities needed at a certain point of time within the pilot. After the pilot has been fully performed, it would be interesting to study retrospectively the development of the collaboration, as this will give insight into the time order in which activities were performed. Also, it could be found whether the approach taken in the pilot for strategic collective system building appeared to be beneficial for the credible implementation of the DSF. This might lead to a further revision of the strategy framework, describing the most efficient time order of the system building activities.

Furthermore, performing a single case study gives rise to external validity issues, thereby making it difficult to generalize the findings. To improve the external validity rich empirical data was obtained. Interviews were held with many stakeholders, of high organizational levels (CEOs, sustainability managers, key account managers etc.) and with much sustainability and/or sector expertise. Also, the internship of 7.5 months at the central office of FrieslandCampina enabled to get much knowledge, documents and observations on the dairy sector and its processes. Furthermore, comparable cases were used to support the findings and to be able to generalize some of the findings. Also, the empirical findings from the research and comparable cases were constantly compared to existing literature on innovation systems, network collaboration, market transformation, governance and sustainability strategies. Therefore, many measures were taken in order to improve the external validity of the research.

In the research, two comparable cases were studied, namely the coffee and cocoa sector. These two sectors are known to also move beyond competing on standards. According to Simons (2015), these are the only sectors in the food industry, next to the dairy sector, that are currently collaborating on sustainability to create a more positive social, environmental and economic impact. It appeared from the research that these two sectors are indeed within the same market transformation as the dairy sector. However, the urgency to move towards the new phase seemed to be higher in these sectors. Also, the collaboration included more informal mechanisms of coordination, including a clear vision and common goal. However, the implementation of sustainability and the activities that were performed to work towards the common goal is different per company. Also, for the credibility of such a sustainability approach, the companies in the cocoa and coffee sector made use of the credibility of existing standards. Therefore, the focus of the collaboration was slightly different than in the dairy sector. Although differences appeared between the coffee, cocoa and dairy sector, similar system building activities were found and the comparison created many insights to market transformation and strategic collective system building.

The literature on strategic collective system building appeared to be very relevant for the research. However, it must be noted that the framework particularly gives a good overview of the *activities* needed to build a strategic collective system. It does not provide *guidelines on how to implement* the system building activities. In the analysis, some suggestions were made on how to implement the additional system building activities, including communicative strategies for enhancing the basic processes relevant to innovation support (Leeuwis & Aarts, 2011) and different modes of governance that could be used within networks (Kenis & Provan, 2007).

In conclusion, in order to further develop the strategic collective system building framework and validate the additional system building activities found within this thesis, additional case studies could be performed for different types of innovation and industries. Also, within other industries or types of innovation, other activities and importance of activities might appear that contribute to strategic collective system building.

8. Advice to business

This research provides a *new strategy framework for collaborating companies that want to implement a strategic sustainability innovation while creating positive social, environmental and economic impact*. This research has been conducted for the dairy sector and a pilot by FrieslandCampina in collaboration with two key customers and other stakeholders in specific. Within this pilot, FrieslandCampina aims to demonstrate credible sustainable dairy production through the implementation of DSF, a process approach towards standardization of sustainable dairy production. Also, they want to understand how they can reduce the number of audits at farm level as this is very costly and time-consuming. Apart from the content of the DSF, including the formulation of KPIs, targets and prioritizations, and marketing of the DSF, FrieslandCampina sought for external substantiation to implement the DSF in a credible manner, thereby demonstrating sustainable dairy production. An answer to the question *'how to implement the DSF in a credible manner?'* was needed to ensure full trust and commitment of all stakeholders in the implementation of DSF in FrieslandCampina.

Empirical data showed that *collaboration is crucial* for the credible implementation of the DSF. As such type of collaboration on a sustainability strategy has not yet been researched in the food industry, guidelines or tools are missing. Only two similar types of collaboration were found, namely in the cocoa and coffee sector. However, no in-depth research was performed on those two sectors either. Therefore, this research *aimed to find what is needed to implement the DSF in a credible manner to be able to demonstrate sustainable dairy production* through a case study and the use of market transformation and strategic collective system building literature. In summary, based on extensive research, it is recommended to the international dairy sector and FrieslandCampina in particular to:

