

City Research Online

City St George's, University of London

Citation: Gungor, C. (2019). Collaborative learning and knowledge sharing in food sustainability. (Unpublished Doctoral thesis, City, University of London)

This is the accepted version of the paper.

This version of the publication may differ from the final published version. To cite this item please consult the publisher's version.

Permanent repository link: https://openaccess.city.ac.uk/id/eprint/23673/

Copyright and Reuse: Copyright and Moral Rights remain with the author(s) and/or copyright holders. Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge, unless otherwise indicated, provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way. For full details of reuse please refer to City Research Online policy.

City Research Online: http://openaccess.city.ac.uk/ publications@citystgeorges.ac.uk

Collaborative learning and knowledge sharing in food sustainability

Ceyhun Güngör

Centre for Food Policy
Department of Sociology, City, University of London
September 2019

[This page is intentionally left blank]

Table of Contents

Table of Contents **3**

Table of Figures **6**

Table of Tables **8**

Acknowledgements **10**

Abstract **12**

Acronyms **13**

1 Chapter Setting the problem **15**

1.1 The many faces of sustainability **19**

1.1.1 The historical background to sustainability 20

1.1.2 The modern meanings of sustainability 22

1.2 Food and sustainability **37**

1.3 Why does food sustainability matter for the food industry? **46**

1.4 The role of collaborative knowledge in food sustainability **49**

1.5 Subject and scope of the research **52**

1.6 Summary **54**

2 Chapter Literature review and theoretical background **59**

2.1 Multi-stakeholder collaborations **60**

2.1.1 Collaborative platforms in the policy context 60

2.1.2 Theories on collaboration and collaborating 63

2.1.3 Motives of forming a multi-stakeholder collaboration 66

2.1.4 Risks of forming a multi-stakeholder collaboration 69

2.1.5 Structure and type of collaborative platforms 71

2.1.6 The role of a non-competitive environment 74

2.2 Collaborative learning and knowledge sharing **76**

2.2.1 The spectrum of knowledge 78

2.2.2 Knowledge construction and ideology 81

2.2.3 Collaborative learning in the context of sustainability through creativity 82

2.2.4 Adaptive-anticipatory-action-loop-learning 83

2.2.5 Collaborative learning through dialogue 85

2.2.6 Multi-dimensional sustainability influence change memework 88

2.2.7 Nonaka's knowledge spiral 92

2.2.8 Social capital and the creation of knowledge within collaboration 93

2.3 Knowledge in policy **97**

2.3.1 Knowledge providers and users in policy 98

2.3.2 Types of knowledge and their use by policy actors 102

2.3.3 Collaborative policy groups and their role as epistemic communities 104

2.3.4 Punctuated equilibrium / Interest groups and issue networks 105

2.3.5 The aspect of agenda setting 107

2.3.6 Bryant's knowledge policy-change model 111

2.4 Summary 114

3 Chapter Research design and methodology 120
3.1 Research questions 120
3.2 Research design 123
3.3 Multiple-Case study research design 128
3.4 Sampling 132
3.5 The case studies 136
3.5.1 The SCP Roundtable 137
3.5.2 The Product Sustainability Forum 145
3.6 Exploration of potential research designs and methods 150
3.7 Data collection 153
3.7.1 Qualitative semi-structured interviews 154
3.7.2 Qualitative document analysis of primary publications 158
3.8 Literature review 160
3.9 Data analysis 165
3.10 Structure for data presentation and analysis 168
3.11 Ethical consideration 170
3.12 Summary 171

4 Chapter Research findings 176
4.1 RQ1: Motives for participating in collaborative platforms 178
4.1.1 The finding of common and shared understanding of food sustainability 179
4.1.2 Unsustainable practices and their tangible effect on the food system 181
4.1.3 The bandwagon effect and the presence of a respected actors 182
4.2 RQ2: Mechanisms and processes of collaborative learning 186
4.2.1 Agenda setting and power distribution 187
4.2.2 Formal vs. informal forums 192
4.2.3 The role of competitiveness and trust in knowledge sharing and learning 195
4.2.4 Collaborative joint activities 199
4.2.5 The role of a knowledge-hub and neutral actors 203
4.2.6 The role of digital online platforms in knowledge sharing and learning 206
4.3 RQ3: Types of collaborative knowledge in food sustainability 210
4.3.1 The organisation of existing knowledge 215
4.3.2 Organisational knowledge on the food value chain 218
4.3.3 The dominance of ‘‘scientific knowledge’’ 224
4.3.4 Knowledge on the nexus of food sustainability and business 230
4.4 RQ4: The impact of collaborative knowledge on food sustainability 236
4.4.1 Concrete and direct food policy recommendations 237
4.4.2 Improved understanding of food sustainability 241
4.4.3 Voluntary Industry led changes with the aim to improve food sustainability 246
4.5 Summary 249

5 Chapter Analysis and discussion 254
5.1 RQ 1 Motives of collaborating in the food system 256
5.1.1 The motives of stakeholders in joining a collaborative platform 256
5.1.2 The inclusion and exclusion of actors through motives and practical barriers 264
5.2 RQ2: Mechanisms and processes of collaborative learning 270
5.2.1 Agenda Setting and power distribution 271

5.2.2 Formal vs. Informal knowledge forums within collaborative platforms 280
5.2.3 Competitiveness and trust in collaborative learning and knowledge transfer. 287
5.2.4 Joint collaborative activities..... 291
5.2.5 The role of a knowledge hub and neutral actors..... 297
5.2.6 The role of digital online platforms in knowledge sharing and learning 302
5.3 RQ3: Types of collaborative knowledge in food sustainability..... 307
5.3.1 The organisation of existing knowledge 312
5.3.2 Organisational knowledge on food systems..... 316
5.3.3 Formal, scientific and pragmatic knowledge 322
5.3.4 Knowledge on the nexus of food sustainability and business 327
5.4 RQ4: The impact of collaborative knowledge on food sustainability..... 332
5.4.1 Concrete and direct food policy recommendations 334
5.4.2 Improved understanding of food sustainability..... 338
5.4.3 Voluntary Industry led changes with the aim to improve food sustainability.. 342
5.5 Discussion..... 345
5.5.1 Collaborative platforms in the food system 345
5.5.2 Collaborative knowledge in food sustainability..... 350
5.5.3 The knowledge food sustainability dilemma within collaborative platforms .. 355
5.6 Summary..... 359

6 Chapter Conclusion and Reflections 363
6.1 Introduction..... 363
6.2 Concluding summary..... 363
6.3 Reflections on research process..... 377
6.4 Recommendations from this research..... 383
6.5 Future research..... 387

Appendices..... 413
Appendix A: Case study protocol..... 413
Appendix B: Documents analysed by case study..... 416
Appendix C: Ethical Approval..... 417

Table of Figures

Figure 1.1 Emergence of multi-stakeholder platforms in the food system 16
Figure 1.2 Sustainability as the point where Environment, Economy and Social factors meet .. 26
Figure 1.3 Environmental sustainability and its fundamental position 31
Figure 1.4 Food policy and its competing issues 40
Figure 1.5 Schematic overview of the global agri-food system 42
Figure 1.6 Example of a value chain in the food system 45
Figure 2.1 Framework for collaboration type 72
Figure 2.2 Framework for networking styles 73
Figure 2.3 Symmetrical and Asymmetrical learning 75
Figure 2.4 Knowledge barrier and a new sustainable mental model 83
Figure 2.5 Argyris loop-learning model 84
Figure 2.6 DIAD theory model 88
Figure 2.7 Learning through alignment 89
Figure 2.8 Individual internalisation of sustainability 91
Figure 2.9 Multi-Dimensional Sustainability Influence Change Memework 91
Figure 2.10 Nonaka's knowledge spiral 92
Figure 2.11 The impact of social capital on knowledge creation and transfer 94
Figure 2.12 Punctuated equilibrium 106
Figure 2.13 Levels of Agenda and interest groups 109
Figure 2.14 Knowledge-food-policy-change model 112
Figure 2.15 Key areas of literature 118
Figure 3.1 Logical structure of the research questions 123
Figure 3.2 Seven stages of research and their relationship to the thesis chapter 127
Figure 3.3 Logo of the SCP Roundtable 137
Figure 3.4 Governance Structure of the SCP Roundtable 139
Figure 3.5 PSF Path Finder Project Sector Map 148
Figure 3.6 PSF Path Finder Project Heat Map 149
Figure 3.7 Identification methods for the 16 themes 169
Figure 4.1 Logical structure of the research questions: Motives 178

Figure 4.2 Logical structure of the research questions: Knowledge activities 186
Figure 4.3 Logical structure of the research questions: Knowledge output..... 210
Figure 4.4 Excerpt from PSF/WRAP Report on potato supply chain 213
Figure 4.5 Excerpt from PSF/WRAP Report on beef 213
Figure 4.6 Excerpt from SCP Roundtable's ENVIFOOD Protocol..... 221
Figure 4.7 Improvement of greenhouse gas emissions in the food life cycle 222
Figure 4.8 Resource depletion Improvement in the food life cycle (SCP Roundtable)..... 222
Figure 4.9 PSF Grocery Sector Map 226
Figure 4.10 Extract from PSF's toolkit for fresh produce..... 226
Figure 4.11 Extract of the SCP Roundtable's ENVIFOOD Protocol..... 229
Figure 4.12 Excerpt of PSF's presentation on the Potato Value Chain pathfinder project..... 232
Figure 4.13 Figure Logical structure of the research questions: Knowledge output..... 236
Figure 5.1 Logical structure of the research questions..... 254
Figure 5.2 Concept of analysis for Motives..... 256
Figure 5.3 Collaborative benefit of avoiding additional work 261
Figure 5.4 Concept of analysis for Knowledge activities..... 270
Figure 5.5 Collaborative learning on food sustainability and the role of agenda..... 279
Figure 5.6 Collaborative learning environments in food sustainability..... 283
Figure 5.7 The role of knowledge and competitiveness in the context of food sustainability. 288
Figure 5.8 Competitiveness in the food and drink sector and its impact sphere 290
Figure 5.9 Cross-cutting learning typologies..... 293
Figure 5.10 Learning typologies of collaborative platforms in food sustainability..... 294
Figure 5.11 Collaborative learning typologies and their applicability to organisational orders301
Figure 5.12 Concept of analysis for Knowledge output..... 307
Figure 5.13 Changing food sustainability challenges..... 311
Figure 5.14 Ideal vs. realistic spectrum of organisational knowledge..... 317
Figure 5.15 Concept of analysis for Knowledge impact..... 332

Table of Tables

Table 1.1 Selected definitions of 'Sustainable Development' 27
Table 1.2 Selected definitions of food sustainability 38
Table 2.1 Common elements of definitions of collaboration 64
Table 2.2 Motives to collaborate (literature) 66
Table 2.3 Learning typologies according to their loops and processes 85
Table 2.4 Characteristics of learning typologies 85
Table 2.5 Cross-tabulation level of learner and context of learning 90
Table 2.6 Example of a learning cross tabulation 90
Table 2.7 Types of knowledge utilisation in policy making 99
Table 2.8 Type of knowledge providers in the policy making context 100
Table 2.9 Categories of relationships between Knowledge provider and policy maker 101
Table 3.2 Criteria for case study choice 132
Table 3.3 Potential Case Studies 133
Table 3.4 Members of the SCP Roundtable 137
Table 3.5 Members of Food and Drink Europe 138
Table 3.6 Focus of the Working Group 4 144
Table 3.7 Members of the Product Sustainability Forum 146
Table 3.8 Whole-chain resource efficiency projects 147
Table 3.1 Interviewees by case study 157
Table 3.9 Strategy and overview of the literature research 163
Table 3.10 Stages of the explanations building process in a case study research design 167
Table 4.1 Key themes and their relationship with the research questions 176
Table 4.2 Examples of joint projects 199
Table 4.3 Self-reflecting statements of the PSF and SCP Roundtable 225
Table 4.4 Participants to SCP Roundtable's ENVIFOOD pilot test 243
Table 5.1 Key research themes in relation to research questions 255
Table 5.2 Motives in literature vs motives from case studies 258
Table 5.3 Dimensions of power and agenda setting 277
Table 5.4 Learning stages in collaborative case studies from an actor perspective 295

Table 5.5 Risks and benefits of a neutral knowledge hub 298
Table 5.6 Potential rationales for novel knowledge over existing knowledge 314
Table 5.7 The focus of the PSF on the potato pathfinder project 318

Acknowledgements

I gratefully acknowledge the funding received towards my PhD from the Studienstiftung des Deutschen Volkes, as my whole research would not have been possible without their support. I would like to express my sincere gratitude to my advisors Prof. Tim Lang and Dr. Claire Marris for their continuous support of my PhD and research, for their patience, immense knowledge and inspiration. Their guidance helped me throughout the entire process of writing this thesis. I could not have imagined having better advisors and mentors for my doctorate. I would also like to thank my former supervisor Prof. David Barling who saw the potential in me and my ideas and provided guidance into the world of academia and food policy.

I would like to thank all my PhD colleagues, with whom I have shared moments of deep anxiety but also a lot of excitement and an amazing exchange of ideas. Especially my friend and colleague Karl-Axel who taught me the benefits of maintaining a healthy body and mind. A warm word for my colleague Jon, who was always up for a run before work. My colleagues Kelly and Lindy who always had a word of encouragement and who helped me dealing with the bureaucracies of doing a PhD; and Natalia with whom I got lost in German nostalgia. I count myself lucky to have had Dani, Jamie, Jon and Claire as amazing proof-readers and I am grateful for their help.

A very special word of thanks goes to my parents, Ahmet and Esme, who have been great over the years and never raised an eyebrow when I claimed my thesis would be finished 'in the next two weeks' for nearly a year, and I owe special thanks to my sister Eda.

Last but not least I would like to thank my friends, who supported me throughout my research. I am grateful to my partner Dani who was always on my side with all her love and support. Thanks to my 'brother' Tobi with whom I bonded stronger despite the geographic distance between us; and my other 'brother' Tibo for always surprising me. A big thanks to my friend Johnny and Joel for their loyalty and support at the early of embarking on this project. I would like to thank the Tri London club members and especially my training colleagues Kevin, Luke and Jamie for pushing me every day to outstanding performances.

DECLARATION

I declare that the work presented in this thesis, except those elements specifically declared, is all my own work carried out and finished at City University, of London.

COPYRIGHT DECLARATION

The author accepts the discretion of the City, University of London Librarian to allow the thesis to be copied in whole or in part without the prior written consent of the author. This thesis may be made available for consultation within the University library and may be photocopied only in single copies or lent to other libraries for the purpose of study.

Abstract

This thesis critically analyses food related collaborative platforms and the role of their knowledge in food sustainability. It explores how these collaborative platforms learn and how their knowledge impacts food sustainability.

The existing literature suggests that contemporary and future food sustainability challenges are getting more complex and that collaborative multi-stakeholder platforms are one response to this. Although these have not been studied, the literature suggests that the role of knowledge and collective learning within collaborative platforms might be an essential element for developing effective solutions to food sustainability challenges.

This thesis therefore sets out to study two collaborative platforms, the UK Product Sustainability Forum and the European Food Sustainable Consumption and Production Roundtable, to analyse what they do, how they work and what influence they have within food sustainability. These two platforms were selected, because they work in the area of food sustainability, provide guidance to stakeholders in the food system, involve government representatives and they emphasise their desire to create and share knowledge collaboratively on food sustainability.

The analysis shows the importance of collaborative multi-stakeholder platforms within food sustainability and highlights the critical role of collaborative learning and knowledge sharing. This study shows that collaborative learning on food sustainability is influenced by strong motives of pragmatism, financial benefits and strengthening the resilience of the agro-industrial food system. These aspects not only endorse past and unsustainable practices in the food system, but also limit the creation of effective knowledge that can help to solve current food sustainability challenges.

Thus, even though food related collaborative platforms are a form of solution to understand and act on current and emerging food sustainability challenges, the research has shown that at present they are only partially promoting effective solutions. The thesis argues that there is the potential to improve existing food related collaborative platforms and their learning on food sustainability. These improvements can help to implement and operate food related collaborations on a local, national and international level.

This research is the first exploration of learning and knowledge transfer within food related collaborative platforms that work on sustainability challenges. The findings provide guidance to food collaborations, policy makers, food industry, civil society and academia to help understand and utilise collaborative learning and knowledge within food sustainability.

Keywords: Collaborative platforms, food industry, knowledge, politics, collaborative learning, knowledge transfer, sustainability, food systems

Acronyms

AGRO	Agricultural
CSR	Cooperate Sustainable Responsibility
Defra	Department for Environment, Food and Rural Affairs
DIAD	Diversity, Interdependence, Authentic Dialogue
DOP	Digital Online Platforms
EC	European Commission
ECO	Ecological
EEA	The European Environment Agency
EU	European Union
GHG	Green House Gas
HFM	Harmonised Framework Methodology
IGD	The Institute of Grocery Distribution
INPSI	The International Product Sustainability Network
IoT	Internet of Things
LCA	Life Cycle Analysis
MuSIC	Multi-dimensional sustainability influence change memework
NGO	Non-governmental organization
PEF	European Product Environmental Footprint
PSF	The Product Sustainability Forum
Rio +20	United Nations Conference on Sustainable Development
RCT	Randomised Controlled Trails
RO	Reduction Opportunities
SAI	Sustainable Agriculture Initiative
SCP Roundtable	The European Food Sustainable Consumption and Production
UK	The United Kingdom of Great Britain and Northern Ireland
UN	United Nations
UNEP	United Nations Environment Programme
US/USA	United States of America
WCED	World Commission on Environment and Development
WCRE	Whole-Chain Resource Efficiency
WG	Working Group
WRAP	Waste & Resources Action Programme
WWF	World Wide Fund for Nature
WWII	Second World War

[This page is intentionally left blank]

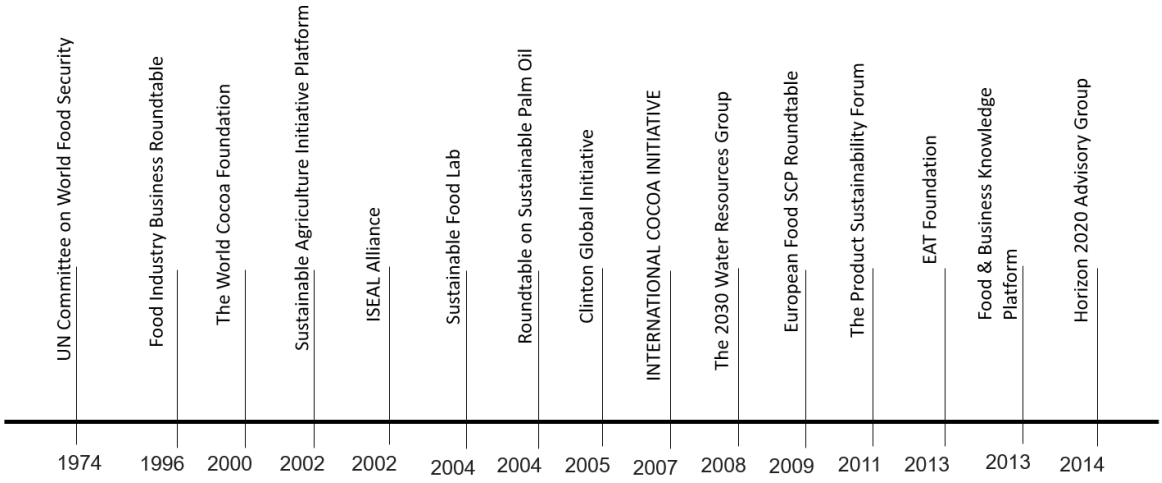
1 Chapter Setting the problem

This research sets out to explore food related multi-stakeholder collaborations and their role as knowledge creators and providers in the context of food sustainability. This research looked in particular at two food industry led collaborations and how they address food sustainability challenges. The collaborations were explored through interviews and document analysis over a period of more than three years.

The last decades have shown that there are national and international shifts in food policy that indicate a movement from state regulations towards stronger governance structures. These structures comprise existing processes and mechanisms that regulate and steer activities in the food system. Such governance structures can result in the appearance of more market-based instruments and voluntary agreements between industry, government and civil society. This in turn can enhance collaborative activities between different stakeholders in the food system and foster the emergence of such formats (Jordan et al. 2005; Barling and Duncan 2015).

Figure 1.1 illustrates some examples of multi-stakeholder platforms that work on food related topics. These platforms are only a fraction of groups that work on food related topics and represent an exemplary overview regarding the variety of food related multi-stakeholder platforms. It is interesting to observe that over the last decades, food related platforms appear to have gained more presence across different areas of the food system.

Figure 1.1 Emergence of multi-stakeholder platforms in the food system



Source: Own figure

This also confirms existing studies that point out the emergence of collaborative initiatives concerning work on sustainability. These range from areas such as consumption, management or environmental technology (Vachon and Klassen 2008; Da Silva et al. 2013; Ding et al. 2018). The term 'collaborative platform' is used throughout this thesis and is defined as two or more independent stakeholders from civil society and/or industry that make an agreement in which the members voluntarily collaborate on a non-competitive or pre-competitive basis without formal relationship, but through mechanisms that provide reciprocal advantages to achieve goals that members have in common (Gray 1985; Gray 1989; Pellicelli 2003; Inkpen and Tsang 2005). It is critical to note that knowledge developed through collaborative learning always starts from an individual basis and impacts collective group learning/knowledge sharing (Huxham 1996; Pellicelli 2003; Fadeeva 2005; Innes and Booher 2010).

Unsustainable practices and developments in the food system have led to negative effects on the wellbeing of humans and the environment. This includes the depletion of natural resources, which directly lead to financial uncertainty for the food industry. This development has been fostered through globalisation and internationalisation of supply chains. Such a crisis became evident in the last world food crisis 2007-2008. As a result, the food system is run on unsustainable practices with complex and 'messy' stakeholder actions (Lang et al. 2009; McMichael 2009). Examples include large food and drink

companies such as Nestlé or Unilever that gained strong political and economic power within the agro-industrial food system, or the emergence of private eco-food labels, such as Fair Trade or Rainforest Alliance (Lang 2012; Morgan et al. 2008).

Collaborative multi-stakeholder initiatives appear to have a wide range of functions from advising government bodies, to supporting local projects or developing industry partnerships. It is a common practise and sometimes required through law for governments to get advice from a variety of different agencies, expert groups or advisory bodies. At the same time, collaborative platforms can, in the words of Jasanoff, a key thinker in this area, "*offer a flexible, low-cost means for government officials to consult with knowledgeable and up-to-date practitioners in relevant scientific and technical fields …*" (Jasanoff 1997, p.1).

Collaborative groups not only play a role in advising governments but can also foster dialogue and knowledge exchange between actors in the food system. It is interesting to observe that from a food industry perspective collaboration is gaining more significance, as it can help to strengthen relationships between supply chain stakeholders (Azevedo et al. 2018). Actors along the food chain also seem to be more engaged in collaborative activities, share knowledge and best practise as a response to the rising complexity of food sustainability challenges and the high level of uncertainty. This complexity has developed since the classic state-production based model of food policy has been challenged through a number of factors, such as uncertainties concerning public and environmental health (Spaargaren et al. 2013).

Despite the emergence of collaborative food related multi-stakeholder platforms in the food system, little is known about the internal activities and their role in food sustainability. A brief exploration of different stakeholder platforms in the food system reveals their desire to function as a knowledge and learning forum. Little is known about the knowledge they produce and what role that knowledge plays in food sustainability. The involvement of government stakeholders suggests that food sustainability relevant policies might be particularly impacted and shaped by knowledge from collaborative

platforms. In a world and society that is getting more complex, today's policy and decision makers are more than ever required to justify their policies through knowledge that appears to be independent and scientifically proven or socially accepted. Both the growing complexity of certain policy fields and the rise of strong ideological confrontations in policy making have led to a demand of authoritative and 'neutral' knowledge. Wynne elaborates on the critical understanding of this authoritative knowledge in policy arenas. He argues that in policy domains such as the environment, 'neutral' knowledge itself is not only used to apply normative principles to policy, but is also reshaped in what is regarded as 'neutral' knowledge (Wynne 1992). It is therefore important to have a clear understanding of the source of 'neutral' and independent knowledge in policy making.

The findings from this research help to fill this gap and help to understand collaborative platforms and their role within food sustainability. This research was based on a qualitative exploration of two food related collaborative platforms that work within food sustainability. The first collaboration, The Product Sustainability Forum (PSF) is UK-based and primarily engaged on national level, whereas the second collaboration, the European Food Sustainable Consumption and Production Roundtable (SCP Roundtable), has an EU focus with interests in European food sustainability. The exploration of these two distinct collaborations has also allowed for a comparison between food related collaborations in the EU/UK and how they address food sustainability challenges. This research was motivated by questions of how stakeholders learn and transfer knowledge collaboratively, what kind of knowledge they see as relevant and what impact that knowledge has on food sustainability.

This chapter provides a short introduction to the role of collaborative multi-stakeholder platforms within the food system and food sustainability. More specifically, this chapter sets out the complex nature and difficulties surrounding this research.

1.1 The many faces of sustainability

The term ‘sustainability’ can have different meanings to different stakeholder groups. In the eighteenth century sustainability was referred technically to a specific way of long-term forest management in Germany. Sustainability has moved on from that understanding and has evolved towards a ‘buzzword’ that is debated in academia, policy and industry. Historically this began with the environment movement in the 1960s and 1970s where stakeholders were engaged in questions around environmental issues, global economic growth and development. In the 1980s and 1990s, sustainability was seen as a core concept for what had become a movement bringing together a broad spectrum of stakeholders from academia, government, industry and civil society. This shared interest took different forms, with some engaged in political solutions, while others saw the need to focus more on technical innovations or managerial attention. During that time sustainability initiated a momentum of policy change resulting in historical events such as the 1992 UN Conference in Rio on Environment and Development (UNCED) or the more local and community-based Agenda 21 which understood sustainability as a bottom up approach. From the first concepts of sustainability in 1980 to the present, the majority of definitions of sustainability entail the three Brundtland pillars, namely environmental, social and economic (Moladan 2012).

There are and have been many different definitions and understandings of sustainability. For some it is simply another word for the environment. For others, sustainability goes beyond the environment and is more. For some, it is about nature; for others, the degradation of nature needs to be linked to the actions of humans and the economic structures which drive development. Some take this further, arguing that sustainability becomes a different vision for the role of science and technology – their ‘greening’ rather than continued unleashing. Yet others stress not the economic or environmental, but the societal dynamics which shape the lack of sustainability. From each of these perspectives, a certain mix and overlap of how sustainability and its challenges are conceived inevitably determines not just what the solution is but where

solutions are located. If sustainability is the finding of solutions to problems that are caused by human actions and technology, further actions and technological advancements could, of course, cause more problems.

These broad, philosophical perspectives on sustainability are all reflected in the literature on food. Scholars from diverse disciplines have provided insights into what sustainability means in a food context (Aiking and De Boer 2004; Lang et al. 2009; Garnett 2013; Vallance et al. 2014). The following sections therefore summarise in in more detail the different understandings of sustainability, the notion which is so central to the terrain of this thesis. Collaborative hubs created in the name of sustainability are locations where different interests and perspectives are made real.

1.1.1 The historical background to sustainability

Tensions in what is meant by sustainability are nothing new and have existed throughout the last three centuries. The Industrial Revolution from the 18th century can be regarded as a starting point at which Western intellectuals started to think critically about the relationship between humans, nature and environment (Mokyr 2018). While Marx argued it was primarily a shift in class relations, others stressed the role of individualistic Protestantism as opening up the possibilities. Whatever the various historical explanations, before people's eyes a massive transformation of natural resources emerged based on new uses for and exploitation of coal, water and air on a mass scale. The environment was literally mined. This changed human life and how society worked – new jobs, new products, new possibilities. Goods began to be produced in factories rather than via individual craftsmanship. New patterns of consumption became possible and systematic large-scale working patterns in factories changed the labour process and created a new working class (Thompson 1968). The consequence was that within a few decades from the end of the 18th century into the mid-19th century, new industrial and factory settings replaced rural forms of employment and resources. The era in which agricultural land was the main source of wealth was superseded by a system in which economic prosperity was more urban and could exploit rather than maintain what today we call ecosystems. Today, the food

system and its actors are having to address the long-term consequences of those shifts from the rural to the urban, from the artisanal to the factory, and the emergence of mass degradation from industrialisation. (Mokyr 2018; Bowen and Gleeson 2019). This is not to say that prior to industrialisation, food was 'pure' or without troubles. As Lang and Heasman note, the adulteration of food is recorded over centuries (Lang and Heasman 2015), and both the scale and pace of change in how food was produced, processed and sold changed. From the mid-20th century, scientists documented with rising concern the effects on human and ecosystems health (Nestle 2002; Rayner & Lang 2012).

These changes in the food system were, in evolutionary terms, rapid yet took place over a century or more, as coal and then oil replaced human and animal power on fields. Throughout the 19th century and even more in the 20th, technological advancements rapidly industrialised the way food is processed and produced. These changes were commented upon, and at times sparked strong reactions. Towards the end of the 20th century, for example, public concerns ranged from the exploitation of labour to the state of animal welfare, from the emergence of low nutritional foods to the heavy toll of diet-related health issues (Lang, Barling & Caraher 2009). Counter positions were argued for: fair trade, better animal rearing practices, 'real' food and diet-related health improvement. That consumers have become highly sensitive and concerned about those developments and dependencies, means that both politicians and the food industry have come under pressure to act and to be seen to do so. The most recent such contestation is the massive and routine use of plastics in the food system.

For some, the breadth of these concerns means that the term sustainability has become a code for controlling the worst manifestations of such problems (Misso and Varlese 2018; Kreisel 2018). The knowledge hubs which are the subject of this thesis can be placed among the many forms of reaction to such movements of public and political concerns. Collaborative platforms and knowledge hubs aim to bring actors and their knowledge together in a joint recognition of the 'big picture' about food and the environment and accepting the food system's environmental impacts. Such platforms

are not the sole solution in addressing some of those sustainability issues, as stakeholders have often different views on the magnitude of certain problems.

Even though this research has focused on the modern understanding of sustainability, it is important to recognise that the arguments started at least two centuries ago due to recognition of the harm caused by pollution, smoke, the demolishing of nature and negative impacts on human life and health (Sayer 2002).

1.1.2 The modern meanings of sustainability

Th wider perspective sketched above is critical as it helps situate the modern arguments about sustainability. To most analysts, the modern notion of sustainability begins with the 1987 report of the World Commission on Environment and Development, commonly known as the Brundtland Commission (Brundtland Commission 1987). This was set up under the auspices of the United Nations (UN), as a large-scale review about the future and global challenges. Dr Gro-Harlan Brundtland, a doctor and the first woman Prime Minister of Norway, was asked to consider whether the narrow economic approach to development needed to be broadened and redefined by an environmental perspective. The Commission outlined the now famous three-headed approach to sustainability – that sustainable development requires equal emphasis on economics, environment and society, and that sustainability lies in their overlap. All three policy areas require equal attention for the good of future generations. The Brundtland Commission succinctly defined sustainable development as a "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*" (Brundtland Commission 1987, p.41).

The Commission pointed to two important issues ahead:

1. *The concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given and;*

2. *The idea of limitations imposed by the state of technology and social organisation on the environment's ability to meet present and future needs.*

(Brundtland Commission 1987, p.41)

From this first global report, today's vast sustainability movement and 'industry' draws its legitimacy. The sustainability perspective can be and is applied to almost anything in the world of food. There are sustainable food cities, sustainable diets and sustainable food business models, all of which have their own understanding of sustainability. The success of the sustainability critique has meant it is 'translated' disciplines from business to health, from botany to transport, from environmental studies to social science and food studies (Scoons 2007; Kuhlman and Farrington 2010; Rau and Fahy 2013).

Some have argued that the term 'sustainability' is in danger of being to all-encompassing that its specificity is lost. By becoming mainstream, it is starting to be meaningless and confusing (Aiking and De Boer 2004; Rogall 2008). The environmentalist Bill McKibben even wrote an opinion article for the New York Times in 1996 stating that sustainability has become a 'buzzless buzzword' failing to catch the mainstream society as it become unclear for many what sustainability means (McKibben 1996). One critic argues that the term sustainability is a superficial term "*that mask(s) ongoing environmental degradation and facilitate business-as-usual economic growth*" (Caradonna 2014, p.2). Campaigners easily label actions they do not like as 'greenwash', actions which offer superficial environmental gain but lack substance, such as removing plastic bags from the check-out while selling almost all food wrapped in plastic.

While noting such realities, other scholars maintain the value of the term sustainability. While complex, it has the capacity to become meaningful depending on how it is used. What matters is how it is used, not the term itself. There can be sloppy or tight application. According to Sage:

> *"… sustainability is fluid and relational, contested and complex, and above all locally specific. It is a term that is said to be socially constructed, meaning it can be used by different people, in different ways, to represent different things. However, that does not*

make it worthless, but rather demands that we make explicit what it is we wish to sustain" (Sage 2012, p.290).

Even though there is the demand for more explicit definition, many authors are still vague about the meaning of sustainability. It is almost as though this lack of detail and specification is its value; the value is the vagueness. Barry, for example, outlined that "*the core concept of sustainability is (…) some X whose value should be maintained, in as far as it lies within our power to do so, into the indefinite future. This leaves it open for dispute what the context of X should be*" (Barry 1999, p. 101).

Similarly, scholars such as Leach at al. emphasise that it is not enough to demand a clarification of what sustainability means. For them it is more about the impact of sustainability on people and the values that comes with certain types of substantiality. They argue that:

> *"(…) that broad calls for integration need to be underpinned by finer-grained attention to what sort of sustainability and development are being pursued, for whom and how, and what this implies for improved stewardship of our planet" (Leach et al. 2012, p. 5)".*

This also means that more fundamental questions around justice and socio-political impact need to be addressed by decision makers that aim to implement sustainability (Leach 2012). A definition by Sutton shows that sustainability can be applied to a system or elements and activities within that system. For him:

> "a sustainability issue arises whenever a valued system, object, process or attribute is under threat. The existence of the valued system, object, process or attribute could be threatened or its quality could be threatened with serious decline. In other words there is a sustainability issue whenever there is something that is valued that faces the risk of not being maintained" (Sutton 2004, p.2).

Other researchers side-step the intellectual arguments about the meaning of sustainability by simply pointing to practical issues where actions could deliver improvements. According to Gibson:

> *"Sustainability is 'a multidimensional integrative concept. Among other aspects, sustainability links the human and bio-physical, present and future, local and global, active and precautionary, critique and alternative vision, concept and practice, and universal and concept-specific. In addition, proper sustainability implementation engages together participants covering the full range of public, corporate and civil society organisations and institutions, as well as individuals with their various capacities and inclinations" (Gibson 2006, p. 262).*

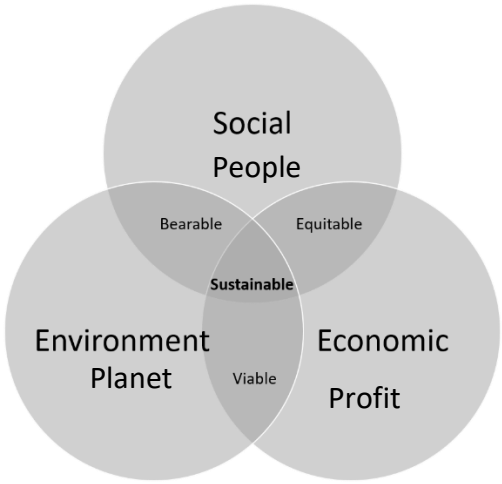
The term ‘development’ is used by some scholars as a circumstance of progressing and ‘leading up’ to the desired objective to be sustainable (Waas et al. 2011). On the other hand, the term ‘sustainable development’ can also be negatively associated with colonial thinking and ‘helping’ under-developed regions that are mainly in the global south. This view is particularly represented by various organisation of the UN (Banerjee 2003; EAC 2004). Even though in some cases the terms ‘sustainable development’ and ‘sustainability’ are used equivalently and almost ‘like-for-like’ (Dolan *et al* 2006a; Adger and Jordan 2009). This aspect can be important for this research as the members of collaborative platforms might refer to the ‘development’ element of sustainability without mentioning the term and vice versa. Especially since some food related collaborative platforms can include a diverse range of stakeholders, such as NGOs who might have a specific understanding of the term ‘sustainable development’ compared to the meanings for other stakeholder groups.

For Brundtland, it must be remembered, sustainability is the outcome of the equal alignment of the ‘three pillars’ economy, society and environment (Moldan 2012). So central is that argument that, at times, the three pillars almost assume a ‘neutral’ status, as though it has universal approval and acceptance. Even government stakeholders use this definition. For the Parliamentary Office of Science and Technology sustainability is “*the long-term maintenance and enhancement of human wellbeing within finite planetary resources. It is usually considered to have environmental, economic and social dimensions*” (Parliamentary Office of Science and Technology 2012, p.1). In fact, the three pillars approach was introduced by Brundtland to provide some order to the debate about global inequality and uneven development (parallel to the Brandt Commission created by the UN at the same time (Brandt 1980). Initially, in the late 1980s and early 1990s, even Brundtland’s attempt to provide a new policy consensus and framework was found by business interests to be too ‘political’, aspirational and threatening. But once Brundtland’s attention on sustainability as the area where all three sectors overlap ‘equally’ (see Figure 1.2) was translated into business language in 1994 as the ‘triple bottom line’ by John Elkington, a British sustainability consultant, much of the business opposition began to melt away (Elkington 1998; Elkington 2019).

Sustainability could be a new business opportunity and / or a new framework for how to do business.

This sought to incentive business to use measures and indices and to set targets. The proposition immediately found favour, not least because it seemed to propose that the profit motive could still be the driver. Elkington's People, Planet and Profit became the three concepts through which business could approach and feel comfortable in delivering sustainability. It has become core to Corporate Responsibility approaches (Slapper and Hall 2011).

Figure 1.2 Sustainability as the point where Environment, Economy and Social factors meet



Source: Own figure after James 2014

If business had difficulties with adopting sustainability into its thinking, so did academia, where arguments continue. Scholars such as Morelli argue that researchers and professionals have been trying to bring meaning to the term sustainability through their own disciplines resulting in a different emphases, definitions and meanings all existing in parallel (Morelli 2011). An example for this is the definition of environmental sustainability. Some scholars argue that it is important to make a clear distinction between social, environmental and economic sustainability. For Goodland and Daly, environmental sustainability is for itself a separate area and they suggest:

> *"… to focus the definition of environmental sustainability (ES), partly by distinguishing ES from social sustainability and from economic sustainability. The challenge to social scientists is to produce their own definition of social sustainability, rather than load social desiderata on to the definition of ES. Similarly with economic sustainability; let economists define it or use previous definitions of economic sustainability. The three types of sustainability-social, environmental, and economic-are clearest when kept separate" (Goodland and Daly 1996, p. 1002).*

In comparison to that researchers such as Rau and Fahy argue that there is a need to regard sustainability from a multidisciplinary ankle rather than individual disciplines. For them:

> *"a commitment to interdisciplinarity is often seen as a necessary precondition for successful sustainability research: it is much less clear what this type of research is expected to look like and what onto logical, epistemological and methodological foundations it is supposed to rest upon"* (Rau and Fahy 2013, p.11).

At the same time, a key problem with the interdisciplinary sustainability research is that there are significant barriers due to the significant differences of how the term sustainability is used and understood across different disciplines. This makes it in turn difficult in the research progress to apply an interdisciplinary approach on sustainability (Rau and Fahy 2013).

To summarise so far, we can note that although the Brundtland definition remains pivotal and highly cited, it is possible to identify further definitions over time (see table 1.1). While most of these definitions inherit some of the key elements of Brundtland, it is noticeable that none is trying to be precise and specific in what the term 'sustainability' entails. Most appear to be universal, but at the same time they retain some vagueness.

Table 1.1 Selected definitions of 'Sustainable Development'

1980	*"Human beings, in their quest for economic development and enjoyment of the riches of nature, must come to terms with the reality of resource limitation and the carrying capacities of ecosystems, and must take account of the needs of future generations. That is the message of conservation. For if the object of development is to provide for social and*	(IUCN *et al* 1980, p. I)

	economic welfare, the object of conservation is to ensure the earth's capacity to sustain development and to support all life".	
2002	*"Sustainable Development is perhaps the most challenging policy concept ever developed. Its core objective – a kind of ethical imperative – is to provide everybody everywhere and at any time with the opportunity to lead a dignified life in his or her respective society".*	(Omann and Spangenberg 2002, p.2)
2003	*"Current norms for Sustainable Development have emerged within a particular historical context, which is the modern capitalist notion of the business corporation operating within a Judaeo-Christian ethical framework".*	(Banerjee 2003, p. 169)
2005	Sustainable Development cab be described as "*a concept that, in the end, represents diverse local to global efforts to imagine and enact a positive vision of the world in which basic needs are met without destroying or irrevocably degrading the natural systems on which we all depend*".	Kates *et al* 2005, p.20)
2008	Sustainable Development is an "*intellectual perspective which sees the environment as the infrastructure of life; proposes ecology as the science to help unlock the interconnectedness of existence; takes long time horizons when making present decisions; centres on the local but takes a global geographic framework for events; situates human activity within millennia of planetary development; is conservative about the use of energy; celebrates and supports bio and social diversity; and, in theory, is mindful about international justice when allocating and using resources*".	(Lang 2008, p.292)
2013	Sustainable Development should "*simultaneously protect human wellbeing and life-supporting ecosystems in ways that are socially inclusive and equitable*".	(ISSC 2013, p.5)

Certainly, with the Rio conference in 1992, sustainability became present at the global political stage and centred around global environmental issues such as climate change, biodiversity and desertification. Stakeholder groups such as the International Institute for Environment and Development or the World Resource Institute became visible and recognised in policy debates concerning issues on sustainable development. A result from these debates was that sustainability moved from theory to practise and:

> "*the result was an exponential growth in planning approaches, analysis frameworks, measurement indicators, audit systems and evaluation protocols which were to help governments, businesses communities and individuals make sustainability real*" (Scoones 2007, p. 592).

More recently, Rau and Fahy argued that the focus on measuring sustainability through technical practices may have practical advantages, but it can also lead to a disregard of social and cultural elements of sustainability (Rau and Fahy 2013). Other scholars such

as Balkau and Grant argue that measuring and assessing sustainability can be useful for the society and policy makers. They state that:

> "Measuring sustainability, and in particular environmental sustainability, using different tools could be a valid action to provide a basis for the public and policymakers, both governments and non-governmental organizations, for defining objectives and targets useful to rethink our current lifestyles and the patterns of human welfare" (Balkau and Grant 2018, p. 47).

Even though the Brundtland definition of sustainable development is the most frequently used definition, it is also a very broad and vague definition. It has its critics. Emas, for instance, argues that this definition does not specify the sustainability element. For her:

> "*the overall goal of sustainable development (SD) is the long-term stability of the economy and environment; this is only achievable through the integration and acknowledgement of economic, environmental, and social concerns throughout the decision making process."* (Emas 205, p.2).

This criticisms in fact captures a feature which is central to many who use the language of sustainability over the years, namely that sustainability points to an active process of development from a state of affairs which is deemed 'unsustainable towards one which aspires to be sustainable. This, as will appear in the present research, is a key feature of the knowledge sharing processes studied in this thesis.

Environmental and ecological sustainability

In May 1986 at a public hearing during the World Commission on Environment and Development, the former Canadian minister of the environment, Charles Caccica posed the question: "*How long can we go on and safely pretend that the environment is not the economy, is not health, is not the prerequisite to development, is not recreation?*" (UN 1987, p. 36). That he asked this question shows that, even early in the modern debates, there was a strong belief that the environment is the crucial challenge to resolving how humans could live and interact optimally. It also shows that there was a disconnection between environmental issues and other aspects of life such as economy or health. Lang and colleagues point out the irony that Dr Brundtland, a public health

doctor, gave so little attention to health in her three-pronged approach (Lang et al. 2009).

In the world of practical politics, such as the European Union, the term sustainability has been mostly understood as environmental sustainability (Moldan 2012). Even at the 2001 Gothenburg summit of the European Union's Sustainable Development Strategy, four out of six main objectives focused primarily on environmental sustainability. Policy makers started to see environmental sustainability as a global issue only in the 1970s and some even say that the Brundtland Report "*did give birth to the notion of 'environmentally sustainable development' and it triggered a series of global gatherings and negotiations aimed at giving substance to this headline concept*" (Mulligan 2017, p.3). The most commonly cited areas of environmental sustainability are climate change, clean energy, conservation and the management of natural resources and biodiversity.

In some respects, the focus on the environment can help spread environmental thinking across the professions and disciplines. But on the other hand it also limits what is meant by sustainability. For Goodland and Daly, environmental sustainability is difficult to measure but nonetheless they supply an almost technical outline of their understanding of environmental sustainability. For them the centre of environmental sustainability evolves around ecological capital:

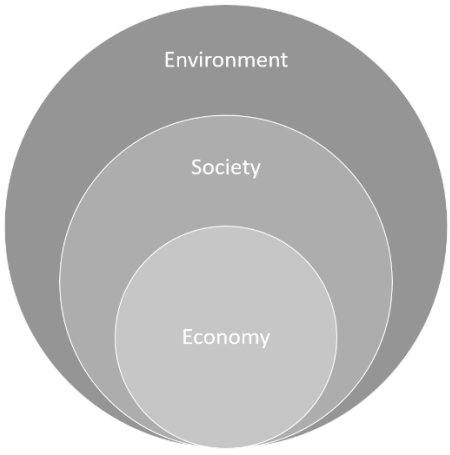
> *"The fundamental definition of environmental sustainability is contained in the input-output rule as follows: Output Rule: Waste emissions from a project should be within the assimilative capacity of the local environment to absorb without unacceptable degradation of its future waste-absorptive capacity or other important services. Input Rule: (a) Renewables: harvest rates of renew- able-resource inputs should be within the regenerative capacity of the natural system that generates them. (b) Non-renewables: depletion rates of non-renewable-re- source inputs should be equal to the rate at which renewable substitutes are developed by human invention and investment. Part of the proceeds from liquidating non-renewables should be allocated to research in pursuit of sustainable substitutes" (*Goodland and Daly *1999, p. 1008).*

Sutton took the approach to define a 'basic' definition of environmental sustainability which should be used as a foundation by others when working on environmental sustainability issues. For Sutton:

> "*environmental sustainability is the ability to maintain things or qualities that are valued in the physical environment*" and adds that "*… people using the term environmental sustainability can specify or elaborate the term further to add extra meaning or to apply the concept to more specialised contexts*" (Sutton 2004, p. 1).

This view on environmental sustainability is interesting as it acknowledges the complexity of sustainability, while emphasising that sustainability becomes meaningful through usage and context, a feature championed by scholars such as Sage (Sage 2012). At the same time, it should be noted that the notion of sustainability has been given more uneven attention by some users. For example, Victor, an economist, emphasises that the economy and society cannot exist without the environment and that later should be prioritised when working on sustainability (Victor 2008, Caradonna 2014).Figure 1.3 represents this unevenness, with the economy given a more fundamental priority, but equally one could make the environment or society more central. The point is that, over time, biases have been applied to Brundtland's balanced model.

Figure 1.3 Environmental sustainability and its fundamental position



Source: Own figure based on James 2014

Sustainability in business and economy

As was noted above with the concept of the 'triple bottom line', the case for sustainability has become important for businesses. This is not just for profitability but

for reputation and brand protection. According to some analysts, the pursuit of sustainability can bring businesses advantages such as higher stock value, cost savings, enhanced competitiveness, image and reputation (Landrum 2018). While 'pure' ecologists defended sustainability as the ability of a biological system to 'bounce back' from a shock or stress through adaptation, economists who tried to bridge ecology and economics found this both too vague and too rigid. They wanted a more concrete and practical understanding of sustainability. The development of methods such as life cycle analysis and footprint analysis have provided means to bridge price and ecosystem viability (Scoones 2007).

In the practical world of business, the concept of a life cycle analysis or assessment (LCA) has become particularly powerful and widely used. It proposes that a product or service can be analysed for any environmental (or social) impacts during its 'life' (Saunders 2008). LCA has become commonly used in the food system. For example, the environmental impact of water use in beef production can be calculated from birth of the animal to when it becomes a consumed product. LCA offers a technical way of assessing environmental aspects down food supply chains. It often used to assess the level of sustainability of a specific product or service. Another approach is to calculate the ecological footprint (EF) of a product. The EF can be described as a concept that:

> *"… measures the total area of biologically productive land and water ecosystems, expressed in global hectares (gha) per capita (…) required to produce the consumed resources and to assimilate the emissions (CO_2 sequestration) produced by a given population* (Balklau and Grant 2018, p. 49).

The LCA and EF illustrate a very technical approach in defining, measuring and assessing sustainability and some of those 'tools' appear to even have become the 'golden standard' for some government and industry stakeholders (Bell and Morse 2013; Baklau and Grant 2018). They provide ways for business and policy makers to apply the rubric that unless one can measure something, one cannot affect or change it.