1. Ensure *commitment, willingness and the availability of resources* for the collaboration on sustainable dairy production by all stakeholders;
2. Implement a well-structured *global DSF governance structure* that has a *supportive role* with a focus on:
 - Creating a global shared vision
 - Defining a global common goal
 - Global system orchestration
 - Providing a platform for open innovation for sustainable dairy production
 - Standardizing sustainable dairy production in order to achieve continuous improvement (e.g. by levels of maturity of sustainability performance and implementation)
 - Creating transparency through global minimum standards, monitoring and reporting;
3. Implement a *well-structured governance structure on a regional/firm level through stakeholder engagement* with a focus on:
 - Creating a regional shared vision and a clear sustainability ambition
 - Defining a regional common goal
 - Regional system orchestration
 - Thinking in system building roles
 - Creating transparency through regional minimum standards, monitoring, reporting, verification and traceability;
4. Clearly *communicate* all individual and collective system building efforts;
5. *Optimization and development* of the DSF through testing new applications and markets, knowledge development, knowledge exchange, and feedback loops with user-groups;
6. *Create a business market* for DSF through collaboration with government for enabling legislation and collaborative marketing to raise user awareness
7. *Create socio-cultural changes* through establishing collaboration-prone organizational cultures and changing user behavior

This recommendation shows that in order for the DSF to be implemented in a credible manner, several activities are needed. These do not only include system building activities from the strategic collective system building framework by Planko et al. (2015), but also include additional

activities. One of the first preconditions found in the pilot was the need for commitment, willingness and the availability of resources for the collaboration. These preconditions are defined as attitudinal and instrumental commitment. Meetings with the pilot members showed that there is high attitudinal commitment. Though, it was questioned whether this commitment will also be shown instrumentally once the pilot is finished and FrieslandCampina wants to reduce the number of audits at farm level.

Also, it appeared from the interviews with stakeholders that a well-structured governance structure both at a global and regional level is crucial. This is why it is recommended to first put focus on the system building activities of the governance cluster of the strategic collective system building framework. Whereas in the beginning of collaboration the focus could be on more informal mechanisms of coordination, including creating a shared vision, defining a common goal and system orchestration, more formal mechanisms of coordination could be introduced once the number of stakeholders is increased. This is also found within literature on governance; Alvarez et al. explain that it is important to not treat governance as “a fixed variable to be determined once and for all in the beginning of a relationship, but rather to adapt the coordination mechanisms to the external and internal context of the relationship and the characteristics of the task at hand” (2010, p. 179). This was also mentioned by one of the sustainability experts who argued that the continuous improvement of the DSF should also be reflected in the governance structure (IV sustainability expert, 1). The difference and timing of mechanisms of coordination is also found in the relation between global DSF and the regional/firm implementation. As FrieslandCampina is working together with stakeholders on many of the informal mechanisms of coordination, stakeholders are looking for more formal mechanisms of coordination. However, meetings with actors from the other pilots and the industry showed that the global DSF is still focusing on informal mechanisms of coordination. Therefore, it is recommended for FrieslandCampina to focus on levels of maturity of sustainability performance and implementation, verification and traceability, whereas this currently appears to be too ambitious for the global DSF. This also supports the argument that the strategic collective system building framework can have a different focus per industry, innovation or region.

Also, the research found that several activities for the *optimization & development* of DSF are needed in order to implement the DSF in a credible manner. Within this cluster, four activities were found to be important, namely *testing new innovations, applications and markets, knowledge development, knowledge exchange, and feedback loops with user-groups*. Although feedback loops with B2B customers seemed to be taking place within the pilot, a next step could include feedback loops with consumers.

As for business *market creation* of the DSF, FrieslandCampina could focus on *collaborating with government for enabling legislation*. Although the government is seen as a key stakeholder in the pilot, defining system building roles would create more transparency as to what role the government has within sustainable dairy production. Also, for example, minimum standards for the DSF include legislation. Understanding the dynamics of legislation and the assurance of this legislation appears to be key for creating trust. Another activity that enables market creation and has the potential to have a great commercial impact is *collaborative marketing to raise user awareness*.

Not many observations were made on *socio-cultural changes*. From the research, only the activity *establishing collaboration-prone organizational cultures* and *change user behavior* are thought to be important. Changing user behavior is difficult to measure. However, it is recommended to include this in the research by working group 3 that is looking into marketing and sales of the DSF.

In conclusion, the refined strategic collective system building will function as a guideline for collaborating companies to launch and implement their sustainability framework. Through this research 'lessons learned' were found and the case study of FrieslandCampina served as a clear role model for the implementation of a strategy innovation in the dairy sector.

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10. Appendices

Appendix A. Members of the Dairy Sustainability Framework



Figure 8. Members of the Dairy Sustainability Framework in June 2015 (GDAA, 2015a)

Appendix B. Global Categories: Strategic Intent

Table 3. Global categories: Strategic intents (SustainAbility, 2013)

Global category	Strategic intent
Greenhouse Gas Emissions	GHG emissions across the full value chain are quantified and reduced through all economically viable mechanisms
Nutrients	Nutrient application is managed to minimize impacts on water and air, while maintaining and enhancing soil quality
Waste	Waste generation is minimized and, where unavoidable, waste is reused and recycled
Water	Water availability, as well as water quality, is managed responsibly throughout the dairy value chain
Soil	Soil quality and retention is proactively managed and enhanced to ensure optimal productivity
Biodiversity	Direct and indirect biodiversity risks and opportunities are understood, and strategies to maintain or enhance it are established
Market Development	Participants along the dairy value chain are able to build economically viable businesses through the development of transparent and effective markets
Rural Economies	The dairy sector contributes to the resilience and economic viability of farmers and rural communities
Working Conditions	Across the dairy value chain, workers operate in a safe environment, and their rights are respected and promoted
Product Safety & Quality	The integrity and transparency of the dairy supply chain is safeguarded, so as to ensure the optimal nutrition, quality, and safety of products
Animal Care	Dairy animals are treated with care, and are free from hunger and thirst, discomfort, pain, injury and disease, fear and distress, and are able to engage in relatively normal patterns of animal behavior

Appendix C. Continuous improvement

Continuous improvement (CI) is a widely known principle for continuously improving products, methods, processes and other business activities. CI is often seen as “an important complement to more radical, step-change forms of innovation. In essence, it involves a company-wide process of enabling a continuing stream of focused incremental innovation” (Bessant et al., 1994, p. 17). With regard to sustainability strategies, CI started to become relevant at first as a resource for pollution prevention (Hart, 1995). However, nowadays holistic sustainability strategies that include economic, environmental and social criteria for sustainability also focus on continuous improvement with the use of the PDCA cycle (i.e. Dairy Sustainability Framework (GDAA, 2014c)).

Already in 1950, Deming designed a model for continuous improvement within production, called the Deming cycle (Deming, 1950). Through the years, this model was further developed and transformed into the Plan-Do-Study-Act (PDSA) cycle. In 2006, Moen and Norman (2006) reformulated the study phase of Deming and changed this phase into the check phase, after which the name PDCA cycle was mostly used.

As can be seen in Figure 9, according to the PDCA cycle companies should start with making plans for production – or, in case of FrieslandCampina, when wanting to implement a sustainability strategy, making the sustainability plans and targets – in the *plan phase*. After the plans have been set out, they can be implemented in the *do phase*. Once all the activities are being executed, it can be checked whether they conform to the targets set (*check phase*). When the current activities are being executed according to plan, a company can act upon this by setting new targets and deciding to improve their activities. When targets are not reached, companies should act upon this by making new plans how to improve their activities in such way that targets will be reached (*act phase*).

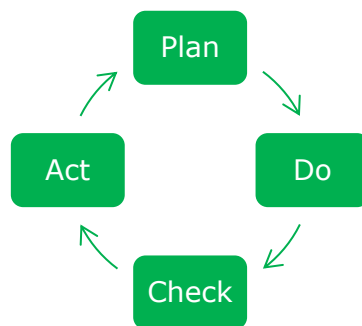


Figure 9. PDCA cycle (Moen & Norman, 2006)

Although the PDCA cycle was already developed in 1950, sustainability strategies that use the PDCA cycle as their foundation face difficulties during certification and verification of the strategy. This is why currently most standards make use of checklists that include minimum required values for their criteria. These standards often stimulate their members to improve their performance. However, no incentives are connected to conforming to continuous improvement. As part of a market transformation of moving beyond standards, building credibility for a framework that uses continuous improvement as its foundation is still a challenge.

Appendix D. List of interviewees

Table 4. List of interviewees

Stakeholder group	Organization and/or function	IV Number	Date interview
Internal	Cooperative affairs	1	5-8-2015
	Cooperative affairs	2	5-8-2015
	Marketing	3	4-8-2015
	Account manager	4	12-8-2015
	Account manager	5	3-8-2015
	Account manager	6	3-8-2015
	Ingredients	7	19-8-2015
	Foodservice	8	31-8-2015
	Foodservice	9	31-8-2015
	Strategy	10	25-8-2015
	Quality	11	19-10-2015
Value chain	Customer	1	3-9-2015
	Customer	2	22-9-2015
	Customer	3	12-8-2015
	Customer	4	6-8-2015
	Customer	5	6-8-2015
External	Industry organization	1	30-7-2015
	NGO	2	12-8-2015
	Bank	3	26-8-2015
	Research	4	14-8-2015
Sustainability expert	Consultant	1	17-6-2015
	Consultant	2	17-6-2015
	Consultant	3	22-6-2015
	Expert	4	23-9-2015
Comparable cases	Cocoa (Marketing)	1	25-9-2015
	Cocoa (Business development)	2	25-9-2015
	Coffee (Sector organization)	3	28-8-2015