Fairly quickly after Brundtland, the term sustainability was taken to imply a trade-off between environment and economic prosperity. The modern business truism is that

there is little pointing going 'green' if it puts your company into the 'red'. For some scholars, such thinking is both trite and out-dated as improvements environmentally can promote innovation and economic profit. Porter and Linde, for example, theorised that pollution reflects an ineffective use of resources and therefore an ineffective economy. The improvement of the environment is therefore linked to economic gains that result in a 'win-win' situation (Porter and Linde 1995). Environmental policies that take economic gains seriously can utilise market incentives to promote production processes that reduce pollution. The argument is that market-based environmental tools can be more effective by being pro-business than by being state imposed regulations (Emas 2015).

Sustainability, in this respect, is a natural topic for business and economics since a core concern of economics is the management of resources, goods and services in a complex and changing world. In 1798 Thomas Malthus had proposed the correlation between global mass starvation and the depletion of resources (limitations of agricultural land and the limitations of global food production) (Kuhlman and Farrington 2010, Malthus 1817). In this respect, 'triple bottom line' thinking is simply an update "*because companies are "for profit," they are required to ensure their bottom lines are healthy enough to allow them to continue operating*" (Williard 2012, p.4).

It is little wonder that corporate approaches to sustainability remain both topical as well as contested. According to Dyllick and Hockerts more businesses now include a level of eco-socio-efficiency and sustainability objectives in their strategies. They claim that corporate sustainability entails the six criteria eco-efficiency, socio-efficiency, eco-effectiveness, socio-effectiveness, sufficiency and ecological equity. Despite sustainability being translated into management language like this, they point out that managers are still reluctant to acknowledge the correlation between their business actions and the impact on sustainability (Dyllick and Hockerts 2002). On the basis of the Brundtland definition Dyllick and Hockerts define corporate sustainability as:

> *"meeting the needs of a firm's direct and indirect stakeholders (such as shareholders, employees, clients, pressure groups, communities etc), without compromising its ability to meet the needs of future stakeholders as well"* (Dyllick and Hockerts 2002, p.131).

In practice this means that when corporate businesses aim for economic growth and capital gains, they can also seek to actively contribute to sustainability. Some critics see this as potentially creating a tension between sustainability and the daily pressure of making short term gains and a neglect of long term strategies. The hard reality is that businesses can be exposed to the volatile stock market and the relentless pressure to deliver good quarterly financial returns. The ability to plan for the long-term and not only from quarter to quarter is significant for developing and employing sustainability strategies (Dyllick and Hockerts 2002; Amess et al. 2016; Furrer 2016).

In the corporate world, sustainability can mean a differentiation is made between three forms of capital: economic, natural and social. Economic capital can be described as forms of assets that a business owns, such as financial capital (i.e. equity, debt), tangible capital (i.e. machinery, land, stocks) and intangible capital (i.e. reputation, inventions, know-how). Natural capital is the natural resources that are used and impacted through corporate consumption. These can be differentiated into either renewable (i.e. wood or fish) or non-renewable natural capital (i.e. fossil fuels or soil). Social capital can be described as assets within the human world. Social capital is divided into human capital (i.e. skills, motivation, loyalty of employees) and societal capital (i.e. quality of public services, quality of the educational system and entrepreneurship) (Balabanov et al. 2015; Dyllick and Muff 2016; Kocmanová et al. 2016).

This more economic perspective on sustainability is highly relevant to the research reported here which investigates industry-led food-related collaborative platforms. A contrast can be drawn to traditional economic theories which assume that all forms of capital are replaceable by investment of economic capital. Modern corporate sustainability rejects the notion that all can be reduced to finance. Non -renewable capital such as soil cannot be replaced by economic capital (Dyllick and Hockerts 2002).

Social sustainability

Of the three pillars (economic, social and environment) of sustainability, the social pillar has probably been the least well theorised (McKenzie 2004; Colantonio 2007; Bitsch 2010; Bostrom and Klintman 2014). For years, the social aspects of sustainability were not given the attention that one might have expected after the Brundtland Commission. Literature and even political attention tended to focus on environmental aspects of sustainability. Recently, however, social sustainability has begun to win more attention (Barling et al 2010; McKenzie 2004; Redclift 2000). Dempsey and colleagues have suggested that even though the social dimension is "*widely accepted, exactly what this means has not been very clearly defined or agreed*" (Dempsey et al. 2011, p.289). In fact, a number of concepts have become important, such as social capital, social cohesion, social inclusion and exclusion (Dempsey et al. 2011; Hopwood et al. 2005; Litting and Griessler 2005). Some scholars even argue that the social dimension of sustainability has been systematically neglected by academics as they have predominantly focused on bio-physical environmental issues. According to Vallance et al. this has resulted in social sustainability being a concept that is in some chaos (Vallance et al. 2011). Despite this critique, other scholars see real value in the term 'social sustainability'. For Colantonio and Dixon social sustainability describes:

> *'how individuals, communities and societies live with each other and set out to achieve the objectives of development models which they have chosen for themselves, also taking into account the physical boundaries of their places and planet earth as a whole' (Colantonio et al. 2009, p.4).*

This definition of social sustainability sees an emphasis on communities and on activities that lead to certain goals within development models. As with other definitions of sustainability reviewed here, Colantonio et al. argue that social sustainability too can be generic and vague. A more recent, positive and specific description of social sustainability has been given by Bostrom and Klintman for whom the social dimension of sustainability should focus on:

> *"social welfare, quality of life, social justice, social cohesion, cultural diversity, democratic rights, gender issues, workers' rights, broad participation, development of*

social capital, individual capabilities and the like. It refers to substantive and procedural issues, such as inclusive, transparent and democratic decision-making" (Bostrom and Klintman 2014, p. 85).

Dempsey et al. suggest that academic research is in fact lagging behind recent developments in policy regarding social sustainability. EU member states have singed the 'Bristol Accord' which includes a common European concept on 'sustainable communities'. These 'sustainable communities' include a number of elements of a sustainable society such as meeting the needs of residents in urban areas and contribute to a high quality of life (Dempsey et al. 2011).

For Vallance, the main problem with existing definitions of social sustainability is that they are predominantly based on the sustainable development definition of the Brundtland Report. For her, even though the Brundtland report provides a number of elements for the social dimension of sustainability, such as meeting the needs for employment, water, energy, sanitation and food, recent research "*has, however, highlighted ways in which practice associated with the concept has failed to substantially improve the condition of the poor*" (Vallance 2011, p. 343). Much work on social sustainability has occurred in less-developed countries and focussed on essential needs which leads some to question how these concepts are applicable in developed countries (Bramley and Power 2009). Vallance proposed a more appropriate approach to social sustainability as a focus on "*inter and intro-generational equity, the distribution of power and resources, employment, education. The provision of basic infrastructure and services, freedom, justice, access to influential decision-making fora and general 'capacity-building' …*" (Vallance 2011, p.33). But why should this not also apply in developing countries?

Colantonio, Magis and Shinn provide a different focus by considering the relevance of social sustainability for an individual. Echoing the humanist psychologist Abraham Maslow, they propose a transition up a hierarchy of needs. Once basic elementary needs are fulfilled such as food and shelter, that individual is likely to demand more advanced

social elements, such as empowerment or political participation (Colantonio 2007, Magis and Shinn 2009).

Social sustainability can also be viewed from a corporate and economic perspective through the concept of 'Corporate Social Responsibility' (CSR). The Commission of the European Communities states that CSR

> "*is about companies having responsibilities and taking actions beyond their legal obligations and economic/business aims. These wider responsibilities cover a range of areas but are frequently summed up as social and environmental where social means society broadly defined, rather than simply social policy issues" (Dahlsrud 2006, p. 3)*.

Dahlsrud meanwhile has suggested there are at least 37 definitions of CSR and concluded even though most of these 37 definitions are fairly similar and congruent they do reflect biases towards specific interests as the corporate world comes under pressure to improve its CSR performance (Dahlsrud 2006).

1.2 Food and sustainability

How does this dissection of the various variations in the meaning of sustainability fit the world of food? It is challenging even to try to define the term 'food sustainability'! Even authors who aim to explore the term appear to avoid a specific definition. Pragmatically, it might even be realistic simply to avoid trying to find a common and universally accepted definition, and simply to accept – as for the term sustainability itself – that food sustainability means different things to different people, or that it shows how diverse and complex food sustainability is (e.g. Lawrence et al. 2010; Oosterveer and Sonnenfeld 2012; Marsden and Morley 2014). Oosterveer and Sonnenfeld argue that sustainability can be understood simply as improving ecological, economic and social circumstances of the present and future generations and that "*no unanimous understanding of what sustainable food provision entails has yet been reached*" (Oosterveer and Sonnenfeld 2012, p.250-251). It should also be remembered that

elements of what we now see as the challenge of food sustainability has been explored without even using the term 'sustainability'. Malthus' treatise on the relationship between population and food production or Carson's Silent Spring exploring the impact of agricultural pesticides on the fauna are two examples of seminal works which didn't use the term (Malthus 1817; Carson 1962).

Nevertheless, food sustainability is in use. Table 1.2 provides an overview of some key definitions of 'food sustainability'. Most of them appear to acknowledge the 'three-pillar' perspective.

Table 1.2 Selected definitions of food sustainability

1993	*"Sustainable agriculture needs to be focused, centrally, on meeting human needs, which are consumptive (food, water, fuel), protective (clothing, shelter), and regenerative (dignity, self-determination and freedom from exploitation). These needs need to be met for current and future generations. In other words, sustainable agriculture should maintain the ecological conditions of production and provide the means for everyone to live and work with dignity, including securing adequate, safe food. This in turn is predicated on developing non-exploitative relations of race, class, gender and nation"*.	Allen and Sachs 1993, p. 159
2000	Sustainable agriculture can be defined as ecologically sustainable; knowledgeable/ communicative; proximate; economically sustaining; participatory; just /ethical; sustainably regulated; sacred; healthful; diverse; culturally nourishing; seasonal / temporal; value oriented; relational	Kloppenburg et al 2000, p. 178
2002	A sustainable food system can be 'more environmentally sound, more economically viable for a larger percentage of community members, and more socially, culturally and spiritually healthful'.	Feenstra 2002, p. 100
2008	Sustainability evolves around the need to develop agricultural technologies and practices that: (i) do not have adverse effects on the environment; (ii) are accessible to and effective for farmers; (iii) lead both to improvements in food productivity and have positive side effects on environmental goods and services. Sustainability in agriculture incorporates ideas of resilience and persistence.	Pretty 2008, p.447
2010	Sustainable food system is "*an equitable, viable food system that accounts for social, economic and environmental concerns for citizens in developed and developing countries, rural and urban regions alike"*.	Blay-Palmer 2010, p.6

2012	*"New dietary guidelines will be required, which meld health, environment and other criteria, all of which contribute to a definition of sustainability appropriate for the 21st century*".	Lang and Barling 2012, p.320

For Lang and Barling, the recognition that different policy actors apply different meanings is what matters. Food sustainability means whatever the actors mean. For them:

> *"different interests offer competing analyses [*such as on food sustainability*]. Food 'philosophies' vary. Some emphasise markets, others citizens. Some see the state's role as facilitative, others as oppressive. Some see price as incorporating all values, others as externalising costs that ought to be internalised. Some see food security as about developing countries, others as a challenge to the world's food system in different ways according to level of development" (Lang and Barling 2012, p.321).*

This pragmatic approach accepts the role and utility of different methods to measure and assess the sustainability of food. The most common and known method is the Life Cycle Analysis (LCA), where the environmental impact on each stage of food production is assessed (Aiking and De Boer 2004). Life Cycle Assessment is defined as "*a tool for evaluating environmental effects of a product, process, or activity throughout its life cycle or lifetime, which is known as a 'from cradle to grave' analysis*" (Roy et al. 2009, p.2). Although providing some precision (and numbers), this is gained mostly with regard to environmental impact and can be harder to produce with regard to cultural or social implications, for example.

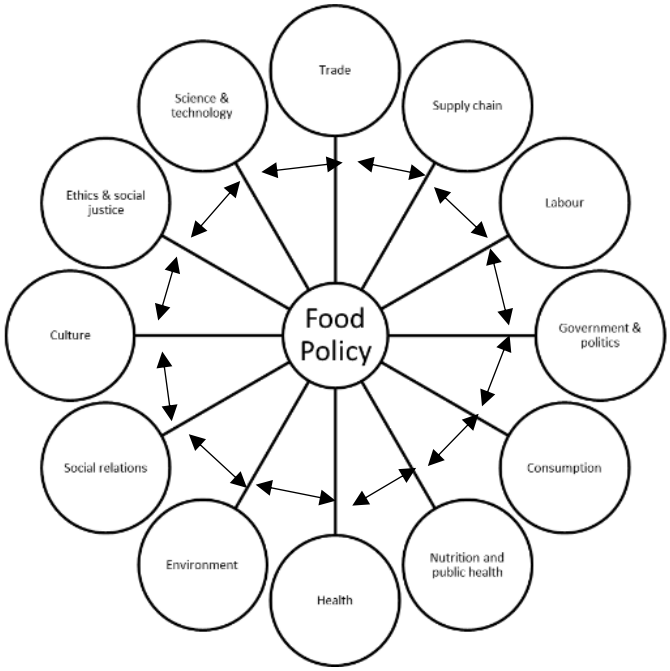
Lang and colleagues earlier proposed a broad understanding of food sustainability as a "*sustainable development [with] […] a world-view, and holistic approach to how society, the economy and culture can be organised to protect planetary health*" (Lang et al. 2001, p.6). Here they proposed that food sustainability includes an interaction between the environment as a material and biological entity, as well as cultural and social elements. The notion of health becomes important (filling the gap they saw in Brundtland). They identified the areas nutrition, health, environment, behaviour, culture, social justice and poverty as key understanding issues around food sustainability. Thompson et al. shared this view and described long-term food sustainability challenges as around hunger and

malnutrition, negative environmental changes, technological limitations for enhancing productivity, increase land degradation, loss of biodiversity, livelihood insecurity and continuing poverty of agricultural communities, food safety, hygiene and nutrition and re-localisation of agri-food systems (Thompson et al. 2007).

Figure 1.4 illustrates the complexity of food sustainability and the presence of competing themes within it. One could argue that there was a classic view on food sustainability as about three areas of agriculture, consumption and trade, but this does not fit the more complex food system of the 21st century where there are long supply chains and where hunger and malnutrition exist alongside obesity and over-supply. Any realistic thinking about sustainability much now address obesity and weight as well as malnutrition and hunger (Aiking and De Boer 2004; Gupta 2004; Lang et al. 2009; Lang and Barling 2012; Sage 2012; Lang and Heasman 2004). Policy, argue Lang and Barling, has failed to catch up with the complexity of reality:

> *"While policy debate about food security is still dominated by a productionist focus, even mainstream 'official' analyses now attempt to address sustainability. Some critics detect here a mere modernising and softening of the image of productionism, suggesting tensions between these new versions of productionism and more radical analyses centred on ecological integration or food sovereignty" (Lang and Barling 2012, p.320).*

Figure 1.4 Food policy and its competing issues



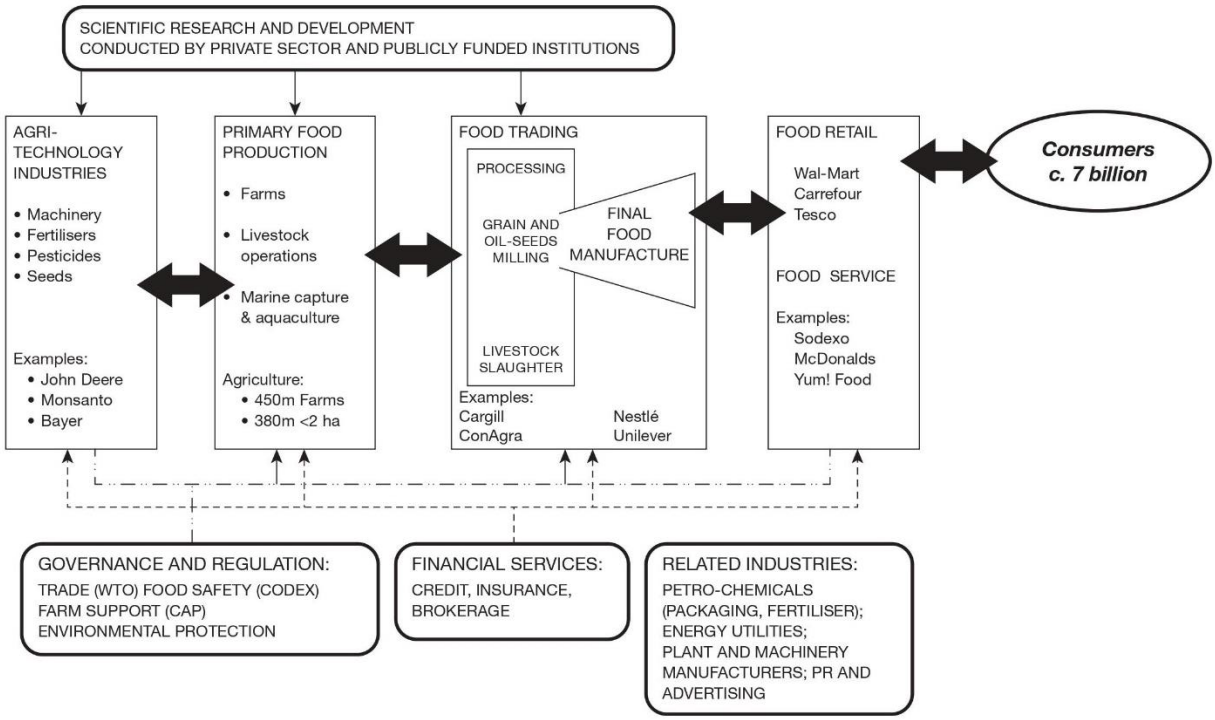
Source: Author after Lang et al. 2009

The problem, of course, is that by becoming more real and more complex, food sustainability has also become increasingly 'messy' and 'blurry', creating a conundrum as there is no single clear field of action. If sustainability is everything, it loses policy 'bite', yet the value of the idea is to bring diverse and complex issues under one umbrella and reflect to policymakers that they need to make these multiple connections. All potential areas of food sustainability are inter-related to each other and have multiple cross-cutting themes, which makes it difficult to develop an overarching and holistic understanding of food sustainability (Lang and Heasman 2004). Particularly in a world where the agro-industrial food system shapes the way food is grown, produced, advertised and consumed, industry stakeholders are likely to play an important role tackling multiple dimensions of sustainability (see Section **Error! Reference source not found.**). Current UN projections of the rural and urban population trends, for example, already accept that more people live in urban areas compared to rural. This has particularly implications for how food is produced and consumed in the future (Thompson 2007; Lang and Heasman 2014; UN DESA 2015).

If a holistic view of food sustainability is taken (as in Figure 1.4) a broad spectrum of actors must be involved. As such, food related collaborative platforms must surely be

multi-stakeholder in their setup or fail before they begin. Collaborative knowledge sharing and learning activities can be an asset to understanding and addressing the messiness and uncertainty within food sustainability. Sage posed this challenge in his schematic overview of the global agri-food system which gave examples of key stakeholders for each component (see Figure 1.5).

Figure 1.5 Schematic overview of the global agri-food system



Source: (Sage 2012, p. 31)

This schematic overview of the global agri-food system offers a farm to fork approach of the five connected components agri-technology industries, primary food production, food trading, food retail and consumers. Here Sage emphasises that, even though the figure appears to be linear, this is not the case as stakeholders and processes in each element of the system operate beyond their boundaries (Sage 2012). Thus, food sustainability affects not only specific segments of the global agri-food system but has overarching implications to other elements. In addition to the five elements, he offers a number of infrastructural industry services and institutions. According to Sage:

> *"these include manufacturers and suppliers of machinery, equipment, materials, energy, advertising and public relations; financial services, providing a range of functions, from the provision of credit and insurance against loss, to fostering more speculative activities such as trading in commodity futures; and "good governance", encompassing the regulation of food standards, from the global level by the Codex Alimentarius through to national food safety authorities" (Sage 2012, p. 30).*

This stakeholder view is highly pertinent to the present research on industry-led collaborative platforms. Food industry actors such as Monsanto, Nestlé or Unilever are key in shaping the global agri-food system; and it appears that collaborative platforms are a 'tool' of the food industry to enhance their activities and influence on the food system through the sharing of knowledge and best-practise. According to Thompson et al.:

> *"today, the system is becoming much more complex, starting with a firm's involvement in (bio) technology, extending through agro-chemical inputs and production, and ending with highly processed food. Increasingly, these firms are developing a variety of different alliances with other players in the system, forming new food system 'clusters'" (Thompson et al. 2007, p. 9).*

It appears that even within food sustainability, industry actors see concerns over environmental problems as mainly (and sometimes solely) related to food production. This perspective in turn excludes other aspects of the food system such as consumer perspectives. Hence Millstone states that 'food security' should be understood "*in far broader terms as encompassing considerations of sufficiency, sustainability, equitable distribution and safety*" (Millstone 2016, p9). Like many modern analysts of the food system, he sees food sustainability as raising questions about power in and over the food chain. The current food system, he argues, is the result of a shift in power away from both primary producers and consumers in favour of processors, traders, retailers and speculators and "*despite the rhetoric of the food retailers and processors that the system is driven by individual consumer choices, large agri-business corporations make the key decisions that impact on both farmers and consumers*" (Millstone 2016, p. 10).

From this perspective, the pursuit of food sustainability exceeds the control of single actors or consumers; nor does it remain within narrow or national political borders. Food sustainability raises such complexity that collaboration across sectors and beyond individual companies is almost certainly required. It raises systemic issues which is why

industry-led collaborations might be one strategy for companies to engage with. At the simplest level, collaboration could give them strength to suggest solutions to sustainability problems. It could also raise problems of unfair commercial advantage or 'pre-competitive' behaviour. Since there is not much known about these food industries led collaborations and their role in the food system, this research has analysed two such collaborations (see the Research Questions in Chapter three).

Sustainability and the value chain analysis

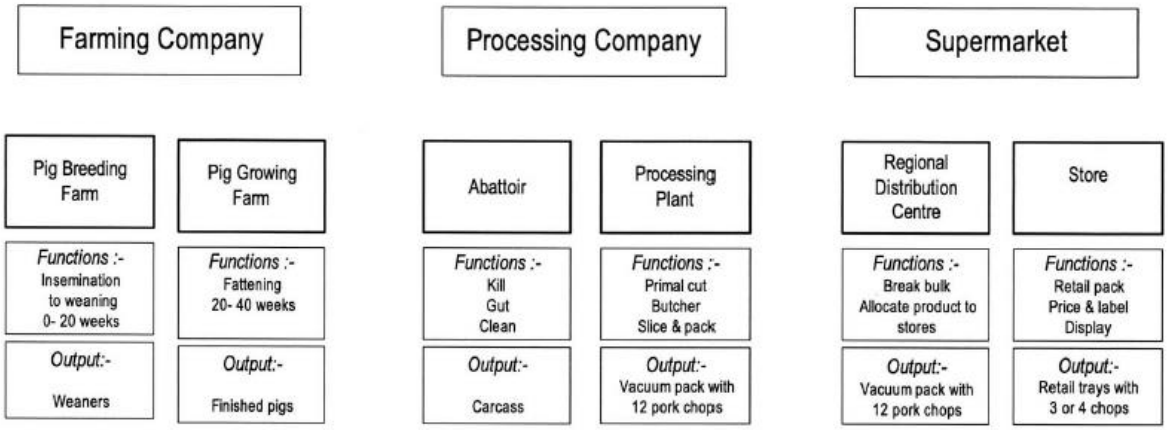
One way to address sustainability is to adopt a value chain approach to food sustainability. Like LCA discussed earlier, value chain analysis (VCA) means viewing "the full range of firms' activities, from the conception of a product to its end use and beyond" (OECD 2013, p. 14). This also includes that activities can be undertaken by a single or several companies concentrated as one or several locations. For Kabu and Tira:

> *"value chain shows the full range of activities that should be taken by companies to bring a product from its conception to its end use and beyond. This includes and starting from all design activities, production, marketing, distribution until final consumers" (Kabu and Tira 2015, p. 151).*

At its simplest, this could be to analyse the product of potato fries sold at a fast food restaurant from a 'farm to fork' perspective. This necessitates assessing the initial raw materials, such as potatoes, oil and salt, the methods of harvesting and processing the potatoes, the preparing and frying of the fries, right to the consumption by the consumer. VCA can be described as a methodology which "*has become an increasingly useful approach to gain a comprehensive view of the various inter-locking stages involved from taking a good or service from the raw material to production and then to the consumer*" (Schmitz 2005, p. iii).