Appendix E. List of observations

Table 5. List of observations

Category	#	Date	Activity	Attendees	Notes
Meeting DSF pilot	1	13-03-2015	Kick-off DSF Pilot FrieslandCampina	Steering Board; Advisory Board; working groups	Introduction DSF; members steering board, advisory boards and working group introduction; presentations on approach working groups; next steps
Internal meeting	1	11-05-2015	Introduction to company and relevant employees	Marketing, Cooperative affairs, Communication and Quality	-
Internal meeting	2	03-06-2015	Discussing other standards within the food sector (e.d. het vinkje)	Quality employee	-
External event	1	30-06-2015	Webinar SustainAbility "Global Sustainability trends"	Online webinar	Looking ahead to & beyond COP21; moving from awareness to action on risks inequality; risks of impeding technology breakthrough; A game changer for clean energy; water scarcity escalating on corporate agenda; and others
Meeting working groups	1	06-07-2015	Workshop WG1	Working group 1	Presentation and feedback on evaluation scheme WG1
Internal meeting	3	09-07-2015	Introduction and brainstorming sustainability of fruity drinks	Trainee FrieslandCampina	-
External meeting	1	15-07-2015	Presentation DSF and project planning	NGO	Introducing NGO about DSF and getting feedback on current pilot
Internal meeting	4	21-07-2015	Presentation DSF	Quality consultant	Introducing DSF to quality employee to see similarities with quality standards
Farm visit	1	12-08-2015	Farm visit	Farmer	Introduction to the farm and dairy farming, discussion about current challenges for Dutch farmers
Global pilots meeting	1	21-08-2015	Global pilots meeting	Ireland, USA, Indonesia, New Zealand and the Netherlands	Sharing updates and lessons-learned. Next steps and feedback
Global pilots meeting	2	24-08-2015	Update pilot Indonesia	External consultant	-
External meeting	2	24-08-2015	Update pilot FrieslandCampina	Industry organization	Presentation on DSF pilot FrieslandCampina, feedback and discussion on demonstration scheme
External meeting	3	25-08-2015	Stakeholder engagement	Research organization; sustainability consultant	Defining relevant stakeholders for endorsement
External meeting	4	25-08-2015	Discussion demonstration scheme	Sustainability consultant	Accountancy view on demonstration and evaluation scheme
Internal event	1	27-08-2015	Presentation half-year results 2015	FrieslandCampina	Cheese, Butter & Milkpowder

External meeting	5	23-09-2015	Stakeholder analysis workshop	Research organization; sustainability consultant	Defining stakeholder endorsement strategy
Internal event	2	06-10-2015	Conference sustainable diets	FrieslandCampina	Internal conference and workshop about sustainable diets
Meeting DSF pilot	2	07-10-2015	Pilot meeting	Steering Board; Advisory Board; working groups	Update per working group; feedback of the steering and advisory board; next steps
Internal meeting	5	19-10-2015	Aligning DSF with Duurzame zuivelketen	Quality director	-
External meeting	6	21-10-2015	Presentation and discussion on DSF pilot FrieslandCampina	Industry organization	Presentation about DSF pilot FrieslandCampina and Indonesia
Farm visit	2	21-10-2015	Farm visit	Farmer	Introduction to the farm and dairy farming, discussion about current challenges for Dutch farmers
External meeting	7	27-10-2015	NGO endorsement	NGO; sustainability consultants	Defining NGO endorsement approach
External meeting	8	29-10-2015	Marketing and communication DSF	Communication consultant	Orientation on marketing and communication of DSF
Internal event	3	06-11-2015	Internship day FrieslandCampina	Current interns of FrieslandCampina	Presentation about FrieslandCampina, dairy farming, career options and a farm visit.
Internal meeting	6	11-11-2015	Discussion CSR and LCA	R&D employee FrieslandCampina, LCA expert	Discussion about DSF, CSR and LCA within FrieslandCampina

Appendix F. Interview presentation



A collaborative approach to sustainability in the global dairy value chain

Dairy Sustainability Framework

Introduction and implementation at FrieslandCampina

September 2015



Willingness within the dairy sector to become more sustainable

Sustainability challenges in the dairy sector

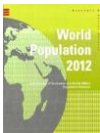


"**Human influence** on the **climate system** is clear and growing, with impacts observed across all continents and oceans" (IPCC)

livestock's long shadow



"... **livestock sector** emerges as one of the two or three most significant contributors to the **most serious environmental problems** ... on a massive scale" (FAO)



World population is expected to grow exponentially in the coming years to a population size of over **9.5 billion** people in 2050 (United Nations)



"Milk and dairy products play a **key role in healthy human nutrition and development** throughout life" (FAO)

2

Trend of moving beyond standards and towards sector-wide collaboration

Global trend in sustainability strategies



3

From an industry-wide agenda to the implementation of a global framework

Timeline of the Dairy Sustainability Framework



4

Uniform global framework to demonstrate sustainability of dairy

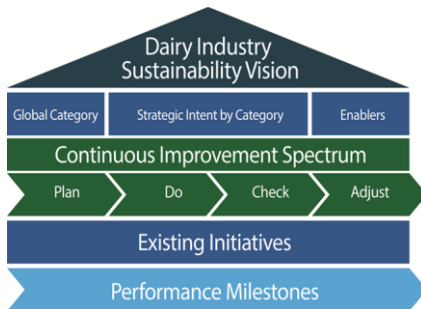
International dairy commitment



5

Framework with process approach towards 11 sustainability themes

Dairy Sustainability Framework

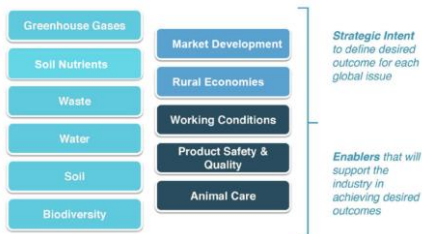


Global layer

- Overarching sustainability vision for the global dairy sector
- A series of eleven sustainability issues, each incorporating a number of sub-issues

Regional layer

- Prioritization of the issues relevant to that region along with a catalogue of current initiatives placed within a continuous improvement spectrum



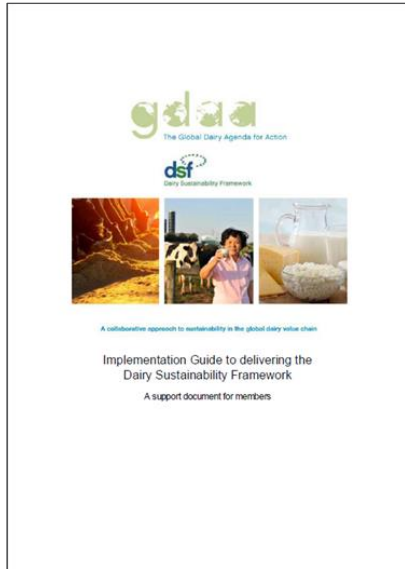
Sustainability themes

- Focus on eleven globally applicable sustainability criteria
- Outline of the high level objective (Strategic Intent) that the dairy sector commits to working towards for each of these criteria

6

Implementation guide to support DSF implementation at regional level

7 implementation steps and enablers



7

DSF triggers a credible process of continuous & significant improvement

Success factors of DSF



Sector-wide collaboration: A system of data collection, alignment and reporting that demonstrates the continuous sustainability progress by the sector globally



DSF allows for **regional tailoring**: every dairy region can prioritize the material issues for its own value chain



Continuous improvement: DSF will lead to material improvements at all DSF users – Frontrunners as well as laggards



DSF has a **holistic view** on sustainability and does not allow to neglect any material issues



DSF allows for **external verification** on **implementation methods** rather than at farm level, leading to reduction of administrative burden



DSF is **accessible**: every dairy company and dairy farmer with sustainability ambitions can start regardless of starting position



DSF fits with **SAI** requirements

8

Pilot in the Netherlands to obtain learnings on implementation of DSF

Objectives of DSF pilots

Currently, **5 pilots** in several regions to implement the Dairy Sustainability Framework (Ireland, US, Netherlands, Indonesia and New Zealand)

Objectives:

- Review of the guidance document in practice
- Stakeholder identification and role of stakeholders
- Approach materiality analysis (prioritization 11 themes)
- Approach to formulate objectives and KPIs

Netherlands: **FrieslandCampina** in collaboration with **two key customers**

Objective:

- Regional application Dairy Sustainability Framework (Netherlands)
- Demonstrate that dairy production and processing of FrieslandCampina meets the criteria DSF
- Investigate external verification
- Investigate consumer benefits (B2B and B2C)