Taylor conducted a VCA of agri-industrial red meat production (Taylor 2005). He saw three elements in the value chain, each with a specific role: the farming company, the processing company and the supermarket, all with their actions and 'output' (See Figure 1.6).

Figure 1.6 Example of a value chain in the food system



Source: Taylor 2005

Over recent decades, global value chains (GVC) have been studied often to try to understand the effect of globalisation and technological advancement (Pritchard and Burch 2003; Gereffi and Stark 2011). A GVC analysis includes tangible and intangible value-adding activities by firms on a global basis across countries. This global aspect of the value chain analysis has implications on the economy and people in developing and developed countries. The global value chain connects companies, good and works across the globe and can provide some developing countries an economic opportunity to be involved in a wider economic context and gain economic advantages through that connection. According to Gereffi and Fernandez-Stark:

> *"for many countries, especially low-income countries, the ability to effectively insert themselves into GVCs is a vital condition for their development. This supposes an ability to access GVCs, to compete successfully and to "capture the gains" in terms of national economic development, capability building and generating more and better jobs to reduce unemployment and poverty"* (Gerefffi and Fernandez-Stark 2011, p. 2).

Developed countries often see an economic advantage in sourcing services and goods from developing countries through global value chains. This has particularly played out well economically for emerging markets such as China and India, as well as export-oriented countries (Gereffi and Fernandez-Stark 2011).

The value chain analysis appears to be a very common approach in academia and industry to research food sustainability from a 'farm to fork' approach. Research that specifically focuses on food sustainability and value chain analysis was carried out by Kabu and Tira on sustainability and the fishery sector in Kota Kupang (Indonesia). The value chain analysis included the mapping of key actors and understand their economic relationship and supply chain activities (Kabu and Tira 2015). Other scholars such as Quiédeville et al. have researched sustainability of the French organic rice value chain (Quiédeville et al. 2018). Munasinghe et al. have conducted a value–supply chain analysis of crude palm oil production in Brazil, focusing on economic, environmental and social sustainability (Munasinghe et al. 2019). This overview on value chain analysis demonstrates that it can be beneficial to map actors and activities from the beginning to the end. The value chain analysis can help to provide a coherent perspective and context when assessing sustainability issues within the food system and its stakeholders.

1.3 Why does food sustainability matter for the food industry?

Within the agro-industrial food system, food industry actors can be seen as key players that shape the food system and its processes. The agro-industrial food system appears to have capabilities in providing safe, mass produced, flavoured and affordable food to a large portion of the globe. This form of thinking was particularly fostered through a time period where it was critical to overcome nutritional deficiencies and disorders that are related to that deficiency. This was particularly communicated to the wider public as governments promoted the consumption of more and greater variety of foods. The reason for this was that in the past the life expectancy was at around 47 and most people died from infections such as tuberculosis and malnutrition weakened the impacted person's immune system (Nestle 2013).

While there were many advantages of the agro-industrial food system in producing cheap food for the mass, many scholars have also pointed out the negative and impact of food industry practises that foster unsustainable outcomes (Lang and Heasman 2004; Baldwin 2011; Sage 2012). The literature relates and describes the food industry as

supply chain or generally as food system. Many experts agree that the agro-industrial food system includes practices and impacts that have led to unsustainable outcomes for the food system, particularly practices such as high-intensity animal production or the produce of foods out of season. These and other practices have led to unsustainable outcomes globally, such as greenhouse gas emissions, overconsumption of fresh water through food production and extensive energy consumption. At the same time, the current food system is unsustainable and has implications for social wellbeing and health. These include large proportions of the world population being either malnourished or overweight, and the exploitation of workforces (Defra 2006; Hinrichs and Lyson 2007; Bellarby et al. 2008; Baldwin 2011). Particularly in rich countries, a shift was happening as the development of better housing, science and overall life quality resulted in life expectancies of well over 75 years and the extreme consumption of food became a serious health issue. Current food sustainability challenges include the rise of diet related illnesses moved the thinking from 'eat more to eat less' which stands in contrast to the interests of food businesses (Nestle 2013).

On the primary production side key sustainability challenges evolve around soil, water and biodiversity depletion, as well as ethical concerns regarding large scale livestock production methods. Food production actors cause stress to the food system through high volume of packaging waste and low-priced foods that are of low nutritional quality. The food industry is profit-oriented and has therefore an interest to shape consumers eating and purchasing behaviours towards overconsumption, which leads to more waste and diet related health problems (Lang and Heasman 2004; Sage 2012).

On the other side, there is a growing number of consumers and governments that are aware of these unsustainable practices and are putting food industry actors publicly under pressure. According to a number of authors, the food industry has to become more sustainable in order to satisfy critical consumers and governments (Maloni and Brown 2006; Vermeir and Verbeke 2006; Wognum et al. 2011; Beske et al. 2014). In relation to this development and "*threatened by possible government regulation and critical public opinion, industries often undertake self-regulatory actions, issue*

statements of concern for public welfare, and assert that self-regulation is sufficient to protect the public" (Sharma et al. 2010, p.1).

At the same time from a food supply chain perspective, it appears that food industry actors have a strong long-term economic interest in becoming more sustainable. A number of authors state that in the current global agro-industrial food system, food industry actors have to become sustainable in order to be competitive and successful. (Hamprecht et al. 2005; Maloni and Brown 2006; Markley and Davis 2007; Sharma et al. 2010). This can involve the consideration of alternative systems of global food production (Hinrichs and Lyson 2007).

Maloni and Brown point out that it can be critical for food industry actors to understand the wider implications of sustainability. The authors state that "*beyond ethical considerations, consumer criticism of perceived cooperate sustainable responsibility (CSR) deficiencies can be extremely detrimental to corporate profitability and market share […]*" (Maloni and Brown 2006, p.35). Similarly, Markley and Davis point out that:

> *"it becomes increasingly important for firms to evaluate the impact that a sustainable supply chain strategy has on the triple bottom line. Specifically, companies should begin to evaluate not only their supply chains' impact on their traditional financial bottom line, but also on their social/ethical (via multiple stakeholders) and environmental performance"* (Markley and Davis 2007, p.1).

Not only do social and ethical considerations become critical for the business interests of food industry actors, but also very tangible and threatening impacts of unsustainable practices. In the context of maintaining global food supply chains Hamprecht et al. argue that:

> *"For the food industry, the depletion of arable land and a growing world population demand controlling the sustainability of agricultural inputs to the industry. Controlling the sustainability of these supplies means controlling the economic, social, and* environmental performance of the supply chain. In practice, little is known about how companies can efficiently extend their existing supply chain controls to cover these aspects" (Hamprecht et al. 2005, p.7).

The literature also points out the difficulties that food industry actors can potentially face in fostering more sustainability within the food system. Within the field of agro-

ecological sustainability, Goodmann and Watts even question whether "*achievement of sustainability [should] be regarded as an inevitable-or Utopian or unachievable-outcome?*" (Goodman and Watts 1997, p.256).

For food industry actors, collaborations and collaborative activities can play a key role in the development and implementation of sustainable practices. Reflecting on key literature across a diverse range of disciplines, collaboration between supply chain partners appears to be of particular relevance (Andraski 1998; Anderson and Lee 2001; Hamprecht et al. 2005; Maloni and Brown 2006; Matopoulos et al. 2007). More specifically, the increase of global food supply chains forces food industry actors into more collaborative thinking. Sustainability appears to play a key role within the food industry's collaborative efforts, including the focus of maintaining and improving efficient production and supply chains (Goodman and Watts 1997; Hamprecht et al. 2005; Baldwin 2011). This is not just a theoretical and abstract concept within the agro-industrial food system, but also an emerging field with growing numbers in participation and popularity. In this context, Hamprecht et al. point out the example of the 'Sustainable Agriculture Initiative' (SAI) which was founded by Danone, Unilever and Nestlé in 2002 with the aim to develop collaboratively sustainable practices within the agricultural production. Its wide acceptance within the agro-industrial food system can be seen, as "*today, it enjoys active participation of food operators such as McDonalds, Sara Lee and Kraft. Jointly, these businesses develop social, environmental and economic standards that they can communicate to commodity traders*" (Hamprecht et al. 2005, p.9).

1.4 The role of collaborative knowledge in food sustainability

This section elaborates further on the role of collaborative platforms in food sustainability. In particular, this section focuses on the wider knowledge provision and communication role of food related collaborative platforms.

According to a number of empirical studies, collaborative platforms can help to improve governmental and industrial activities in the field of sustainability (Clarke and Roome 1995; Clarke and Roome 1999; Lozano 2007; Lozano 2008; Innes and Booher 2010). A good point was taken forward by scholars such as Clarke and Roome who see collaborative multi-stakeholder activities as indispensable in the context of sustainability. For them, there "*is a growing need to develop mechanisms through which collaborative problem-solving can occur, since it is widely held that environmental problems are beyond the capabilities for single organisations*" (Clarke and Roome 1995, p.191).

Collaborative interactions can be regarded as an important approach to understanding the complexity and uncertainty of current and future food sustainability challenges. Within collaborative activities the advantage of knowledge sharing, and learning can be seen as the inclusion of a variety of stakeholder perspectives across the food system. Such collaborative knowledge sharing and learning can be labelled as a multiparty learning-action network which is "*a set of relationships which lay over and complement formal organisational structures linking individuals together by the flow of knowledge, information, and ideas*" (Clarke and Roome 1999, p.297). This argument emphasises that actors along the food value chain are in need of knowledge that can foster sustainable development. This knowledge, however, is not always part of the actor's repertoire, and in order to gain this knowledge engagement in collaborations can be beneficial (Clarke and Roome 1999).

Little is known about the type of knowledge that is created and seen as critical within food related collaboration platforms. Food sustainability as outlined in Section **Error! Reference source not found.** is a dynamic system that includes elements around food culture or social justice, and these areas can be difficult to express through certain knowledge forms such as numeric knowledge. This point has specifically been raised in the field of sustainable agriculture policy. There is a lack of appropriate knowledge that is able to illustrate the complexity and dynamic nature of a sustainable agro-food system (Thompson et al. 2007).

It is also challenging to identify the motives of actors to form or join a collaboration, as they are often multi-dimensional and difficult to pinpoint. An overarching motive is likely to be that:

> "*collaborative processes that are designed and managed to generate collaborative rationality are likely to produce, not only effective options for how actors can more forward together to deal with their problems, but also individual and collective learning that will help make the community more adaptive and resilient*" (Innes and Booher 2010, p.9).

This point of Innes and Booher is critical, but it makes it difficult to specify how a community gains resilience through learning and what adaptive and resilient entails. It was therefore important for this research to look at internal and external effects of collaborative knowledge within food sustainability and to clarify the resilience and adaptiveness argument of Innes and Boohers.

Food businesses are often seen by others (such as NGOs) as actors that are mainly interested in economic benefits. Recent years have shown that leading food businesses are trying to develop more sustainable practices through collaborative approaches (Lang and Barling 2012). The SAI already mentioned in Section **Error! Reference source not found.** is an example of this, formed by Danone, Nestlé and Unilever and involving members such as Kellogg's, Kraft, McDonalds and PepsiCo (SAI 2008). According to big businesses such as Monsanto, sustainability is seen as something "*ecologically sound, economically viable and socially acceptable*" (Aiking and De Boer 2004, p.361).

Food sustainability is highly diverse, complex and multidisciplinary. For many scholars this means that for the development of a sustainable food system it is beneficial to involve a broad spectrum of actors along the food value chain from industry, civil society and government (Schmidheiny 1992; Starik and Rands 1995; Fadeeva 2005). This sort of collaboration in food sustainability can be challenging. Fadeeva argues that "*often, driven by expectations of innovations and efficiency, actors can launch the collaboration*

without realising the inherited complexities of the multi-actor's initiatives" (Fadeeva 2005, p.173).

1.5 Subject and scope of the research

The previous Sections **Error! Reference source not found.** - **Error! Reference source not found.** introduced the rising importance of collaborative platforms in the food system and how their knowledge can play a role in the complex food sustainability. Governmental bodies, food businesses, non-governmental organisations and consumer groups are participating in collaborative activities (see Figure 1.1) with the aim of learning and knowledge sharing.

This research project has therefore focused on four research questions concerning collaborative knowledge sharing and learning activities within food sustainability. The research was carried out by using a case study research design on the two collaborative platforms. These were mainly selected due to their multi-stakeholder membership, their clear commitment to improve food sustainability, their focus on knowledge sharing and learning, and their desire to inform and support policy makers and governments. A detailed outline on selection process and the case studies can be found in Sections 3.3 and 3.3.

Structure of the thesis

Chapter one of this thesis has set out to outline the research problem and the policy terrain which this research explores. The problem relates to the lack of knowledge concerning collaborative platforms in the food system and their role within food sustainability. This research aims to understand how such collaborative platforms learn and how their knowledge impacts food sustainability.

Chapter two sets out the theoretical and real-world problems addressed by this thesis. This includes academic literature on multi-stakeholder collaborations and the food system, collaborative learning and knowledge sharing and the role of knowledge in policy. The aim of Chapter two is to provide argumentative evidence from the literature to demonstrate the significance of the four research questions.

Chapter three of this thesis sets out the research design that has been applied to the research, including the methodological, theoretical and conceptual framework. Details are outlined on the four research questions, the used methods for data collection, selection process of the literature and case studies, and the analysis of the findings and ethical considerations.

Chapter four outlines the research findings that were drawn from interviews and document analysis. This chapter follows an internal structure that is determined by each research question presented through 16 key themes. The focus of the findings chapter is to outline the thematically structured findings in a neutral way.

Chapter five outlines the analysis, interpretation and discussion of the research findings, including how the 'problem' was set out at the start of the research process (see Sections **Error! Reference source not found.** - **Error! Reference source not found.**). This chapter relates to the analysis of the research findings and relevant academic literature. To maintain a structured approach, this chapter is also structured through the same 16 themes from the previous chapter. This also helped to maintain a coherent approach between data presentation, analysis and discussion.

The thesis concludes with Chapter six which presents a final overview of the research outcomes in the wider food policy context and points to new potential research. This includes critical reflections on the whole research process and its limitations. Since this research is in the area of food policy, the recommendations developed in this thesis are addressed to a number of stakeholders in the food system that can benefit from these research outcomes.

1.6 Summary

Chapter one has set out the research problem, elaborated on why sustainability matters, why it matters for collaborative platforms that operate within the food system and why their knowledge plays a critical role within food sustainability. This research sets out to explore food related multi-stakeholder collaborations and their role as knowledge creators and providers in the context of food sustainability. This chapter pointed out that unsustainable practices and developments in the food system have led to negative effects on the wellbeing of humans and the environment. This includes the depletion of natural resources, which directly create financial uncertainty for the food industry. As a response to these developments, food related collaborative platforms have emerged that claim to work on solution that foster food sustainability. These collaborative groups can consist of different stakeholders and are often food industry led. This circumstance forms the foundation of this research with the aim to understand the role of these collaborative platforms and in particular their contribution as knowledge providers to food sustainability. Collaborative multi-stakeholder initiatives appear to have a wide range of functions from advising government bodies, to supporting local projects or developing industry partnerships. Some of these collaborations have become important within the thinking and development of food sustainability. In order to understand the fundamentals of this research this chapter has explored the essence of sustainability (with particular focus on food sustainability), including the historical significance, the role of knowledge in food sustainability.

Historically the modern meanings of sustainability stem from the negative impacts of the Industrial Revolution in the mid-18th century. The transformation of human life through the change in nature, environment, extensive working in factories and use of resources has led to concerns over the long-term impact of these developments. Hence

it is important to recognise that the concerns and the broad arguments concerning sustainability began two centuries ago.

Moving on from the historic overview of sustainability, this chapter outlined a number of different definitions and meanings of the term sustainability and concluded that there is no single definition that is commonly accepted by scholars and other stakeholders. This has particularly led to the view of some academics that sustainability has become a meaningless and vague term that lacks clarity. In comparison, other academics argue that the term sustainability becomes meaningful through specific stakeholders and their understanding of sustainability and how that term relates to their specific environment. Hence this chapter has outlined systematically the modern meanings of sustainable - sustainable development, as well as environmental, economic, social and food sustainability. This exploration is particularly in line with the three pillars (economic, social and environment) of sustainability which are often used in academia to express the three core areas of sustainability. A very common and significant area of sustainability is connected to 'Sustainable Development'. 'Sustainable development' means for some scholars an element of progressing and leading up to be sustainable. In the wider sense this can relate to the development of any situation or circumstance towards something 'improved'. At the same time the term 'sustainable development can also be negatively associated with colonial thinking and 'helping' under-developed regions that are mainly in the global south. This view is particularly represented by the UN and widely spread in popularity through the Brundtland Commission and their understanding of 'sustainable development'. The second area of sustainability that is explored in this chapter relates to environmental sustainability. Environmental concerns and the thinking around environmental sustainability gained importance at the global political stage only in the 1970s and emphasises the negative impact on nature through human actions, such as industrial waste and effects such as climate change.

The third area of sustainability that is explored in this chapter relates to sustainability in business and economy. The main idea behind economic sustainability is to have economic prosperity while maintaining and the needs to preserve and protect

environmental and social elements. For some economic sustainability requires a trade-off between environmental sustainability and economic prosperity since for them economic prosperity is often linked to unsustainable practises such as air pollution from factories. For others this thinking is out-dated as improvements environmentally can promote innovation and economic profit. Methods such as the 'life cycle analysis' or the 'footprint analysis' provided means to bridge price and ecosystem viability. Such technical methods are often widely recognised by governments and industry actors to assess 'how sustainable' certain products, processes or services are. Sustainability is a natural topic in business and economics since the core concerns of economists are around the management of resources good and services in a complex and changing world. At the same time businesses are usually reluctant to be sustainable in the long term due to the way western economy functions (focus on quarterly earnings and volatility to the stock market).

The fourth area of sustainability that is explored in this chapter is 'social sustainability'. 'Social Sustainability' focuses on elements that affect how communities and societies live. Of the three pillars (economic, social and environment) of sustainability, the social element has been the least well theorised and some scholars argue that this was due to the focus on environmental sustainability issues. It also appears that most of the work on social sustainability is focuses on less-developed countries and on the development of essential needs. It is questionable how these concepts are applicable for people that live in developed countries, as social issues can differ. Recent developments in academia reflect that social sustainability is getting more attention with concepts, such as social capital, social cohesion, social inclusion and exclusion. At the same time it is recognisable that many aspects of social sustainability are included within other areas of sustainability, such as the correlation of economic sustainability and the impact on communities.

The fifth area of sustainability focused on food sustainability which is at the same time the relevant sustainability field for this research. Food sustainability includes many elements of other sustainability areas, such as environment or economic but with a

focus on food issues. Key elements of food sustainability concern the primary agricultural production of foods, the processing of food, their distribution, marketing as well as impacts on consumers and their diets. Similar to other sustainability areas, food sustainability does not have a commonly accepted definition. Most food sustainability definitions include the recognition of all three sustainability pillars (environment, social and economic) included into a food system view. A systematic approach that can be used to explore sustainability in the food system is to apply a 'farm to fork' and 'value chain' approach. A value chain can be described as a sequence of processes and activities that make up a product or service, such as planting and processing potatoes to fries which are then sold through businesses and consumed by costumers. Particularly food businesses tend to use a value chain approach in order to understand the overall costs and impact of a food product.

This chapter has also focused on the food industry and its significance within food sustainability. This connection is particularly important since this research has explored two food industry led collaborations and their knowledge contribution to food sustainability. The food industry has been very efficient in providing cheap food that is mass produced and often with low nutritional value. This is on the one hand economically advantageous since calorie dense food is highly affordable. On the other hand these practises of mass production have let to unsustainable outcomes, destroy the environment and exacerbate diet related health issues. In contrary to this, recent developments in consumer's food preferences reflect that more people are aware of unsustainable practises of the food industry and demand a shift towards more healthy and sustainable food produce. This is one of the aspects that forces food industry actors to rethink their practises and shift towards more sustainable forms of food production in order to maintain costumer basis.

Food industry actors have accumulated knowledge on food production, distribution, marketing and consumer behaviour. Companies such as Nestle are operative within the food industry for over 150 years which leads to a vast amount of knowledge on all factettes of food. This knowledge becomes even more significant within food industry

led collaborations, where each actor can bring in different experiences and knowledge on the food system. The last decades have shown a rise in collaborative platforms that focus specifically on the finding of solutions to food sustainability issues. It appears therefore significant to understand to what extend the knowledge of food industry led collaborations are utilised within the space of food sustainability.

2 Chapter Literature review and theoretical background

This chapter explores the literature on the two main academic areas of collaborative platforms, namely, collaborative knowledge and the role of knowledge in policy. The literature on collaborative platforms is systematically explored by looking at the characteristics of multi-actor collaborations and how collaborative platforms can be defined. Since this research evolved around food sustainability, the literature review has also focused on the correlation between collaborative activities and food sustainability. The second part of Chapter two explores the literature on collaborative knowledge by looking at how knowledge can be defined, how the relationship between knowledge and policy is portrayed and how collaborations learn and create knowledge.

Research on knowledge management and collaborative groups has been carried out on technology companies and environmental policy groups. Notably, the work of Gray and Innes on collaborations and their role in policy development and knowledge sharing are ground-breaking. Innes worked for many years on the role of knowledge in public policy and later on collaborative groups and their ability to create influential knowledge in public and environmental policy (Gray 1985; Gray 1989; Innes 1990; Innes and Booher 2010). As of the time of writing a study that focuses specifically on food related collaborative platforms has not been carried out. Research that addresses processes and activities on collaborative knowledge sharing and creation in the context of food sustainability is lacking. The findings of this research fill this gap and contribute to academia, industry, government and civil society stakeholders to make more efficient use of collaborative learning and knowledge transfer in the food system.

Scholars agree that more research in this area is needed, considering the emerging number of collaborations that present themselves as knowledge sharing and learning platforms (Mowery et al. 1996; Tsang 1999; Gray 2000; Simonin 2004; Innes and Booher 2010). This research was not only interested in internal knowledge sharing and learning activities of food related collaborative platforms, but also on the role of collaborative knowledge within the wider food sustainability.

Research on the role of knowledge within food policy has been carried out by Sporleder and Moss who focused on knowledge management in the global food system (Sporleder and Moss 2002). This study points out that "*food supply chain can be analysed using the conceptual foundations of knowledge management to enrich our understanding of [the] food system and how it operates*" (Sporleder and Moss 2002, p.1350). Additional research by Fonte adds to this by blending in the dynamics of local and lay knowledge in the valorisation of local food networks (Fonte 2008).

2.1 Multi-stakeholder collaborations

2.1.1 Collaborative platforms in the policy context

Collaborative platforms can play an important role within governance structures as briefly mentioned in Chapter one. This is relevant regarding collaborations that consist of private and state actors. Within policy arenas, such as environment (Rio +20), health (The Global Fund), or corruption (Transparency International), one can see the rise of collaborative structures between private and governmental actors, moving away from state-centric approaches. This indicates that over the past twenty years there has been an active shift from government and state-centric oriented policy towards governance structures (Rhodes 1996). Rhodes encapsulates governance as "*a new process of governing; or a changed condition of ordered rule; or the new method by which society is governed*" (Rhodes 2007, p.654). However, the term is a site of contestation amongst academics and it is not clearly defined. A reason for this might be that governance is mainly used and researched in theory and little is known through empirical research (Jordan et al. 2005).

There is an ongoing academic debate that has emerged from the 70s around the question of whether the state will remain as an important actor in shaping policy and providing public services. Society-centred academics argue that contemporary and future problems are highly complex. They conclude that the traditional state is overwhelmed and unable to find solutions on its own (Bieler et al. 2004). On the flipside,

modern governance theories state that the government consciously shares power with non-governmental actors. This more state-centric position argues that governments are seeking to govern better and more effectively rather than to govern less (Jordan et al. 2005; Wallington et al. 2008; Bell and Hindmoor 2009). Governments expand their scale of governing within a state-based and top-down setup, by adding new and modern strategies. This results in what some academics call 'soft governance forms'. Jordan et al. similarly point out that governments still aim to deliver the same policies, but with new and different policy instruments, such as voluntary agreements or collaborative platforms (Jordan et al. 2005).