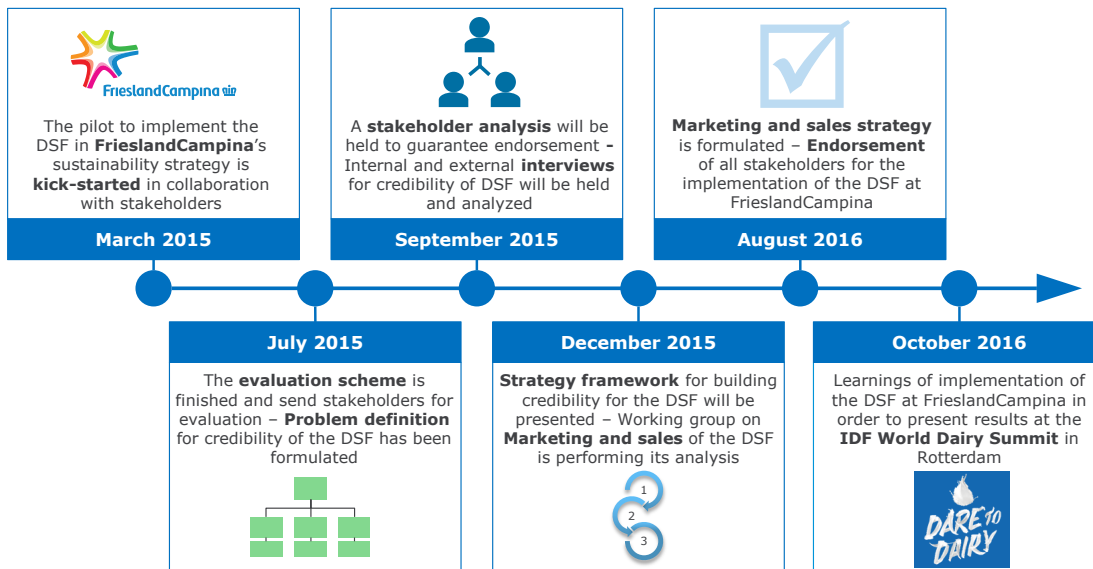
Scope:

- Dairy farming in the Netherlands (based on Sustainable Dairy Chain approach)
- Milk production and processing

9

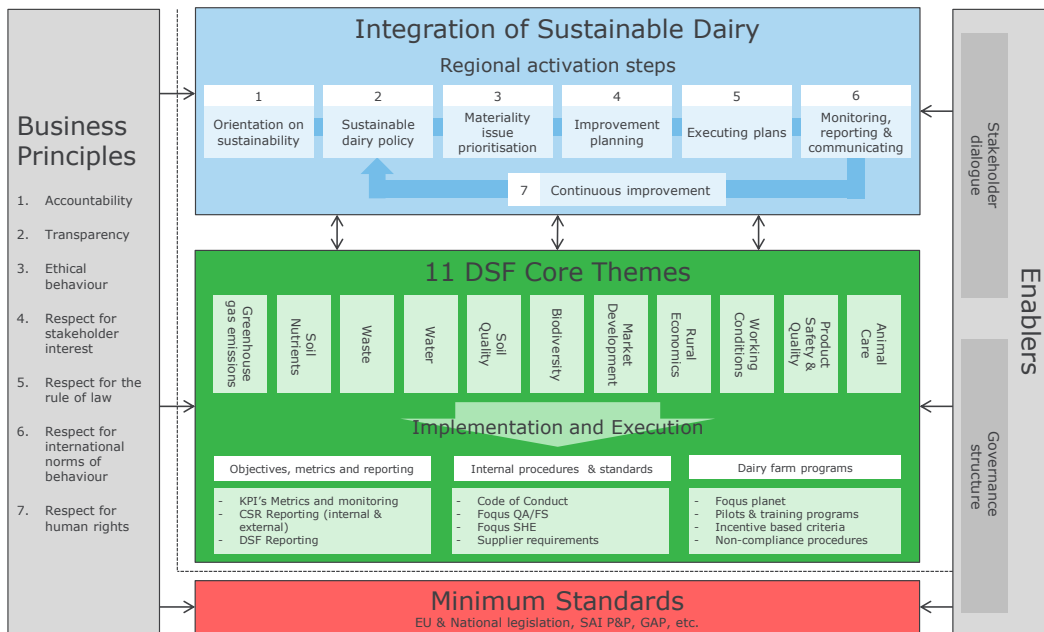
In the pilot, groups are working on materiality, credibility and marketing

Timeline of the FrieslandCampina Pilot



10

DSF Demonstration scheme



Appendix G. Interview structure

Introduction

The dairy sector wants to become more sustainable and therefore I would like to get your ideas and vision on the credibility and implementation of sustainable dairy with use of the Dairy Sustainability Framework. As key stakeholder of FrieslandCampina it is important to be familiar with the DSF and therefore I am very curious about your input. I will give a short introduction of myself.

I am Sofie van Olst, master student Sustainable Business and Innovation at Utrecht University and currently writing my thesis for FrieslandCampina for three months now. My research is on building credibility for sustainable dairy with the DSF in collaboration with Jaap Petraeus. This means I am tackling the problem both theoretically and practically with use of interviews at FrieslandCampina and with stakeholders, including you. I think it is important to get insight into the way in which FrieslandCampina can implement the DSF in the right way and I think your input as key stakeholder will be interesting.

I prepared a couple of questions for this interview and I hope we can discuss them in the next coming hour. Do you mind if I tape the interview? For my research I need to write a transcript of the interview. After the interview I could send it to you in case you want to reread or adjust it.

First, some short questions to learn more about you:

1. What is your job function in your company?
2. For how long have you been working at your company? For how long in your current position?
3. In what ways are you working with sustainability within your daily job?

Dairy Sustainability Framework

4. Are you familiar with the Dairy Sustainability Framework?
 - i If yes, what do you know about it already? → Presentation
 - ii If no, I will shortly introduce you to it → Presentation

FrieslandCampina believes that the DSF is the solution to long checklists and has the chance to become a global framework that everyone can join so that sustainability can be implemented at all sorts of companies and regions.

5. Why should FrieslandCampina implement (or not) the DSF according to you?

'Credibility' of the DSF

Next to the content of the DSF with regards to the eleven themes it is also important to be able to demonstrate sustainable dairy. We use the theme credibility for this, with the definition of creating of trust and making it look plausible so that you can demonstrate sustainable dairy.

6. What does credibility mean to you? What is your definition of credibility?
7. When would the DSF be credible according to you?
 - i Why?
 - ii What is needed in order to make it credible?
 - Why these activities? What do these activities make it credible?
 - How do these activities need to be carried out?
 - By whom need the activities be carried out?
 - iii Who needs to be involved internally and externally?

Implementation

Like has been told in the presentation, experts tell that we need to go towards a more collaborative approach towards sustainability in which organizations within the value chain and stakeholders collaborate. This will create more positive impact on society and the environment. Although standards are most widely used, the dairy sector wants to work towards standardization of sustainability with a focus on processes rather than a solid state. This requires collaboration

with suppliers, customers and other stakeholders. The DSF offers a solution to this and that is the reason why FrieslandCampina wants to implement it in such way.

8. Do you think that this new phase of becoming more sustainable is the right one?
 - i If no, why not?
 - What would be a better way to go?
 - Why would this be better?
 - The DSF is built around this new vision on the implementation of sustainability. If we want to include your opinion “question 9/10/11/12” so that it does fit within your vision?
 - ii If yes, why?

Within the global implementation of the DSF:

9. What should we do in order to further develop and optimize the DSF as an international framework for sustainable dairy?
 - i Why?
 - ii Which actors should be involved?
 - iii What activities are needed?
 - Why these activities?
 - How do we need to execute these activities?
 - By whom?
10. How should we create a market for products that are produced by companies that implemented the DSF?
 - i Why?
 - ii Which actors should be involved?
 - iii What activities are needed?
 - Why these activities?
 - How do we need to execute these activities?
 - By whom?
11. What changes in society are needed to build credibility for the DSF?
 - i Why?
 - ii Which actors should be involved?
 - iii What activities are needed?
 - Why these activities?
 - How do we need to execute these activities?
 - By whom?
12. How should the implementation of the DSF within organizations and regions be coordinated?
 - i Why?
 - ii Which actors should be involved?
 - iii What activities are needed?
 - Why these activities?
 - How do we need to execute these activities?
 - By whom?
13. How do these activities contribute to the credible implementation of the DSF?
14. Do you think there are other things that FrieslandCampina should keep in mind or that it should focus on with the implementation of the DSF?
 - i Why?
 - ii Which activities are needed?
 - Why these activities?
15. What do you think of the continuous improvement approach of the DSF in which regions at different levels of sustainability can join and all work towards become more sustainable?
 - i What effect does this have of the credibility of the DSF?
 - Why?
 - If negative, what could FrieslandCampina do in order to build credibility for the continuous improvement part of the DSF?