The understanding of governance is critical in relation to such new and different policy instruments. Lang et al. point out that:

> "*governance implies more indirect, softer forms of direction from the state than command and control, and reflects collaborative outcomes, involving a wide range of actors often from the private sector, as well as from government bureaucracy, as much as deliberate interventions by the state*" (Lang et al. 2009, p.75).

This implies an understanding of governance as "*an interactive process of state and public laws and policy with private interests and actors*" (Lang et al. 2009, p.81). Bell and Hindmoor argue that:

> "*through both corporatist and private-interest government arrangements, states offer business associations and other groups influence over the contents of public policy in exchange for public support, access to information, and direct assistance in implementing policy*" (Bell and Hindmoor 2009, p.18).

The terms multi-level governance and meta governance are closely linked to this concept and describes the "*practices and procedures that secure governmental influence, command and control within governance regimes*" (Keating 2010, p.104).Arrangements that are seen as fair and democratically accepted have popular support and are more likely to be stable as opposed to forced governance arrangements (Kjaer 2009). Food policy as a multidisciplinary and complex policy arena is an excellent

example where modern and alternative governance forms could be explored empirically. According to Lang et al.:

> "*governance in the food sector can occur in the absence of direct state involvement when private and societal interests seek to exert forms of control within the market economy. However, the shadow of the state does loom over these arrangements, usually providing some enabling or operating context for this governance*" (Lang et al. 2009, p.77f.).

This understanding of governance in the food policy context reveals a clear shift towards less state-controlled actions, but it recognises the state as the overarching and controlling actor. Within this shift towards more governance, industry actors appear to have a stronger voice and hold more influence in health and food governance. According to Lang and Heasman "*by default, an industry-driven vision of the food supply chain has taken centre-stage. The food supply chain is so huge and so important, in commercial terms, that it cannot operate in a policy or paradigm vacuum*" (Lang and Heasman 2004, p.261). This emphasises the importance of food industry actors within food sustainability and the significance of this research.

Closely related to this is the work from Sorensen and Torfing on governance-networks, a term that means the:

> "*stable articulation of mutually dependent, but operationally autonomous actors from state, market and civil society, who interact through conflict-ridden negotiations that take place within an institutionalized framework of rules, norms, shared knowledge and social imaginaries; facilitate self-regulated policy making in the shadow of hierarchy; and contribute to the production of 'public value' in a broad sense of problem definitions, visions, ideas, plans and concrete regulations that are deemed relevant to broad sections of the population*" (Sørensen and Torfing 2009, p.236).

On food related collaborative platforms, new food alliances can be seen as a result of the protectionism hegemony in food policy. The current agro-industrial food system has key stakeholders, such as food and drink manufacturers that hold strategic positions within the food system. Alliances between such actors can have the aim to maintain and strengthen the status quo. Thus, private actors "*increasingly make strategic decisions to engage with each other and to put joint heat on governments to deliver market reform*"

(Lang and Heasman 2004, p.299). The increased involvement of private actors in delivering public services has led governments to become more interested in strategies for creating and managing networks and partnerships (Bevir 2008).

2.1.2 Theories on collaboration and collaborating

Collaboration is happening and it plays a significant role in the shift from government to governance. The general term collaboration in this research "*is taken to imply a very positive form of working in association with others for some form of mutual benefit*" (Huxham 1996, p.1). Nevertheless, there is no common or accepted definition of the term (Huxham 1996; Williams 2012). There are a variety of terms in the real-world as well as in academia that describe a collaboration. Most food related collaborative platforms label themselves as partnerships, alliances, collaborations, coalitions, or roundtables. In this research, collaborative platforms are regarded as organised interest groups, lobby groups, or pressure groups.

To explore the term collaboration, this chapter considers the overview by Grey that regards frequently used definitions of the term collaboration, in order to understand how collaborative platforms are described and laid out by the literature (Gray 1989; Wood 1991) (see Table 2.1).

Table 2.1 Common elements of definitions of collaboration

Elements	WV	P	L	SGY	NM	RB	G	S
Voluntary membership of stakeholders	O	X	O	O	O	O	O	O
With common interests/shared goals						O		O
Seeing different aspects of a problem/having differences	O	O						
Acting/deciding/managing/exploring/addressing	O	O	O	O	O	O	O	O
Constrictively	O	O						
Shared institutions/rules/norms		X			X	O	O	
Temporary structure						O		
Interactive process	O		O	O	O	O	O	
Search for solutions/to produce change	O	O				O		
Beyond their limited visions and abilities	O					O		

O= element is present; x=element is assumed

WV= Westley and Vredenburg; P=Pasquero; L=Logsdon; SGY= Sharfman, Gray and Yan; NM= Nathan and Mitroff; RB= Roberts and Bradley; G=Golich; S=Selsky

Source: Author after Wood, 1991

Collaborations are often formed on a voluntary basis, where members are motivated through benefits of working together with other stakeholders. The core idea behind collaborations is that independent stakeholders with a shared interest come together to create a beneficial win-win situation. The purpose of such actor constellations is to achieve common goals that are defined by the nature and core beliefs of the collaboration. Gray describes collaboration as:

> "*a process through which parties who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision of what is possible. Collaboration is based on the simple adages that two heads are better than one and that one by itself is simply not good enough*" (Gray 1989, p.5).

The accumulation of resources are seen as key, and collaborative processes can be described as the "*pooling of appreciations and/or tangible resources, e.g., information, money, labour, etc., by two or more stakeholders, to solve a set of problems which neither can solve individually*" (Gray 1985, p.912). The aspect of knowledge sharing and the creation of new knowledge through collaborative activity is a key focus of this research. Indeed, Denise defines collaboration as the "*using [of] information to create*

something new, seeking divergent insights and spontaneity, jointly developing proposals, sharing information, planning joint workshops, and raising funds together among other activities" (Denise 2010, p.21).

Key elements that are necessary to run a successful collaboration have been identified as; credible commitment, clarity of goals, clearly distributed responsibilities, involvement of relevant stakeholders, the setting of intermediate targets, being able to keep members motivated, monitoring progress toward achieving the objectives, and establishing and using incentives and sanction (Weber 1998; Bizer and Julich 1999; Halme and Fadeeva 2000; Fadeeva 2005). It is difficult, however, to define and measure the success of joint initiatives. Through empirical research, Johnson and Johnson identified five elements of group effectiveness including independence among participants, individual accountability, face to face interactions, and social and interpersonal skills (Johnson and Johnson 1991). A collaboration might be seen as successful "*when the collaboration reaches its own goals or when it brings more than 'no-regret' or 'business-as-usual' measures*" (Fadeeva 2005, p.168).

By accumulating the previous outlined definitions of collaboration this dissertation will define food related collaborative platforms as:

Two or more independent stakeholders from civil society and/or industry (located in different or in the same position(s) of the food value chain) that make an agreement in which the members voluntarily collaborate on a non-competitive basis without formal relationship, but through mechanisms that provide reciprocal advantages to achieve goals that members have in common. The partners contribute to the collaboration by providing tangible resources such as money and intangible resources such as knowledge on the basis of a shared vision about the future (Gray 1985; Gray 1989; Pellicelli 2003; Inkpen and Tsang 2005).

2.1.3 Motives of forming a multi-stakeholder collaboration

The basis of collaborating can be that all participating members have a shared or common vision about the future that single members will not be able to achieve on their own (Gray 1989; Huxham 1996). The motives are sourced from the following literature and can be seen as key in determining why actors are interested in collaborating (see Table 2.2):

Table 2.2 Motives to collaborate (literature)

Motives from the literature	Author(s)
Conflict solving	(Gray 1985; Thomson and Perry 2006)
Response to a crisis	(Gray 1985; Huxham 1996)
Decrease environmental turbulence	(Huxham 1996) (Emery 1965; Trist 1977; Gray 1985)
The efficiency argument	(Gray 1989)
Economic benefits and risk distribution	(Huxham 1996; Fadeeva 2005; Williams 2012) (Weber 1998; Bizer and Julich 1999; Ingram 1999; Pellicelli 2003)
Advantage in policy bargaining processes	(Gray 1985)
Create an innovative and creative environment	(Huxham 1996; Pellicelli 2003; Fadeeva 2005; Innes and Booher 2010)

Source: Author

Gray and Thomson and Perry describe conflict solving as a starting point for a collaboration (Gray 1985; Thomson and Perry 2006). Huxham describes this as conflicts between one or more stakeholders "*may be resolved if all parties to the conflict can find a collaborative way of moving forward*" (Huxham 1996, p.11).

A collaborative group can also be formed as a response to a crisis, such as financial crises or the outbreak of mad cow disease. Single members of a collaborative group see themselves unable to respond to a crisis and thus, are forced to collaborate with other actors (Gray 1985). According to Huxham, collaborations may also be formed to decrease what he calls 'environmental turbulence'. Turbulence can occur when

stakeholders act independently in different directions and with various approaches. This behaviour might lead to unanticipated and dissonant consequences within a sector, including negative effects for all involved actors. Thus, stakeholders need to work together as, "*turbulence cannot be managed individually because disruptions and their causes cannot be adequately anticipated or averted by unilateral actions*" (Huxham 1996, p.58). Collaboration can help to coordinate and harmonise actions and the behaviour of actors with the aim creating a more predictable environment that can lead to a 'win-win' situation (Emery 1965; Trist 1977; Gray 1985).

Closely related to this is the efficiency argument for actors to collaborate. Stakeholders who work in the same or related field might benefit from collaborating, as they would be able to split tasks, avoid duplicating work and improve productivity. A main requirement for the efficiency argument is that the collaborative group is based on a non-competitive basis. A competitive environment is likely to slow the collaboration down, as each member is trying to gain an individual benefit (Gray 1989). The role of a non-competitive environment is seen as a significant attribute within the literature on collaboration. Section 2.1.6 explores the role of non-competitive environments in more detail.

Large and long-term projects have often high amounts of financial capital that exceeds the resources of a single actor. Through collaboration, independent stakeholders can achieve capital intensive goals by accumulating capital (Huxham 1996; Fadeeva 2005; Williams 2012). Other authors argue there has been little theoretical and empirical work undertaken that proves the cost efficiency of collaborative activities (Weber 1998; Bizer and Julich 1999; Ingram 1999). The benefit of dividing costs between collaborating members is also an advantage of dividing risk. For example, in the event a project fails, members of collaborative groups can divide negative financial and reputational outcomes. Furthermore, geographical and segmental market benefits are also seen as key motives for collaborating. In addition to financial benefits, actors seek to collaborate in order to access new geographic areas to expand their market access or a certain market segment (Pellicelli 2003; Fadeeva 2005).

If collaborative policy groups consist of many different stakeholders, this can have an advantage in policy bargaining processes. A collaborative group can act as one united body, and this has the benefit of creating one powerful voice. This can be advantageous in a bargaining process with competing actors that have contrary beliefs or goals (Gray 1985). Collaboration can have a significant impact for industry actors, such as food businesses who would lobby to "*use every means at their disposal – legal, regulatory, and societal – to create and protect an environment that is conductive to selling their products in a competitive marketplace* (Nestle 2013, p. 93).

Multi-actor collaborations can also be beneficial for creating an innovative and creative space where participants develop concepts and ideas through reciprocal dialogues and brainstorming. The element of knowledge transfer and learning is an essential benefit for participants of a collaborative group (Huxham 1996; Pellicelli 2003; Fadeeva 2005; Innes and Booher 2010). A collaborative environment can highly stimulate innovation and creativity through knowledge exchange and learning mechanisms (Huxham 1996; Williams 2012).

2.1.4 Risks of forming a multi-stakeholder collaboration

Empirical studies show that most attempts of collaboration are unsuccessful (Huxham 1996). Fadeeva states that "*potential (collaborative) advantages should not divert our attention from the fact that collaboration does not always work well and surely does not work well in all contexts*"(Fadeeva 2005, p.172). Collaborative initiatives are often criticised for delivering weak results. This is likely gleaned from the empirical observation that collaborations target realistic and easily achievable results, which are less ambitious as there is a "*realisation that the potential of collaborative initiatives to deliver superior results can be restricted by the organisation to consensus-based results*" (Fadeeva 2005, p.168f.). Many members within collaborations perceive the high investment of time as problematic during collaborative work (Weber 1998; Fadeeva 2005). This is referred to as 'collaborative inertia' which is "*the situation when the apparent rate of work output from a collaboration is slowed down considerably compared to what a casual observer might expect it to be able to achieve*" (Huxham 1996, p.4).

There are a number of risks and disadvantages concerning collaborative platforms. Collaborative activities need more resources than non-collaborative activities. For example, collaborative groups can be more time and cost intensive than working on a non-collaborative basis. According to Fadeeva "*contrary to popular beliefs about resource reduction through collaborative process, results of some collaborative projects demonstrate the opposite*" (Fadeeva 2005, p.169). The amount of resources that a collaboration requires often depends on the number of members, the grade of heterogeneity (type of members) and the level of development regarding the participatory process (Halme and Fadeeva 2000; Halme 2001; Fadeeva 2005). If members are based in geographically remote locations, meetings and other collaborative activities need to be planned and co-ordinated. Time is needed for achieving and formulating mutual understandings, agreements, or trust (Huxham 1996).

Collaborative groups are not homogenous entities and often consist of members from different political, economic, ideological or social backgrounds. Reaching consensus can

be challenging and therefore disadvantageous for individual actors and their collaborations (Huxham 1996; Williams 2012). Actors may have shared common goals, but different methodologies or approaches in how to achieve these goals. While may successfully come to fruition, it does not always result in conflict elimination. Indeed, collaborations can lead to new conflicts between actors that did not exist in the first place (Fadeeva 2005, p.170).

The aspect of communication within collaborative formations is key for this research, as it is a critical element of collaborative learning and knowledge exchange. Based on the members' background, individual actors can have differences in their communication skills. Collaborative groups consisting of members from different professions or industries can experience a breakdown in communication. Differences in culture and language can also lead to difficulties, such as international collaborative groups that consist of members from different countries (Huxham 1996). There are also more invisible elements, such as differences regarding 'frames' of individuals within collaboration that can cause difficulties (Lewicki 2002; Gray 2003; Ansell and Gash 2008). A 'frame' is defined as the way individuals perceive an issue, situation or practice. This also includes values, assumptions, causal understandings, and ideal visions for the future. Innes and Booher empirically investigated such frames within collaborative structures. They revealed that invisible frames become visible when they interfere with the frames of the other members (Innes and Booher 2010).

Lewicki et al. illustrate this by pointing out the three frame types which include identity, characterisation and conflict management (Lewicki 2002). The identity frame describes how an individual within a collaboration identifies him or herself. Within different environments and under certain circumstances individuals can have varied identities; they can be, a researcher at the same time as a mother or environmentalist. The characterisation frame considers the strength of the individual's group identity. For Innes and Booher this can be problematic within a collective, as this frame brings along a blaming mentality towards other groups. The characterisation frame can lead to a strong polarisation within a collaboration and to a less open minded environment (Innes

and Booher 2010). The conflict management frame examines how an individual may deal with a conflict. Typical responses to conflict management frames include the tendency to avoid, joint problem solving, or to take control of the conflict authority (Gray 2003).

Being in a collaborative group can expose actors up to risks of status and loss of legitimacy. An individual member can be linked with potential failure, even if they are not at fault. Besides loss of status, this can also lead to loss of reputation and financial position (Huxham 1996; Williams 2012). In addition, power relationships between group members "*are invariably reconfigured, with accountability arrangements often unclear and opaque*" (Williams 2012, p.17). This uncertainty can result in a loss of internal stability, control and autonomy for individual members. Partners can get confused about who is responsible for particular aspects and actions within a collective (Huxham 1996; Williams 2012).

2.1.5 Structure and type of collaborative platforms

Different organisational forms may occur within collaborative platforms. According to Clarke and Roome, collaborative platforms can have both a trans-organisational or supra-organisational character (see Figure 2.1). A trans-organisational structure is defined as a network:

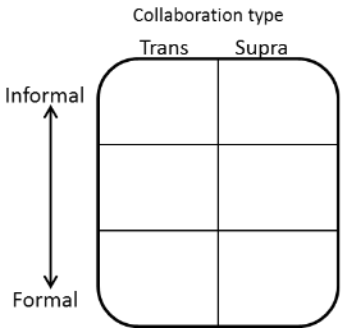
> "*between organisations in a particular organisational set, where the organisational set is the system of relationships between any single focal organisation and its transactional environment, such that individual organisations in the set are linked in their pursuit of shared objects*" (Clarke and Roome 1995, p.193).

An example for a trans-organisational collaboration would be a collaborative group between two independent milk producers or between an independent milk producer and a milk trade association. A supra-organisational collaboration is defined as a network:

> "*between organisations in an organisational domain, where the organisational domain includes all those organisations, or the field, identified through a common concern or set of problems – these networks are aimed at resolving meta-problems*" (Clarke and Roome 1995, p.193).

Meta-problems are problems that exceed the limits of an organisation or actor regarding its economic, political and social level (Pasquero 1991; Clarke and Roome 1995). Supra-organisational structures occur along a value chain between actors that are directly and indirectly involved (Clarke and Roome 1995). An example of a supra-organisational network can be seen between livestock farmers, butchers and supermarkets when aiming to resolve a contaminated meat scandal. Closely related to the organisational structure is the collaboration type. Clarke and Roome describe this as 'network location' located on a spectrum between formal and informal.

Figure 2.1 Framework for collaboration type



Source: Author's own figure modified after Clarke and Roome 1995

- Formal collaborations with a trans-organisational structure are usually 'behind the scene' activities with informal and loose partnerships.

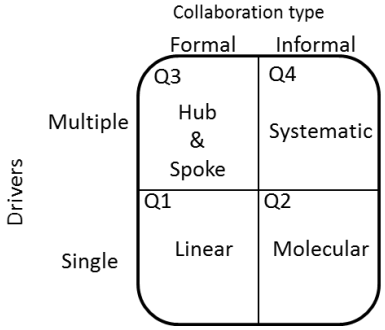
- Formal supra-organisational collaborations are usually networks that play a more active and direct role, such as joint ventures

- Informal collaborations with a supra-organisational structure can be described as a platform of reciprocal information flow between members

(Clarke and Roome 1995)

Based on their different frameworks, Clarke and Roome identified a number of network styles for industry led collaborations. These styles can be used to identify the central motive for industry actors to collaborate on topics, such as environmental improvement and sustainability (see Figure 2.2) (Clarke and Roome 1995). These networks are relevant to the case studies of this research as they are food industry led.

Figure 2.2 Framework for networking styles



Source: Author's own figure modified after Clarke and Roome 1995

The linear style Q1 revolves around a single major factor, such as a legislation, which is the rationale for actors to shift their activities towards more environmentally friendly and sustainable concepts. The linear style is based on a formal and structured collaboration. In contrast, the molecular style (Q2) is on a single factor but is embedded in an informal collaborative environment. The Hub and Spoke style (Q3) are industry collaborations motivated by a number of factors and stakeholder opinions. Agreements and decisions mainly occur through a process where each individual member 'speaks out' their opinion to a central hub or organisation on a bilateral basis. The central hub accumulates all perspectives and makes final decisions. The systematic style (Q4) describes a collaborative environment between stakeholders that are facing multiple and interrelated pressures. This network style is on an informal basis and exceeds business boundaries, as the process can include non-business actors from civil society (Clarke and Roome 1995).

2.1.6 The role of a non-competitive environment

Competitiveness plays a significant role within collaborations and collaborative knowledge. This is exemplified within industry led collaborations, as actors are usually operating within a competitive environment. According to the literature, non-competitive collaborations are more likely to be a 'win-win' situation and competitive collaborations tend to be more likely a 'win-lose' situation (Tsang 1999, p.214ff.). Even if different stakeholders are direct competitors, they can still participate within a non-competitive platform when they do not bring a competitive mentality along to the collaboration (Huang and Yu 2011). A competitive mentality would mean that each stakeholder within the collective is trying to learn faster than others, in order to gain a benefit and advantage (Huang and Yu 2011, p.384). Lozano argues that even if a competitive mentality has been praised for improving productivity and innovation:

> *"recent developments, especially in sustainability, have proven that without collaboration (*and by being competitive*), with customers, suppliers, competitors, communities, and other stakeholders, there is no real advancement, and in certain cases companies can even lose what has come to be known as their "licence to operate", i.e. the allowance that civil society and government give to the company through legal status and purchases of the company's products"* (Lozano 2008, p.502).

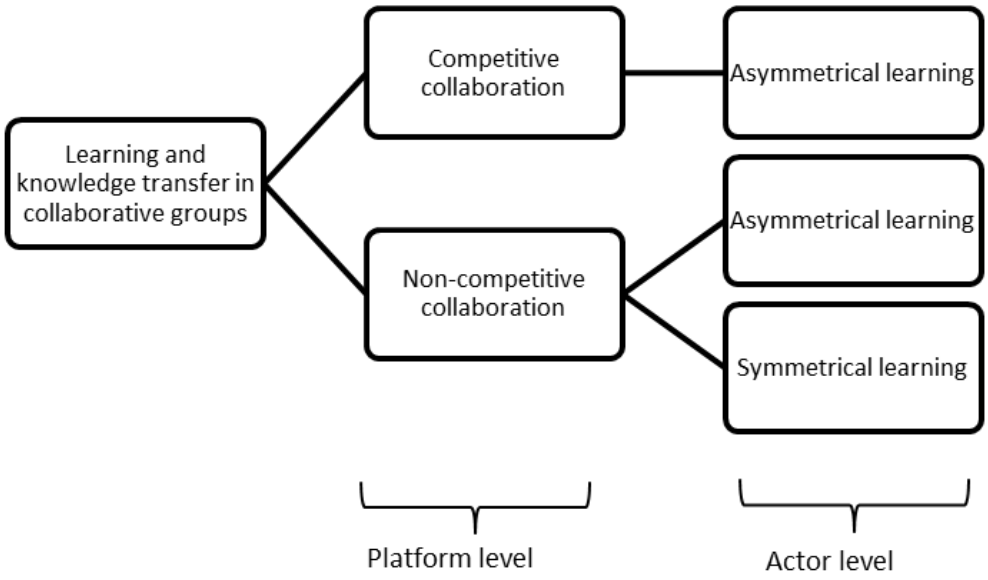
The theoretical distinction between non-competitive and competitive collaboration does not often reflect reality. Even if actors intend to not bring a non-competitive mentality along, there could be partial competitive behaviour and asymmetrical power distribution. According to Lozano, "*interactions in organisations are rarely balanced. Usually an individual, group or organisation holds more influence than others*" (Lozano 2008, p.501).

A collaboration and its competitive/non-competitive character are particularly relevant regarding inter-partner learning processes. Since this research focuses on learning and knowledge sharing and the two case studies are food industry led collaborations, it is vital to have more of a clear understanding on the correlations between non-competitive/competitive mentality and collaborative learning and knowledge sharing. Tsang and other authors claim that stakeholders who are in a collaborative group can

be seen as participating in learning battlefields. The reason for this is that industry led collaborations have by nature a competitive mentality regarding inter-partner learning (Hamel 1991a; Lei et al. 1997; Tsang 1999; Simonin 2004). Asymmetrical learning might occur between members of a competitive collaboration, as they "*may sometimes be more likely to view collaboration as a race to get to the future first, rather than truly cooperative effort to invent the future together*" (Hamel 1991a, p.89). In this context, Hamel distinguishes between asymmetrical and symmetrical learning structures within collaborations (Hamel 1991a).

Depending on the actor constellation within the collaboration and the distribution of power, differences in collaborative learning and knowledge sharing might occur. Asymmetrical learning within a non-competitive platform can happen when some members have more resources, such as financial capital or internal specialists and more experience in making use of external knowledge synergies than other members (Hamel 1991a; Inkpen and Tsang 2005; Huang and Yu 2011). Even if members participate in a collaborative platform with a non-competitive mentality, differences in collaborative learning and knowledge absorption might occur (see Figure 2.3).

Figure 2.3 Symmetrical and Asymmetrical learning



Source: Author

Contrary to this position, an empirical study by Simonin demonstrates that regardless of the competitive regime of the collaboration, there are no differences in the learning intent for non-competitive and competitive collaborations. Simonin concludes that if there is a learning competition, it is a race against oneself evidencing the disconnect between learning motivation and the degree of competition within a collaboration (Simonin 2004).

2.2 Collaborative learning and knowledge sharing

This section focuses on collaborative learning and knowledge sharing processes within the policy environment. Collaborative multi-stakeholder platforms consist of individual members and collaborative learning stemming from individual learning. From this standpoint, this section first explores the literature on how collaborations learn. This includes theories and concepts on individual and collaborative learning and knowledge sharing mechanisms as it is critical for this research to explore both levels of knowledge creation. Theories and concepts on individual learning can help to understand how collaborative learning occurs through individual members and how learning in a group environment is perceived by the participants of the group. Second, this section outlines concepts on how collaborative knowledge can play a role in policy development and implementation. As this research focuses on the area of food sustainability, all outlined concepts of learning and knowledge sharing are put into a sustainability context.

Learning processes are one of the most acknowledged mechanisms that shape policy processes (Persson 2013). In the field of knowledge management, the learning process is mainly described as a positive situation where an individual or group gains knowledge through teaching, life experience or problem solving. The new knowledge is then applied to situations where it was previously not considered (Innes 1990; Kuhn 1996; Allred 2001). Learning can also be regarded as a negative process where individuals or groups learn something ‘wrong’, which leads to a decrease of effectiveness (Huber 1991; Crossan et al. 1995). Scholars generally distinguish between two types of learning. The

first type is learning through processes of incremental change. The second has a more radical perspective, such as innovation, paradigmatic and revolutionary change (Cohen and Levinthal 1990; Boisot 1998; Hall 1998; Lane et al. 2001; Huang and Yu 2011). These two types of learning can overlap, since both describe a change or development of existing knowledge "*either by combining elements previously unconnected or by developing novel ways of combining elements previously associated*" (Nahapiet & Ghoshal 1998, p.248). Some scholars distinguish the different orders of learning, where transformational learning is seen as more valuable than incremental learning. This includes knowledge creation through both the mechanisms of combination and exchange (Argyris and Schon 1974; Crossan et al. 1995; Schumpeter 1934; Innes 1990; Crossan et al. 1995; Moran and Ghoshal 1996). In order to explore learning mechanisms within collaborative platforms from an in depth and theoretical perspective, this section elaborates on the following eight areas:

I) The spectrum of knowledge
II) Knowledge construction and ideology
III) Collaborative learning in the context of sustainability through creativity
IV) Adaptive-anticipatory-action-loop-learning
V) Collaborative learning through dialogue
VI) Multidimensional sustainability-influence memework
VII) Nonaka's knowledge spiral
VIII) Social capital and collaborative learning

These theories and models help the research process to identify critical elements of collaborative learning. This functions with the purpose of guiding the researcher, and also promoting understanding of the potential gaps in the academic research and literature.

2.2.1 The spectrum of knowledge

The term 'knowledge' has a broad spectrum of definitions that can range from different ways of how knowledge is described in the literature (Nonaka and Takeuchi 1995; Spek and Spijkervet 1997; Liebowitz 1999; Alavi and Leidner 2001).

From a technocratic perspective, knowledge can be structured through hierarchy. Knowledge hierarchy is a hierarchal order of data, information and knowledge. The smallest entity is data, which can include facts, sounds or images. Information would appear at a higher level than data, as it describes formatted, filtered and summarised data. Knowledge sits above data and information at the highest hierarchical order and includes ideas, rules, and procedures that shape and guide actions and decision making processes (Liebowitz 1999). This understanding, however, is very simplistic and fails to demonstrate the complexity of knowledge. Another way of understanding how knowledge is discussed in the literature is by considering how knowledge is stored and organised. Knowledge can reside and be stored in the human mind, organisations, documents or computers. Knowledge that is stored in the human mind is often very complex and intangible, organisational knowledge is often characterised as diffuse and distributed, document knowledge is a very tangible knowledge form, and computer knowledge is a formalised knowledge form that is often well-structured and organised (Liebowitz 1999).

Such definitions of knowledge can provide a foundation for understanding what knowledge can be. These understandings are important, as the term knowledge plays a central role within this research. Different actors can have varied understandings of the term knowledge, therefore a clear distinction between types of knowledge can assist understanding the research findings.

From a sociological perspective this understanding of knowledge is too narrow and simplistic, as there are forms of knowledge that fall into a borderline category. Thus, a more holistic approach to the understanding of knowledge is needed. In this research, the term holistic implies "*the belief that the parts of something are intimately*

interconnected and explicable only by reference to the whole" (Trodd 2016, p.493).A step towards a more holistic approach considers the concept of knowledge accessibility and typology, which can be described through the three pillars; tacit, implicit and explicit knowledge (Hicks 1995; Nonaka and Takeuchi 1995; Quinn et al. 1996; Brooking 1997; Spek and Spijkervet 1997; Liebowitz 1999; Winterton et al. 2006; Collins 2007).

The most tangible and accessible form of knowledge for humans is explicit knowledge, as it is already presented in an accessible and well organised form. For example, explicit knowledge manifests as an IKEA manual on how to assemble furniture, or it might present as an annual report. On the other hand, implicit knowledge can be accessed through the process of discussion and questioning, which is a highly likely situation during collaborative activities.

Tacit knowledge is a form of knowledge that is often discussed in the literature (Hicks 1995; Nonaka and Takeuchi 1995; Liebowitz 1999; Nonaka 2006; Collins 2007). It is considered to be the most difficult knowledge form to access, as it is only possible through knowledge elicitation and observation of behaviour, thereby being indirect. The classic example of tacit knowledge emerges from the work of Polanyi (1958). The author uses the example of riding a bike to elucidate the concept of tacit knowledge; the knowledge of how to ride a bike can only be transferred through actively practising rather than learning the activity through reading a book. Collins extends the understanding of tacit knowledge by distinguishing between 'somatic-limit tacit knowledge' and 'collective tacit knowledge'. The 'somatic-limit knowledge' is based on the concept that the capacity of the human brain is limited, resulting in difficulty comprehending and expressing knowledge, such as how to ride a bike without actually physically riding. This limitation is, according to Collins, based on human capacity or incapacity rather than the knowledge itself, as it is technically possible to teach robots to the act of riding a bike.

Collective tacit knowledge is an additional dimension of tacit knowledge that is related to the knowledge itself. This form of knowledge can only be learned through social

interactions and behaviour. Collins extends the example of riding a bike to explain that even if one could learn how to physically ride a bike without prior practise, knowledge on how to behave in traffic (such as the ability to manage traffic at an intersection using eye contact) can only be learned through experience (Collins 2007).

Theories on tacit knowledge are critical for this research, as industry actors play a key role in the development and distribution of tacit knowledge. According to Hicks, the driving motive behind why companies publish research is based on the lack of tacit knowledge. This suggests that companies publish knowledge that has been researched through experience and activities to make tacit knowledge more accessible.

For this research it is also important to distinguish between lay and professional knowledge as members of a collaborative platform may understand knowledge through these two spectrums (Innes 1990; Radaelli 1995; Hustedt 2013, p.47). Lay knowledge can emerge through every-day life. Thus, "*lay persons build their reasoning on their every-day-experience and form their judgments according to their individual norms and values*" (Hustedt 2013, p.47). In contrast, professional knowledge is provided by "*professionally trained individuals usually appointed by professional organizations in a wide range of policy domains*" (Hustedt 2013, p.47).

This understanding of knowledge can be regarded from a power and policy perspective. The dominance of professional knowledge and the recognition of lay knowledge has been discussed widely. Indeed, professional and ''scientific knowledge'' is often seen as more powerful than lay knowledge. This can lead to a situation where certain groups that are seen as 'lay- people', are being discredited in making their voice count (Gaventa and Cornwall 2008; Singelmann et al. 2012). At the same time, there are developments that show an emerging recognition of lay knowledge in the policy making process, such as within rural policy development (Csurgó et al. 2008). Bäckstrand goes even further to state there is a reframing in the policy-making process. For her:

> "*civic science alludes to a changing relationship between science, expert knowledge and citizens in democratic societies. In this perspective, citizens and the public have a stake*

in the science-politics interface, which can no longer be viewed as an exclusive domain for scientific experts and policy-makers only" (Bäckstrand 2003, p.24).

Theorists who focus on power have claimed that it is not only important to analyse those voices (knowledge) that have been organised and recognised in the policy making process, but also those that have been left out (Brock et al. 2001). Thus, it is critical for this research to understand what types of knowledge are developed and promoted within collaborative platforms as well as the type of knowledge that are left out in the context of food sustainability.

2.2.2 Knowledge construction and ideology

In the context of this research the term ideology is regarded from an Althusserian perspective as a set of norms, ideas, concept and beliefs that shape and influence the motives, goals, and expectations of an individual or group (Althusser 1976). Knowledge of an individual is influenced and shaped by ideology. Ideology plays an important role for this research as collaborations and their members can have a variety of ideologies, which in turn can shape their actions. Within a political, such as food sustainability, ideology is likely to shape the way members of a collaboration think, create and share knowledge.

Dant refers to a knowledge/ideology by using the example of how female knowledge is distinctive from male knowledge through group affiliation and lived experience. It is however difficult to distinguish and identify which cultural norms are socially constructed, and which of them are not (Dant 2013). This perspective on knowledge is critical for this research as individuals of a collaborative platform may come from different countries and thus, have different cultural backgrounds. For example, this applies to one of the case studies of this research (SCP Roundtable) as the collaboration consists of memberships and individuals from countries all over Europe.

It is also important to understand the concept of knowledge construction from a constructivist perspective. Foucault's work on knowledge and power provides a holistic understanding of knowledge that stands in contrary to other definitions of knowledge. For Foucault power is constructed through knowledge that is accepted and considered as 'truth'. In this context, every individual produces knowledge through their actions and perceptions, which are at the same time different for each society (Foucault 2000). According to Foucault, different societies have different rules on how knowledge is created and accepted. These rules, which he refers to as 'general politics' and 'regimes of truth', are:

> "*the result of scientific institutions, and are reinforced (and redefined) constantly through the education system, the media, and the flux of political and economic ideologies. In this sense, the 'battle for truth' is not for some absolute truth that can be discovered and accepted, but is a battle about the rules according to which the true and false are separated and specific effects of power are attached to the true. A battle about the status of truth and the economic and political role it plays*" (Foucault 2000, p.132).

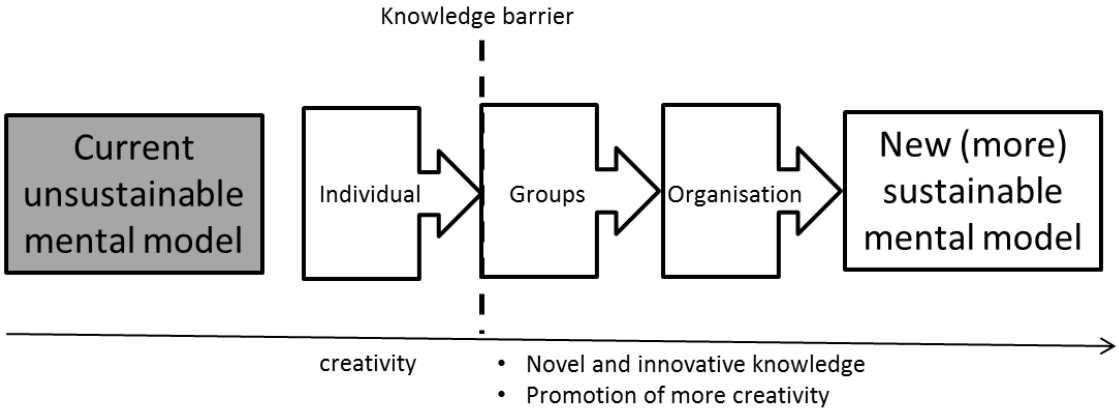
It is critical for this research to take this perspective on knowledge into consideration since the researcher has explored how collaborative knowledge is used within food sustainability. This must include the wider implications of that knowledge on the food system.

2.2.3 Collaborative learning in the context of sustainability through creativity

Scholars have pointed out the significance between creativity and the ability to learn collaboratively. This is based on the idea that emotions play a critical role in the exchange of knowledge. Lozano points out that creativity can play a key role in the promotion of knowledge that fosters sustainability. Creativity can be defined as the approach of problem solving through novel knowledge and skills that have not been previously learned (Mayer 1989; Sternberg and Lubart 1999). A critique of this position is that contemporary challenges in sustainable development are often regarded or analysed through knowledge that is not novel or innovative and thus, unable to solve complex sustainability problems (Lozano 2014). To endorse and transfer creativity, constant learning processes need to take place between all dimensions of a

collaboration. This includes the individual, group, and the mental model of a collaboration. Creativity can be useful to overcome knowledge barriers that may linger between the individual and group dimension. Creativity challenges the traditional mental model, which according to Lozano produces unsustainable outcomes. Consequently, the development of new (more) sustainable mental models (see Figure 2.4) needs to be developed with the presence of creativity (Lozano 2014).

Figure 2.4 Knowledge barrier and a new sustainable mental model



Source: Author after Lozano 2014

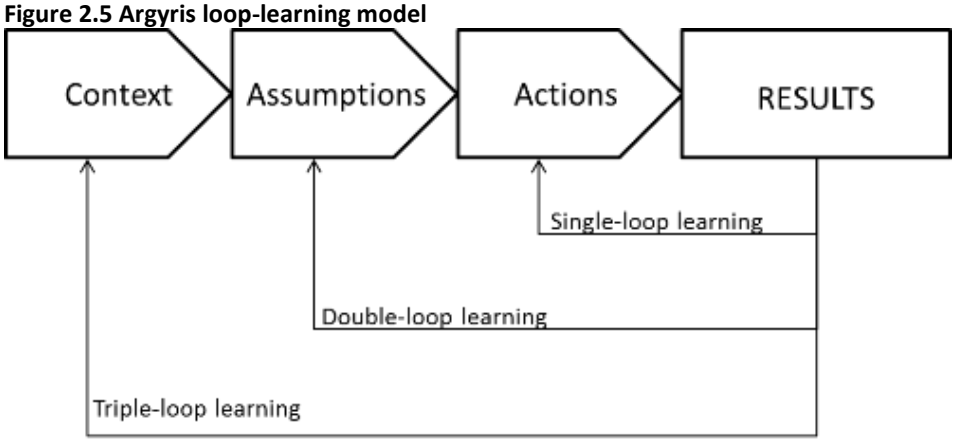
2.2.4 Adaptive-anticipatory-action-loop-learning

A traditional perspective on learning is linear and includes the three stages; knowing, understanding and applying (Lozano 2014). A linear model is, however, too narrow and simplistic to cover the complexity behind collaborative learning. With respect to the field of sustainable development a linear concept can be extended to a circular learning model, which includes constant feedback loops from the application to the knowing step, in the sense of 'learning by doing' (Posch and Steiner 2006). The literature distinguishes the three types of single- double- and triple-loop learning (see Figure 2.5) (Argyris and Schon 1974; Georges L. Romme and Van Witteloostuijn 1999; Anon and Smith 2000; Lozano 2014).

Single-loop learning occurs when a problem is identified and errors are corrected, by developing more effective problem-solving strategies (Innes and Booher 2000; Lozano 2014). Double-loop learning is a process of rethinking and reframing by questioning

whether policies or standards are appropriate and relevant for the emergence of a problem (Argyris 1991; Georges L. Romme and Van Witteloostuijn 1999; Anon and Smith 2000; Innes and Booher 2000). Triple-loop learning involves an additional stage where new processes, policies, standards, or concepts are not only questioned and reconsidered, but also developed and re-framed, in order to construct circumstances to prevent problems reoccurring (Argyris and Schon 1974; Georges L. Romme and Van Witteloostuijn 1999; Lozano 2014).

Figure 2.5 Argyris loop-learning model



Source: Author

Argyris' loop-learning model is a useful tool for this research, but it is criticised by authors, such as Doppelt as too simplistic for capturing the complexity that lies behind collaborative learning. Doppelt extended the loop-learning model and developed a concept which is relevant for this research as it focuses on sustainability (Doppelt 2009). The model is divided into adaptive, anticipator and action learning. Adaptive learning refers to a process in which actors aim to find a direct solution for a present problem. The anticipatory learning process is complex-creative and involves the development of methods and concepts which aim to prevent potential problems (Doppelt 2009). Action learning is described as a learning laboratory and it involves the conscious approach of learning out of problems or difficulties. This process involves the combination of experiences and ideas of individuals or groups with the aim of gaining and expanding knowledge (Doppelt 2009; Lozano 2014). The following tables (see Table 2.3 and Table 2.4) summarise the key characteristics of each learning typology after the work of Lozano (Lozano 2014).

Table 2.3 Learning typologies according to their loops and processes

PROCESSES	LOOP-LEARNING		
	Single	**Double**	**Triple**
Adaptive	Passive	Proactive	N/A
Anticipatory	Forecasting	Backcasting	Discerning
Action	Coaching	Experiential	Inquisitive

Source: Author after Lozano 2014, p.211

Table 2.4 Characteristics of learning typologies

Learning typologies	Characteristics
Passive	Increases knowledge and skills through schooling; Aiming to accomplish immediate tasks; No explanation is provided or needed; Little or no concerns on activities that could affect the present or future tasks
Forecasting	Increases knowledge and skills in preparation for future tasks and potential problems; No explanation is provided or needed; Little or no concerns on activities that could affect the present or future tasks
Coaching	Increases knowledge and skills through training; Aiming to accomplish immediate or future tasks and problems; Real-life practical problem solving; Little or no concerns on activities that could affect the present or future tasks
Proactive	Aims to find root causes through mental abstractions; Involves questioning of assumptions, policies and mental models; Future situations or mental models are not considered
Backcasting	Challenges mental models; Creation of future ideal scenarios and comparing them with current situations; Seeks to plan the changes needed to achieve these ideal scenarios
Experimental	Challenges mental models through real-life problem solving; Linking mental abstraction with a 'hands-on' approach
Triple-loop/adaptive	Not possible, since there is a contradiction between the development of new models that aim to re-frame circumstances and the approach of immediate problem-solving.
Discerning	Challenges mental models and concepts through abstractions; Developing new processes and methods that could be used for future problems
Inquisitive	Aims to develop new processes and methods through real-life problem solving; Challenges current mental models and support re-framing processes

Source: Author after Lozano, 2014

2.2.5 Collaborative learning through dialogue

This section looks at the literature in relation to dialogue within collaborative/collective structures. The literature points out that dialogue is a core element of collaboration and important for collaborative learning and creativity (Isaacs 1999; Innes and Booher 2000; Feldman et al. 2009; Innes and Booher 2010; Bohm 2013; Quick et al. 2015). Dialogue can also be regarded as essential in relation to governance for sustainable development and in environmental policy (Bäckstrand 2010). According to Lafferty "*any tensions*

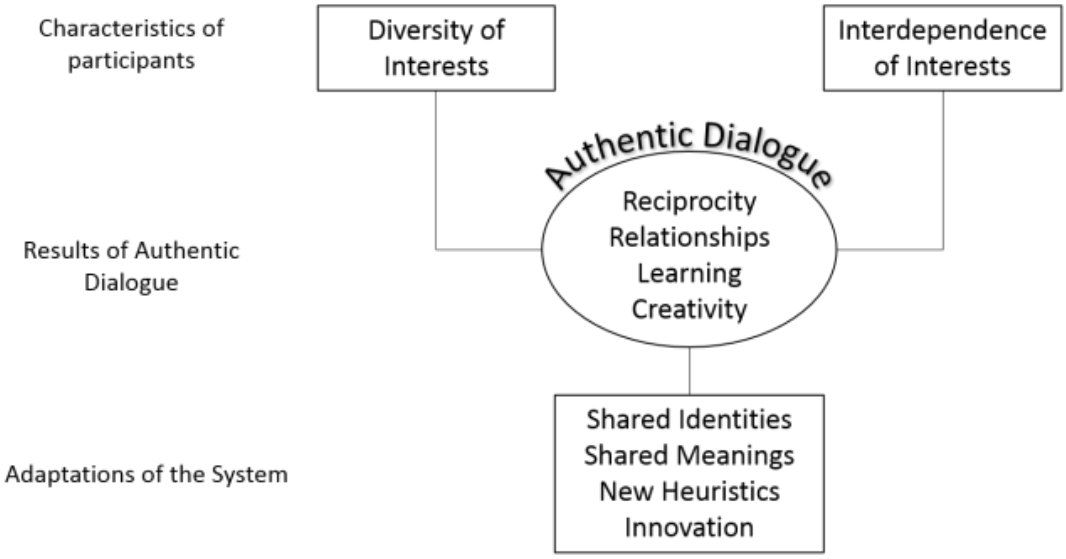
between the values and procedures of liberal-pluralist [`modern`] democracy and the values and goals of sustainable development can only be resolved through an open and empirically based dialogue" (Lafferty 2006, p.22). According to Innes and Booher, dialogue within collaboration refers to a genuine form of dialogue which is "*by nature more spontaneous and creative, less focused on a prior question and more broadly aimed at learning, evolution, and action*" (Innes and Booher 2010, p.121). This may evolve through structured and day-long dialogues where members are able to move on from vague ideas towards more complex and solid judgments. This openness can affect the collaboration, including learning and knowledge transfer activities. Dialogue can enhance mutual trust, which in return can make conversation easier and even lead to a transformation of beliefs and values. Dialogue is often described as a 'yes, that's it' effect when a member finally comes up with an idea or conclusion through the interaction with others (Innes and Booher 2000; Innes and Booher 2010). This kind of learning environment is also described by Nonaka as 'Ba', where members of a collaborative group experience true knowledge exchange (Nonaka 2006).

Storytelling and metaphors are part of a dialogue that can help to build up an identity for the collaboration and can motivate members to be proactive. Within collaborations, a battle between individuals can occur when an actor tries to tell a more convincing story or metaphor than their opponents. The storytelling and metaphors are only tools that support the expression of ideas, concepts and standpoints, which can lead to more of an adsorption of knowledge. However, storytelling empirically is unlikely to be the decisive tool in achieving actual breakthrough in finding a solution or agreement (Innes and Booher 2010). The perspective of Innes and Booher can be challenged by Amba, as the method of storytelling through ongoing dialogue can benefit organisational learning, which is the gaining of knowledge collaboratively (Abma 2003). It is therefore possible that storytelling can solve a problem or be challenging through the knowledge gained from its process. According to Innes and Booher the key process that is responsible for such a breakthrough happens through collective 'bricolage'.

‘Bricolage’ occurs where an end or goal is vaguely predefined and the reasoning approach within is not following a deduced approach. This collective end product will take shape through the process itself and through the availability of material and how it is connected. ‘Bricolage’ stands in contrast to the scientific approach, where the end product is clearly defined, and the goal is to reach that specific goal. A ‘bricoleur’ within a collaboration can help to extend the collective pool of policy ideas, experiences and documented materials (Innes and Booher 2010). After the ‘garbage can’ model of Cohen, individuals within a collaboration throughout their life collect policy ideas that are unused or not seen as relevant in former projects (Cohen et al. 1972). During the genuine dialogue, participants can contribute to the collective through the process of ‘bricolage’. At the same time, members can enter a stage where they modify their own repertoire which is influenced by other individuals that act as ‘bricoleurs’. Indeed, in a collaborative deadlock situation, the more likely participants are able to draw analogies from their collective repertoire within a creative environment, the more likely alternative strategies can be developed. Innes and Booher adds that to reach that point, individuals within a collective need time and a high level of trust and comfort. In addition, the integration of local knowledge into collaborative dialogues can be highly beneficial as local knowledge can be made more accessible to collaborations through brokers that are in close contact with the people that inherit local knowledge (Innes and Booher 2010).

Based on the key characteristics of a dialogue within collaborative structures, Innes and Booher developed a DIAD (diversity, interdependence, authentic dialogue) model of collaborative rationality (see Figure 2.6). The DIAD model implies there are three conditions that affect the results of the dialogue.

Figure 2.6 DIAD theory model



Source: Author's own figure after Innes and Booher 2010, p.35

The investigation of elements such as shared meanings or the diversity of interests can help in this research to understand factors that influence the dialogue and the collaborative learning of the food related collaborative platforms.

2.2.6 Multi-dimensional sustainability influence change memework

Learning and knowledge transfer on an individual basis within collaborative groups can be regarded as essential for the development of sustainable concepts. The following learning theory explores the literature of how individual learning of group members can benefit the collaboration towards a more collective mindset of sustainability (Bizer and Julich 1999; Lozano 2007; Pahl-Wostl et al. 2008; Doppelt 2009; Lozano 2014). According to Lozano, within organisational structures: "*the process of learning of and for sustainability should incorporate integral thinking of economic, environmental and social aspects, holistic and collaborative thinking, and short-term and long-term equilibria into their processes*" (Lozano 2008, p.506).