Working with the DSF

It is really important for FrieslandCampina that the DSF is endorsed by the whole value chain and that everyone can work with it. Next to this, your role as a stakeholder has influence on the credibility of the DSF.

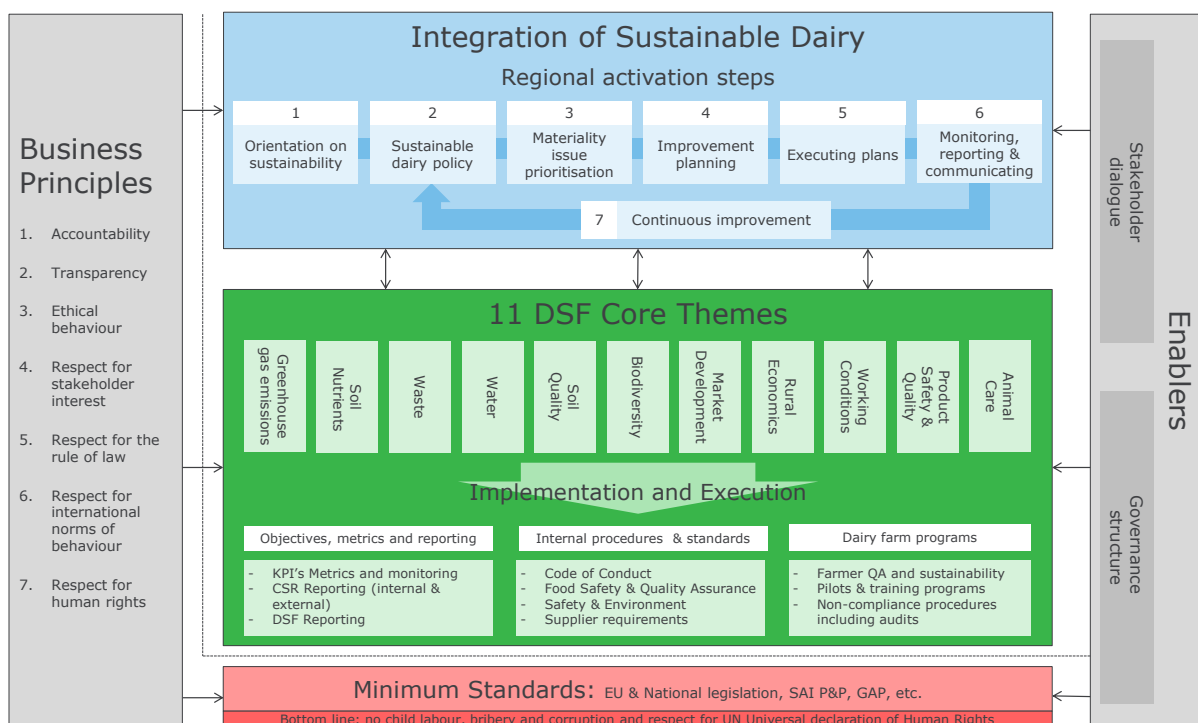
16. Under which circumstances would you be willing to work with the DSF?
 - i Why?
 - ii What does FrieslandCampina needs to work on in order to do this?
17. What do you need in order to work with the DSF?

Closing

18. We just discussed many aspects of the implementation of the DSF and its credibility. In order to wrap up the interview, what is your top 3 (or 5) activities that are needed to build credibility for the DSF?
19. Do you have any questions or recommendations?
20. In case I have some questions after the interview to get some more insight or to better understand your answers, could I get in contact with you again by mail?
21. Do you have any documents in which I can find more information on the things you have just told?

Appendix H. DSF Demonstration scheme

Within the demonstration scheme, the integration of sustainable dairy follows the seven steps of the implementation guide, which is the implementation of the DSF on the 11 core themes (see Figure 10). On the right side of the scheme, the enablers, also from the implementation guide can be found. On the left side the business principles, coming from ISO26000, can be found, which represent the items of 'doing good business'. From the first interviews, both from working group 1 and 2, it became clear that in order for the implementation of the DSF at firm (regional) level, minimum standards are crucial. Therefore, these have been included in the demonstration scheme. According to most of the interviewees, the demonstration scheme appears to be comprehensive, complete and might help firms to translate the global layer of the DSF to the regional implementation. FrieslandCampina was able to implement this demonstration scheme by constant stakeholder dialogue, which, through observations, appeared to be key for transparent and credible implementation of the DSF. The demonstration scheme has been recommended to the DSF global board to be adopted by all members.



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Figure 10. Dairy Sustainability Framework demonstration scheme