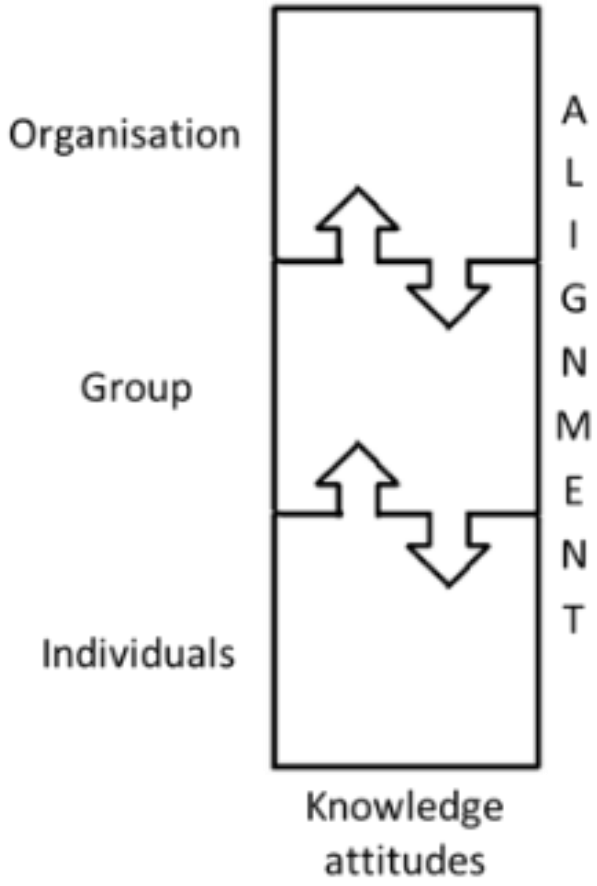
It is critical to be aware that learning within organisational structures only occurs through individuals, but individual learning does not necessarily imply collective learning (Simon 1991; Innes and Booher 2000; Lozano 2008). Even if learning takes place in the

physical brain of an individual, human learning in the collaborative context is influenced by organisational structures and processes (Simon 1991). The correlation that is pointed out by Lozano is that:

> "*organisational learning, through inter-personal and inter-group interactions, can facilitate group interactions, can facilitate group learning, and group learning in turn can facilitate individual learning, which facilitates group learning, which facilitates organisational learning*" (Lozano 2008, p.505).

Learning processes along these levels can be described as alignment (see Figure 2.7) (Senge 1991; Crossan et al. 1995; Lozano 2008).

Figure 2.7 Learning through alignment



Source: Author's own figure after Lozano 2008

Knight uses a similar approach that includes the creation of knowledge within a collaboration, as an entity can be influenced by an individual or group within that collaboration through intra-organisational interactions (see Table 2.5) (Knight 2002).

Table 2.5 Cross-tabulation level of learner and context of learning

Level of learner	*Individual*	*Group*	***Organisation***
Individual	Individual learns through interaction with another individual	Individual learns within a group	**Individual learns within an organisation**
Group	Group's learning is influenced by an individual	Group learns through intragroup interaction	**Group learns within an organisation**
Organisation	**Organisation's learning is influenced by an individual**	**Organisation's learning is influenced by a group**	**Organisation learns through intra-organisation interaction**

Source: Author's own table modified after Knight 2002

Knight's cross tabulation allows the drawing of a visual pattern, which shows the learning levels of a collaboration (Knight 2002). The example in Table 2.6 illustrates a collaboration that mainly learns through reciprocal group interactions and one-on-one sessions.

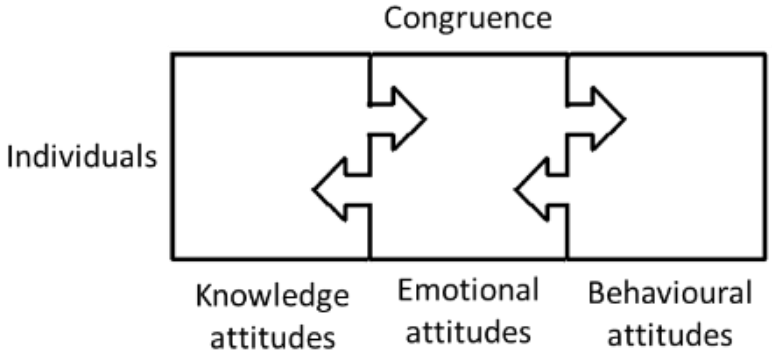
Table 2.6 Example of a learning cross tabulation

Level of learner	*Individual*	*Group*	***Organisation***
Individual	**X**	**/**	**/**
Group	**/**	**X**	**X**
Organisation	**/**	**X**	**/**

Source: Author

The process of translating knowledge into action is described as congruence. Congruence is a reciprocal process that is influenced by novel or inherent knowledge, emotional and behavioural attitudes (see Figure 2.8). This shows that even if an individual, group or organisation learned something on sustainability, this does not imply that an action follows based on the new knowledge (Lozano 2008). The aspect of congruence in this research is less about the change of individuals to become more knowledgeable on sustainability issues; it is more about individuals within a collaborative group to come forward with novel knowledge and apply that within internal collective activities, such as the writing of reports, using it in discussions or workshops. This applies not only to the individual, but also on a group and organisational level.

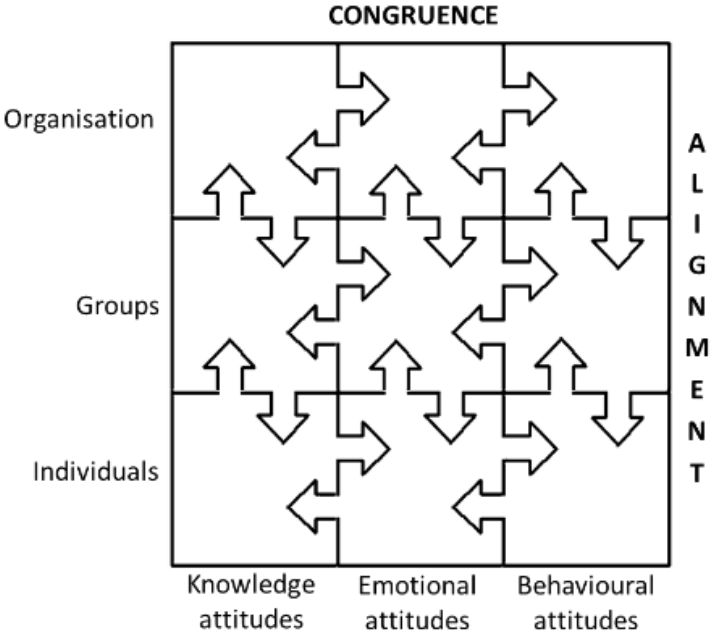
Figure 2.8 Individual internalisation of sustainability



Source: Author's own figure after Lozano 2008

Congruence on the group level includes the internalisation and inter-relatedness amongst the collective and its individuals. Congruence can occur along all three dimensions since the concept of alignment connects all levels. This organisational learning model is defined as Multi-Dimensional Sustainability Influence Change Memework (MuSIC) (see Figure 2.9) (Lozano 2008).

Figure 2.9 Multi-Dimensional Sustainability Influence Change Memework



Source: Author's figure after Lozano 2008

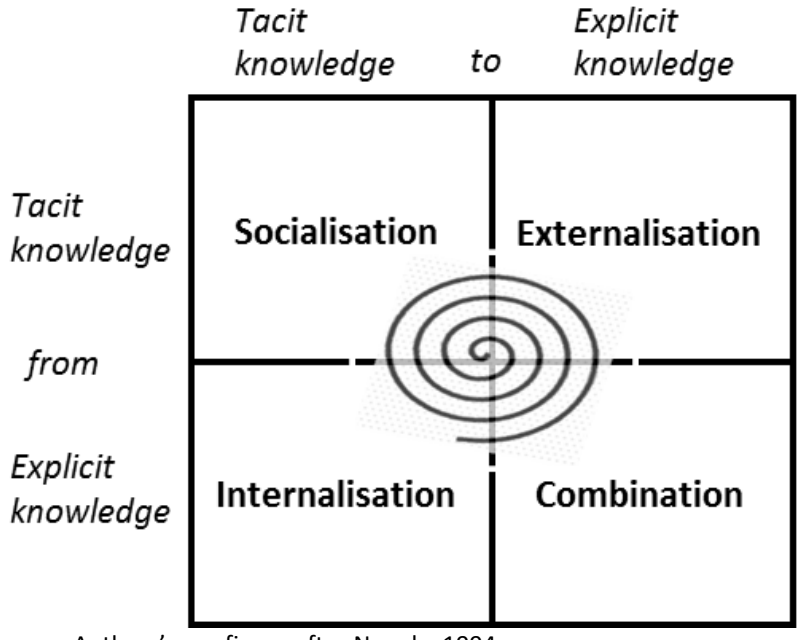
It is important to note that in large collaborative groups the behavioural effect on its individuals can often be filtered through groups. The MuSIC memework should

therefore be seen as a closed system, where each level and process are connected. This process in which knowledge on sustainability results in concrete actions is a time consuming long-term process for collaborative groups (Lozano 2008; Doppelt 2009).

2.2.7 Nonaka's knowledge spiral

The creation of knowledge and the knowledge flow within collaboration can be regarded as a constantly active and changing process. Nonaka developed a knowledge spiral model that is applicable to collaborative structures. The model can be useful to understand the stage at which newly created knowledge is located within the collective mindset of a collaboration, as Nonaka's model puts different dimensions of knowledge in relation to each other (see Figure 2.10). These dimensions can be regarded as different mental stages amongst individuals of a collaborative platform that can lead to organisational learning.

Figure 2.10 Nonaka's knowledge spiral



Source: Authors' own figure after Nonaka 1994

Socialisation is the first stage and consists of weak tacit knowledge flows amongst members within a collaboration. In this context, knowledge transfer can be understood

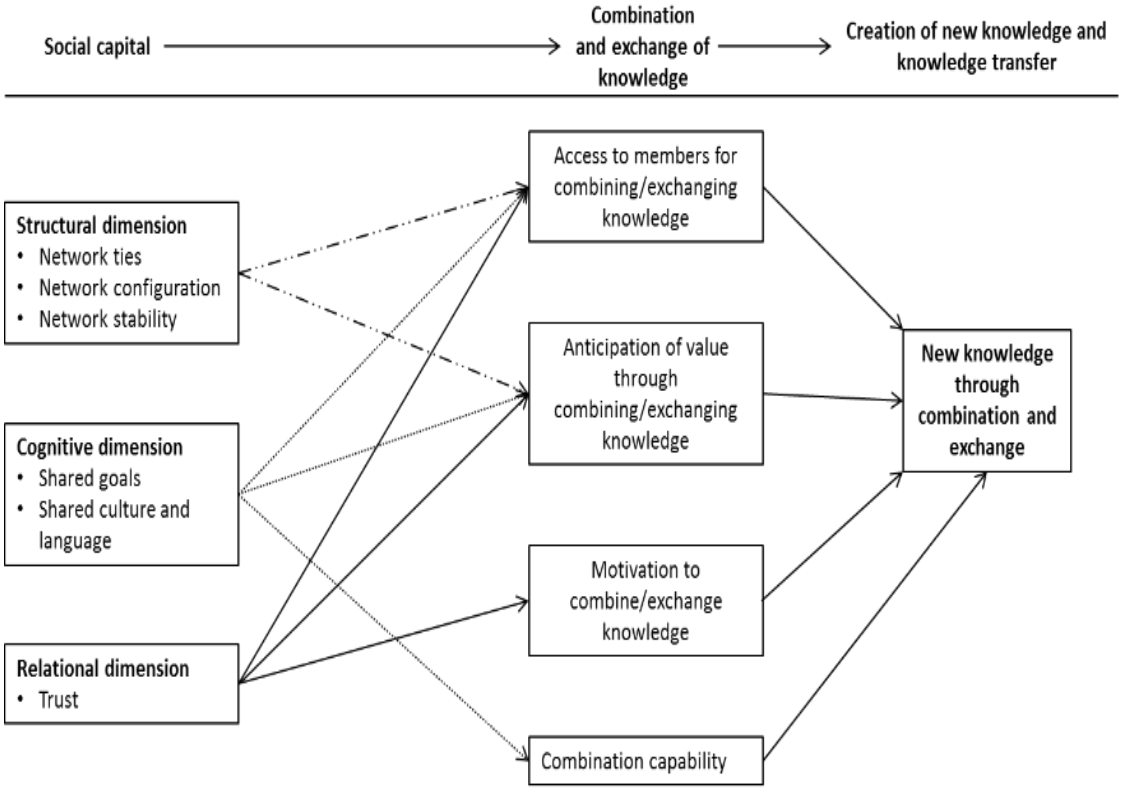
as experience sharing, observing, imitating, or brainstorming between members. This form of knowledge transfer is mainly described as an unconscious process without the use of language. The second stage is externalisation, where tacit forms of knowledge from the socialisation stage and becomes explicit knowledge. Externalisation consists therefore of conscious processes that include the writing down of novel knowledge, the creation of metaphors and analogies.

The third stage is combination, where multiple explicit knowledge forms are consciously combined and categorised to more concrete forms of explicit novel knowledge. This combination can again occur through a socialisation processes, such as through meetings or conversations between members and groups of a collaboration. The last stage of Nonaka's knowledge spiral is the internalisation stage. Internalisation is a learning processes, where explicit knowledge that forms the combination stage is converted to tacit knowledge. Explicit knowledge can become established within a collaboration and it can be seen as an every-day element of the knowledge pool. Internalisation is therefore a process where established explicit knowledge is converted and codified to tacit knowledge forms. This tacit knowledge is mainly expressed through action-based processes of newly acquired knowledge (Nonaka 1994; Nonaka 2006).

2.2.8 Social capital and the creation of knowledge within collaboration

Nahapiet and Ghoshal have developed a model of collaborative knowledge transfer that takes social capital into account (Nahapiet and Ghoshal 1998). Collaborative platforms, including those in the food system can be described through structural, cognitive and relational dimensions. These dimensions can assists the creation of new collective knowledge (see Figure 2.11) (Nahapiet and Ghoshal 1998; Inkpen and Tsang 2005).

Figure 2.11 The impact of social capital on knowledge creation and transfer



Source: Author's own figure after Nahapiet and Ghoshal 1998; Inkpen and Tsang 2005

In this research the definition of social capital of a collaboration is the aggregate set of valuable resources that are "*embedded within, available through, and derived from the network of relationships possessed by an individual or organisation*" (Inkpen and Tsang 2005, p.150f.). Thus, social capital within collaborative structures can be tangible, such as the number of network ties between members, or clearly defined common goals. Social capital can also be intangible, for example in the form of trust or culture. Engendering trust among partners raises their willingness to move forward, despite the fact that uncertainty in the relationship may remain (Nahapiet and Ghoshal 1998; Inkpen and Tsang 2005).

Within the structural dimension, network ties describe the relationship between the partners. These ties are important to create a positive social environment both formally and informally. Network configuration can influence the ability to learn and create new knowledge through symmetrical and asymmetrical actor constellations. Collaborations

with strong and multiple ties have significantly stronger mechanisms of knowledge transfer than those with weak ties. The ability of the network to create new knowledge is stronger within non-hierarchical (symmetrical) and non-competitive network configurations (also see Section 2.1.6). Network stability (or, the change of membership and actor constellation) determines the opportunity for creating social capital. Partners that leave a collaboration abruptly are likely to cause a loss and change to network ties. A strong stable network is beneficial for the number and quality of network ties that are vital for new knowledge creation (Nahapiet and Ghoshal 1998; Simonin 2004; Inkpen and Tsang 2005). Furthermore, collaborative platforms cannot be seen as constant, static or long term since the actor constellations change over time. Thus, it is necessary to see collaborations as dynamic systems with a changing character, rather than a constant entity (Pellicelli 2003). The relationship between members and a network ties are described through the relational dimension (Nahapiet and Ghoshal 1998; Inkpen and Tsang 2005).

The cognitive dimension is expressed through a shared meaning and belief system among partners. A shared culture determines the acceptance of norms, modalities, or behaviour relationships between collaborators. A shared culture can benefit processes of developing novel knowledge, since a shared understanding and belief system can avoid socio-cultural difficulties. The existence of a shared culture within a collaboration can limit the ability to learn more, as members may be unwilling to adapt mechanisms that are outside of a certain belief system even though they may be more efficient (Nahapiet and Ghoshal 1998; Inkpen and Tsang 2005).

Rayner (2012) describes this aspect as ‘uncomfortable knowledge’, where certain knowledge that stays in contrary to a certain belief system or mindset is excluded from a knowledge pool. Rayner describes how the exclusion of knowledge is done through the four implicit strategies of denial, dismissal, diversion and displacement. Denial involves a way of thinking where uncomfortable knowledge is not even available. The strategy of dismissal rejects certain knowledge with an awareness of the existence of that uncomfortable knowledge. Diversion is described as an organisational strategy in

which the attention from certain knowledge is distracted through decoy activities, so that this particular knowledge is not created or shared. Displacement refers to an object, such as a computer model or an activity that aims to inform real-world circumstances by substituting certain knowledge forms 'automatically', that would otherwise appear to be more complex, with more manageable knowledge forms. The consequence of displacement can be that certain knowledge is not recognised because of the way in which certain models and activities are structured and organised (Rayner 2012). Rayners concludes that:

> "*'clumsy' arrangements may need to be constructed to ensure that uncomfortable knowledge is not excluded from policy debates, especially when dealing with 'wicked problems' where the accepted version excludes knowledge that is crucial for making sense of and addressing the problem*" (Rayner 2012, p.107).

Food related collaborative platforms can often function as 'clumsy arrangements', as they can have the ability to decide which knowledge is regarded as true and which is less favourable and excluded from the knowledge pool of a policy. Particularly the ability to exclude certain knowledge from a policy is regarded as the most important mechanism of power (Persson 2013).

2.3 Knowledge in policy

The following section outlines theories and concepts in relation to collaborative platforms and their role as knowledge providers in policy. The literature on this topic is critical for this research since one of the research objectives revolves around the impact that food related collaborative platforms have through their knowledge. This research focuses on the impact of collaborative knowledge on food sustainability.

There has been some empirical research carried out on the role of policy advisory groups, such as think tanks or consultancy groups and their role in policy making (Haas 1992; Maloney et al. 1994; Bryant 2002; Rich 2005; Raffel 2006; Richardson 2006; Funke 2013). New institutionalist organisation theory distinguishes the three ideal-typical institutional pillars as regulative, normative and cognitive. These pillars are used to describe the organisation of advisory arrangements (Scott 2008). The regulative pillar describes how advisory arrangements are formalised through laws, work manuals, or organisational decrees. The normative pillar refers to norms, values, and expectations that are associated with the advisory arrangement (Hustedt 2013). The cognitive pillar analyses the dominant "*worldviews on and shared meanings of policy advisory arrangements which are taken for granted by actors*" (Hustedt 2013, p.45). The provision and trade of knowledge for policy advice is central within advisory arrangements and for Persson "*the mechanisms that make certain knowledge true and which exclude other knowledge from the same position are what Foucault defines as power*" (Persson 2013, p.26).

In some cases, collaborative platforms have governmental actors involved as a participant or observer. Such constellations suggest a knowledge impact from the collaborative platform to the governmental institution. It is therefore important for this research to understand the relationship between the collaboration as a knowledge provider and the governmental institution(s) that are embedded as participants, observers, or chairman. Thus, in this research food related collaborative platforms can be regarded through the following six concepts, models and frameworks:

I) Knowledge providers and users in policy
II) Types of knowledge and their use by policy actors
III) Collaborative policy groups and their role as epistemic communities
IV) Punctuated equilibrium / Interest groups and issue networks
V) The aspect of agenda setting
VI) Bryant's knowledge policy- change model

2.3.1 Knowledge providers and users in policy

This section outlines the role of knowledge within the process of policy development and implementation. This research is interested in the way knowledge is used actively and passively by policy makers. Policy makers are those actors that develop policy and thus, use or reject certain knowledge in their process of policy making.

According to Lindberg, "*knowledge plays an important role in policy change and, more emphatically, political processes and policy change cannot be understood if you exclude the concepts of knowledge and learning as explanations*" (Lindberg 2013, p.1). A technocratic and positivist perspective on this is the concept of evidence-based policy making. According to Innes, evidence-based policy can be described as an environment where "*policy makers should use formal information, such as statistics or the findings of social science, to aid their decisions in a way analogous to how a scientist tests a hypothesis and is persuaded by the evidence of carefully designed experiments*" (Innes 1990, p.3). As pointed out earlier in Chapter two, there is no real neutral knowledge. Knowledge creators, such as scientists are consciously or unwillingly influencing what is regarded by others as valuable or true (Weingart 1999; Hoppe 2005).

Even if certain knowledge is regarded as truth or seen as scientific by a society, policy makers might not consider such knowledge for their decision-making processes. According to Weiss the reason for this might be that practical policy issues are broad and complex (Weiss 1979) and "*formal research is normally designed in a way that does*

not mesh with the policy makers frame of reference nor reflect policy makers assumptions, values or priorities, but rather applies theories in the field" (Innes and Booher 2010, p.145). There is empirical evidence of policy makers that use research findings and include novel knowledge in their decision making processes (Weiss 1979; Weingart 1999; Hustedt 2013; Lindberg 2013). Weiss identified six types of policy and decision makers that make use of research and novel knowledge (Weiss 1977).

Table 2.7 Types of knowledge utilisation in policy making

Type #	Type name	Utilisation in policy making
I)	knowledge-driven	Research findings are essential for policy making and new knowledge should be the driver for new policy implementations.
II)	problem-solving	Policy makers choose certain knowledge that focuses on contemporary policy challenges and problems.
III)	political	Evidence-informed policy, where policy makers choose knowledge that reflects their position and beliefs.
IV)	tactical	Policy makers are initiators of research that reflects their interests and position.
V)	enlightenment	Knowledge use by policy makers with the aim to challenge the status quo.
VI)	interactive	Most relevant concept for this research, as it describes a collaborative approach of knowledge creation and selection.

Source: Author after (Weiss 1977)

Table 2.7 illustrates a wide spectrum but fails to recognise cross-cutting and borderline situations. The use of certain types of knowledge by policy makers can be underpinned by a variety of motives. Stevens argues that not only policy makers but also powerful pressure groups can have the power and resources to promote and develop certain knowledge that reflects their beliefs (Stevens 2007). A relevant concept for this research is the interactions within a group that can be described as:

> "joint efforts among social scientists, administrators, practitioners, clients, interest groups and so forth, working on a poorly defined policy issue, where knowledge is lacking or contradictory and ends are not well specified" (Innes and Booher 2010, p.147ff.).

Weiss argues that for many policy makers challenging the status quo is important for their choice of knowledge use rather than quality or conformity. Knowledge or research that has a 'shock' or sensational effect can be powerful for policy makers in the bargaining process (Weiss 1977; Weiss 1979; Innes and Booher 2010). According to Hustedt, a more diverse and multi-causal approach on the role of knowledge in policy making should be taken. In particular he noted that new emerging policy fields, such as climate change are highly technical and thus, are likely to be driven by novel knowledge-driven than other policy fields (Hustedt 2013).

Jasanoff goes one step further to argue that knowledge providers, such as science advisors have such a strong impact on policy making that they can be seen as a separate governing body (Jasanoff and Jasanoff 2004; Hustedt 2013). Hoppe argues that researchers often have self-fulfilled interests when providing knowledge to policy makers, or certain indicates that they can have their own tactics depending on who is financially supporting the research (Hoppe 2005).

The relationship between knowledge provider, such as collaborative platforms and policy maker can also be regarded from the knowledge/researcher position. A useful classification on this is based on the work of Pielke who outlined four types of knowledge providers in the context of policy making (see Table 2.8).

Table 2.8 Type of knowledge providers in the policy making context

Type of knowledge provider	Role in policy making
The Pure Scientist	No interaction with policy makers. Aims to focus on facts only
The Science Arbiter	Provides answers to specific questions posed by the policy maker
The Issue Advocate	Aims to reduce the available options to the policy maker
The Honest Broker of Policy Options	Aims to expand and or clarify, the scope of options available to the policy maker

Source: Author after (Pielke 2007)

Similar to Weiss's classification, Piekle outlines a useful framework of knowledge providers in the context of policy making. It is important for this research to emphasise that these classifications need to be seen as overlapping and combined, as a researcher might provide knowledge based on a mix of motives. Since the classifications by Piekle and Weiss outline knowledge provider/creator (researcher) and knowledge recipient (policy/decision maker), it is possible to connect some aspects of both concepts in one table (see Table 2.9).

Table 2.9 Categories of relationships between Knowledge provider and policy maker

(Weiss 1977)	(Pielke 2007)
Knowledge-driven Research findings are essential for policy making and new knowledge should be the driving force new policy implementations	**The Pure Scientist** No interaction with policy makers. Aims to focus on facts only
Problem-solving Policy makers choose certain knowledge that focuses on contemporary policy challenges and problems	**The Science Arbiter** Provides answer to specific questions posed by the policy maker **The Issue Advocate** Aims to reduce the available options to the policy maker
Political Evidence-informed policy, where policy makers choose knowledge that reflects their position and beliefs	
Tactical Policy makers are initiators of research that reflects their interests and position	
Interactive Collaborative multi-actor approach of knowledge creation and selections. Aims to clarify policy areas of knowledge deficiency	**The Honest Broker of Policy Options** Aims to expand and or clarify, the scope of options available to the policy maker

Source: Author after (Weiss 1977; Pielke 2007)

The arrows in Table 2.9 indicate that these classifications need to be seen as a spectrum rather than single isolated types of knowledge producer/recipient. This spectrum can be linked to collaborative platforms to explore their collaborative learning and knowledge sharing through a variety of categories.

Scholars such as Sutherland et al. argue that particularly the science policy interaction has become widely recognised as an approach of evidence-based policy making. It got even to a point were scientific authority has become an important element in policy making with many scientists being in senior positions when it comes to public policy making. Sutherland et al. also point towards policy makers and the lack of understanding when it comes to the use of science in policy. For them:

> "*the science-policy relationship is sometimes difficult and occasionally dysfunctional; it is also increasingly visible, because it must deal with contentious issues, or itself becomes a matter of public controversy, or both* (Sutherland et al. 2012, p.1)"

According to Karlson there has been a shift in the last century from ideological policy making towards more pragmatic policy making with particular focus on knowledge and cognitive capacity (Karlson 2013). For Innes and Booher, the legitimacy of political actions depends significantly on how knowledge is used for the justification of actions and how these justifications are accepted by the public (Innes and Booher 2010). Current political movements, governments and policy goals can play a significant role in relation to knowledge perceptions. This includes what is deemed to be relevant and what is used to promote policy making. This also implies the exclusion of knowledge that suggests contrary policies. The way knowledge is understood and used strongly depends on the knowledge user and the methodology of knowledge access. How and why policy makers use certain sets of rules and gather and organise certain knowledge can be crucial if we are to understand their approach of influencing and convincing others (Weiss 1977; Weiss 1979; Innes 1990; Parsons 2002; Taylor 2006; Stevens 2007). Collaborative platforms and collaborative activities can be seen as one specific source of knowledge for policy makers. It is important to take into account that in today's policy making process, knowledge gathering is often based on the understanding of what is defined as valuable and true knowledge rather than a critical analysis considering the nature of knowledge (Persson 2013).

2.3.2 Types of knowledge and their use by policy actors

This section explores the literature on the types of knowledge that are seen as relevant in policy making. Even though it is difficult to fully comprehend the impact that certain knowledge has had on the development or implementation of a policy, a strong academic debate has emerged around the importance of tangible and quantifiable ''scientific knowledge''. The main focus within most collaborative platforms in the area

of food, environment or climate change has been on ‘‘scientific knowledge’’ (Hoppe 2005; Jasanoff 2009; Innes and Booher 2010). It is notable that science has become a preferred and almost standard form of knowledge for evidence-based policy making. Scholars such as Sutherland et al. point out that this close relationship between policy and science is present but not well understood. They claim in particular that policy makers are often disconnected from the science and struggle to understand scientists (Sutherland et al. 2012).

For scholars such as Stirling et al. who have looked at the interface between genetically modified food, policy and knowledge one cannot simply assume that policy is always evidence-based. Even though it appears that policy is led by science and evidence there is a danger of misrepresentation. Stirling et al. argue that:

> *“it is often implied that policy judgments about, for example, the regulation of GE can and should be based on, and only on, scientific considerations. This ignores a longstanding body of analysis that argues that science on its own can never determine policy decisions. Mountains of evidence show that regulatory policies have never been based solely on science. Nor could they be; as analytic philosophers like to say, you cannot derive an “ought” from an “is” (Stirling et al. 2015, p. 24).”*

Knowledge that considers past and future processes, including bureaucratic and Inside-knowledge is a second type of knowledge. This includes formal knowledge of how public institutions work and operate, but also informal knowledge about non-codified processes and knowledge on how to address a concrete issue. Experience-based knowledge, such as descriptive statistics can be influential in almost all areas of policy making (Karlson 2013). Regulatory and bureaucratic agencies rely on both informal knowledge and scientifically accepted formal knowledge. Informal knowledge implies insider expertise on actors and circumstances that are regulated, including best practices on how to implement these regulations in a certain field. A major aspect especially in western democratic countries is knowledge on the politics itself. This involves knowledge on how a proposed policy or legislation is potentially affecting public actors and circumstances within a policy landscape (Radaelli 1999; Stone 1999; Peters, Falk, Guy 2002; Innes and Booher 2010).

Actor related knowledge can help to gain an understanding on the general political environment within a certain sector (Innes and Booher 2010). Within collaborative structures, stories and anecdotes can be useful tools to express knowledge that is difficult to quantify or express. There is a potential risk that local knowledge is ignored especially if that knowledge comes from disadvantaged groups or ethnic minorities. In some cases, qualitative knowledge expressed through stories, cultural rituals or experience can have a more convincing effect in policy making than ‘‘scientific knowledge’’ (Innes and Booher 2010).

2.3.3 Collaborative policy groups and their role as epistemic communities

There are a number of scholars that have pointed out the relevance of epistemic communities in the field of environment and social politics (Haas 1992; Stone 2000; Zito 2001; Maxwell and Stone 2004; Chilvers 2008). According to Haas “*an epistemic community is a network of professionals with recognised expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that domain or issue-area*” (Haas 1992, p.3). Innes and Boor describe this circumstance as a situation where stakeholders, such as think tanks try to ‘sell’ their knowledge to policy makers (Innes and Booher 2010).

For Haas, an epistemic community can consist of multidisciplinary members that have shared normative and principled beliefs. Epistemic communities have shared causal beliefs which are important to identify possible linkages between policy actions and desired outcomes based on a central set of problems. Shared notions of validity can be “*intersubjective, internally defined criteria for weighing and validation knowledge in the domain of their expertise*” (Haas 1992, p.3). Epistemic communities have often a common policy enterprise, which describes a set of common practices that are linked to a set of relevant problems for the members (Haas 1992; Stone 2008). Created novel knowledge is seen as an important element through which epistemic communities shape and influence policy and decision-making processes. Haas argues “*that control*

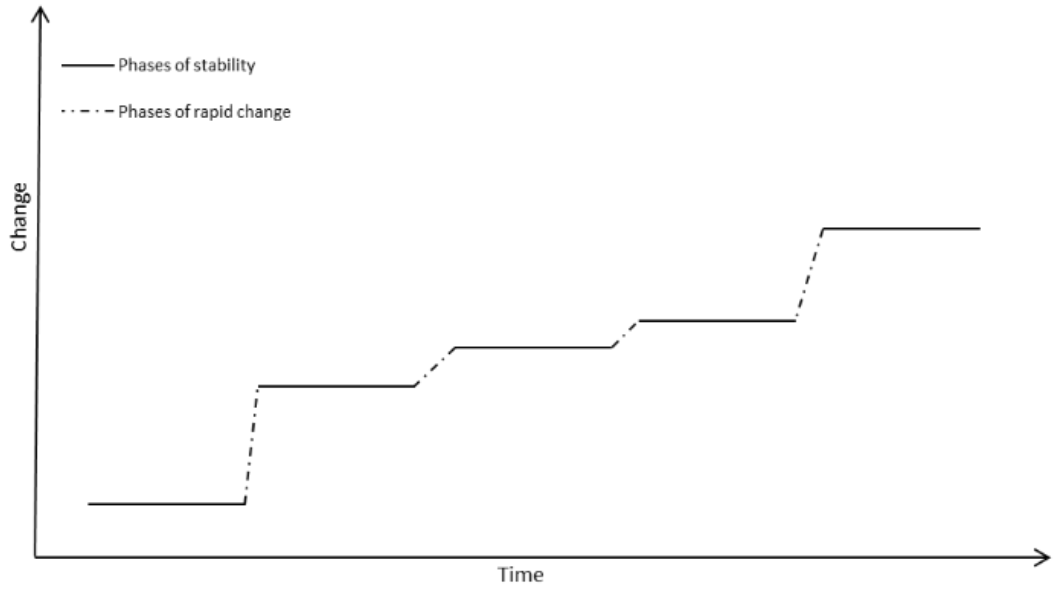
over knowledge and information is an important dimension of power and that the diffusion of new ideas and information can lead to new patterns of behaviour and prove to be an important determinant of international policy coordination" (Haas 1992, p.2f.).

Epistemic communities can have the ability to articulate the cause-and-effect relationship of complex problems through which they can support policy and decision makers to identify their interests (Haas 1992; Maxwell and Stone 2004). Epistemic communities can do this directly by advising decision makers, or indirectly "*by illuminating the salient dimensions of an issue from which the decision makers may then deduce their interests*" (Haas 1992, p.4). The concepts of epistemic community are applicable to food policy as shown by Hopkins who investigated the rise of an epistemic community in the international food aid regime. According to Hopkins, over the years "*epistemic community members have undertaken extensive analyses of the effects of food aid and of the nutritional needs of recipient countries* " (Hopkins 1992, p.226).

2.3.4 Punctuated equilibrium / Interest groups and issue networks

Jones and Baumgartner (2012) argue that most policies mainly remain the same with minor variations. They explain this through the growing complexity of many policy fields, such as food policy and the cognitive limits of policy and decision makers to comprehend the complexity. This results in a lack of attention, which practically can lead to policy making processes that are mainly based on former experiences of former policy making. These policies do not include any novel input and therefore some policies do not change over time. For example, a lack of external criticism and scrutiny on certain policy challenges and policy field can be a reason for the continuity of policies (Jones and Baumgartner 2012). Over time through the provocation of key events quick and dramatic policy change can occur (see Figure 2.12).

Figure 2.12 Punctuated equilibrium



Source: Author

The theory of punctuated equilibrium is based on Baumgartner and Jones, and describes phases of "*long periods of policy stability punctuated by short but intense periods of change*" (Cairney 2012, p.175). The expression of 'punctuation' refers "*to a policy change associated with: the use of a competing policy image to mobilise previously uninvolved actors, and imbalances between competing political forces*" (Cairney 2012, p.177; Jones and Baumgartner 2012). The term 'equilibrium' in public policy "*is the result of: dominance within government based on a supporting policy image and the enforcement of the status quo: and political forces cancelling each other out*" (Cairney 2012, p.177).

To understand these mechanisms, Baumgartner and Jones analysed the impact of policy communities on agenda setting. Policy communities are "*close relationships between interest groups and public officials, based on the exchange of information for influence*" (Cairney 2012, p.176). These interest groups consist of stakeholders from industry and civil society (Cairney 2012; Jones and Baumgartner 2012). Interest groups can also be involved in issue networks where interest groups and public officials have 'loose' relationships. An issue network can consist of large numbers of participants but the threshold for becoming a participant is low. The consultation between the interest

groups and public officials can vary depending on frequency and quality. The nature of interaction is less stable, and the access fluctuates significantly in comparison to policy communities. The biggest difference between a policy community and an issue network is that conflict and oppositions are more likely to happen in issue networks, even under the achievement of an agreement (Marsh and Rhodes 2002).

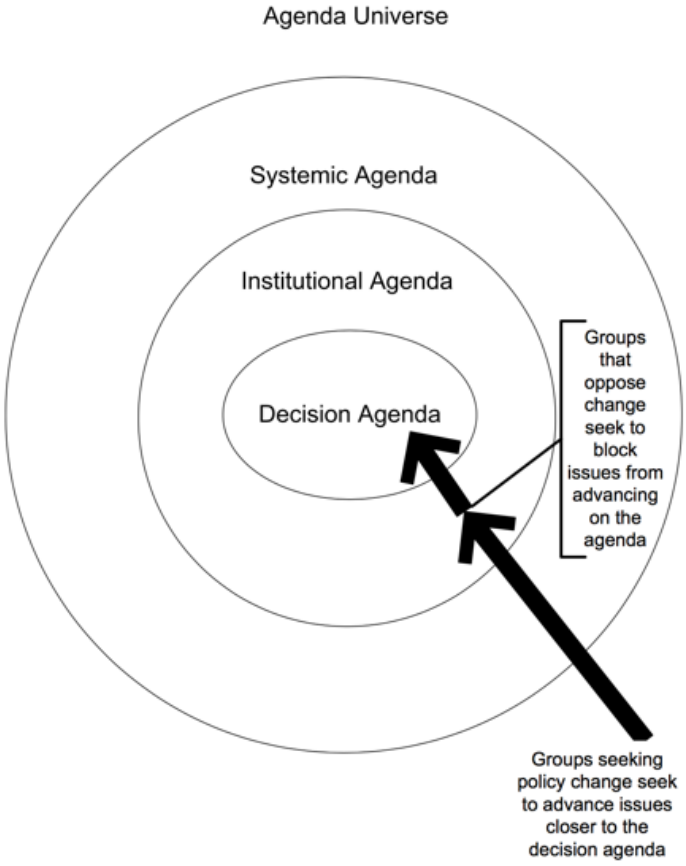
2.3.5 The aspect of agenda setting

Agenda setting is relevant for understanding how interest groups, such as food related collaborative platforms can become engaged in shaping policy agenda through knowledge. Agendas are critical at all levels of government from local to national and international, since there are always topics and issues that are available for discussion (Birkland 2007). Agenda setting can be understood as "*the study of public, media and government attention to policy issues*" (Cairney 2012, p.176).

A more useful understanding of agenda setting in the policy context is provided by Birkland who describes agenda setting as "*the process by which problems and alternative solutions gain or lose public and elite attention*" (Birkland 2007, p.63). An agenda itself can be regarded as "*a collection of problems, understandings of causes, symbols, solutions, and other elements of public problems that come to the attention of members of the public and their governmental officials*" (Birkland 2007, p.63). Phases of high attention can occur through a rise of a crisis or 'triggering event'. Interest groups can play an important role in agenda setting, as they can raise attention to a certain policy issue though their knowledge output. This is linked to the process of problem definition and policy framing which occurs "*when the flows of information indicate that a situation is worthy of governmental attention*" (Jones and Baumgartner 2012, p.6). For Cook et al. it is not only one single actor, such as the media or an interest group, that is responsible for agenda setting in policy. According to their investigation on media and agenda setting, it is a collaborative interaction between government staff members and journalists who are responsible (Cook et al. 1983).

Agenda setting is a complex process, and many elements need to come together to ultimately set or change 'the agenda'. Birkland uses a similar understanding to Sabatier's advocacy coalition regarding agenda setting in the policy context. An advocacy coalition is a specialist group of "*actors from a variety of public and private organisations who are actively concerned with a policy problem or issue such as air pollution control, mental health, or surface transportation*" (Sabatier 1988, p.131). These coalitions can consist of people from different backgrounds who share a particular set of values (Cairney 2012). Different advocacy coalitions compete against each other with the aim of influencing the creation of policies in their favour based on their core beliefs. Birkland argues similarly, that it is impossible for any individual or organisation to be familiar with all available knowledge, due to the physical limitation of the human brain and knowledge storage capacity. He concluded that this fosters a competition in the policy environment between interest groups that aim to influence or set an agenda. The motivation of setting the agenda is not only to gain influence and power; actors who set or influence the agenda often find the solution to the problems on issues they raised (Birkland 2007). A useful model to consider is Birkland's model on the different levels of agenda in relation to groups that aim to influence or set those agenda (see Figure 2.13).

Figure 2.13 Levels of Agenda and interest groups



Source: (Birkland 2007, p.64)

The model consists of four types of agenda levels; universe, systemic, institutional, and decision. The agenda universe is the largest pool of possible agendas that can be raised within a political system. The systemic agenda is a smaller pool and "*consists of all issues that are commonly perceived by members of the political community as meriting public attention and as involving matters within the legitimate jurisdiction of existing governmental authority*" (Cobb 1983, p.85). The institutional agenda contains only a limited number of topics that have a pinpointed focus. This agenda is considered highly by policy and decision makers and only a small number of topics can make it onto the institutional agenda. The content within the institutional level has been set up from a bigger pool as a result of limited resources and time that is available to a governmental institute (Hilgartner and Bosk 1988; O'Toole 1997; Birkland 2007). The decision agenda describes the most explicit level of agenda content that is of high interest for a governmental body.

Within a decision agenda, there is often an ongoing and expanding conflict between various interest groups. The primary focus of these groups is to move topics from the systemic to the institutional agenda, or to prevent the shift of certain issues to the institutional agenda (Birkland 2007).

The shifts in agenda setting outlined by Baumgartner and Jones can be linked to what is called a venue shift. This occurs where more than one governmental institution can become interested or responsible for a certain policy issue after a high level of attention has been cultivated around this policy issue. For example, heightened interest in the quality of meat and the sourcing of meat can shift attention and agenda setting towards various institutions, including the departments responsible for agriculture, environment, economic affairs and health. Additionally, during phases of rapid change there are also interest groups excluded from policy networks who do not participate in agenda setting. These groups can have the opportunity to become involved through questioning the current approach of problem solving and formulating their concerns and alternatives to public officials and the general public. Excluded groups may also 'shop around' to other governmental institutions (venue shopping) who are able to make a decision on the same policy issue (Baumgartner and Jones 2010). Thus, excluded interest groups can cause "*external attention rises and the issues are considered in a broader political environment where power is more evenly spread and new actors can set the agenda*" (Cairney 2012, p.177). It is worth mentioning that based on empirical operations some groups are more likely to influence an agenda than others, even though they might not have the most convincing arguments. It is more about the ability and power of a group to strategically influence the outcomes of policy debates (Birkland 2007).

Baumgartner and Jones also refer to the term 'parallel processing', which occurs "*when many issues are considered at one time by component parts of a larger organisation*" (Cairney 2012, p.182). Parallel processing describes a scenario where policy making is split into smaller entities of policy communities that are specialised in a certain field

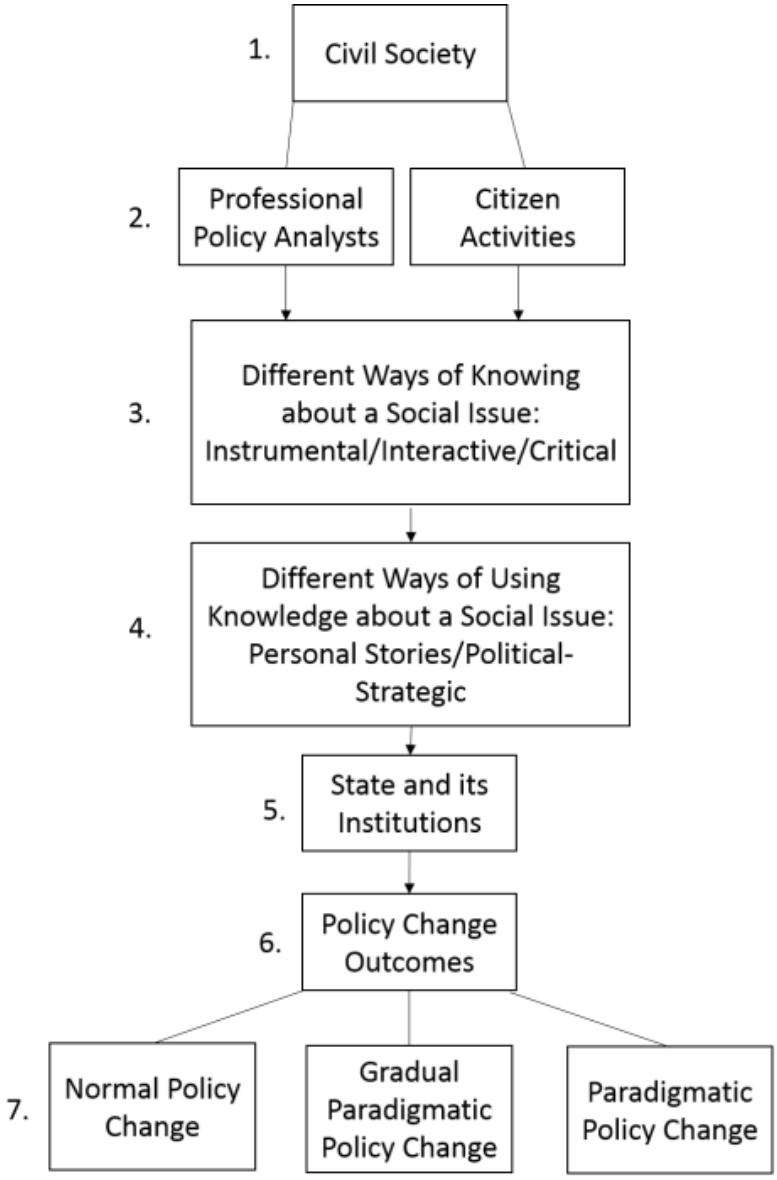
(Baumgartner and Jones 2010). Knowledge plays a vital role within these specialised policy communities as they "*process technical issues at a level of government not particularly visible to the public, and with minimal involvement from senior decision makers*" (Cairney 2012, p.182; Jones and Baumgartner 2012).

During this process, a shared belief system and common culture can have a positive effect within collective structures in policy (Cairney 2012). In contrast, group-government arrangements can also come to an end as a response of changing policies. This is linked to the thought process of Baumgartner and Jones where they argue that relationships are not constant, as they are embedded in dynamic processes (Baumgartner and Jones 2010). These non-constant arrangements lead to a shift from parallel processing at a low level of government, to serial processing at the highest level (Cairney 2012). Thus, contrary to parallel processing, serial processing occurs when only a few issues are considered at a time (Cairney 2012).

2.3.6 Bryant's knowledge policy-change model

Bryant's policy-change model outlines how knowledge could be embedded into policy and a decision-making process (see Figure 2.14). This model is based on the policy field of public health and thus, has a common ground with food policy. The knowledge-policy-change model can be a useful tool for this research to understand how knowledge created by food-related collaborative platforms can impact the knowledge pool that is potentially used by governmental institutions. The model also describes how this knowledge can lead to different levels of policy change (Bryant 2002).

Figure 2.14 Knowledge-food-policy-change model



Source: Author's own figure after Bryant 2002

The policy change model is based on a linear structure and it is outlined in seven steps. The first step (1.) defines the starting point where knowledge is created and transferred by civil society. Civil society refers to a broad spectrum of politically engaged actors including industry, NGOs, or collaborative platforms. The second step (2.) includes professional and non-professional actors that have a role in certain policy change activities. Professional policy analysts can include university professors, health or

agriculture departments affiliated with governments, private policy organisations, or non-governmental agencies. The term 'citizen activity' describes actors involved in policy-change activities but outside of the expert policy community. "*Citizen activities tend to address issues that affect them personally and may be perceived by the public as self-interested*" (Bryant 2002, p.93).

The model assumes that the actors of step two are "*seen as processing an objectivity that allows the separation of self-interest from their knowledge creation activities*" (Bryant 2002, p.92). The third step of the model outlines different ways of how knowledge is processed or organised. This is also related to the concept of knowledge dimensions. Bryant describes this as "*different ways of knowing about a social issue*" (Bryant 2002, p.93). Similar to Nonaka's knowledge typology concept, Bryant also uses different typologies of knowledge to outline the different ways of knowing. Instrumental knowledge can be defined as ''scientific knowledge'' that involves often tangible and numeric content. Interactive or lay knowledge is based on lived experiences. The exchange of this knowledge within daily life can be critical, as it can be a reflective form of knowledge (Bryant 2002).

All three types of knowledge are isolated from each other, in a space "*where governments neither consult nor consider the views of community members*" (Bryant 2002, p.93). The fourth step (4.) focuses on different ways of using knowledge. This step considers how knowledge is presented and looks to the influence of legal frameworks, public relations, personal stories, and political strategies. The legal framework considers the use of legal and formal knowledge through which a case is presented to policy makers.

The way of using knowledge through the public relations approach implies the marketing of a political message to an audience. The personal stories approach describes a narrative form where individuals present their interactive knowledge to policy makers by outlining how past policies affected their personal circumstances. The political strategic process is based on the political system itself through which policy

objectivities are presented. "*This approach involves knowing the political system, specifically the politicians and civil servants to meet with to present their policy perspective to, and strategizing to achieve their policy objectives*" (Bryant 2002, p.93). Step five (5.) describes the state and its institutions as actors that make policy decisions, based on the states ideological beliefs of the state where ideological beliefs function as filters through which knowledge is produced and comprehended (Bryant 2002).

Bryant suggests the three forms; normal, gradual paradigmatic and paradigmatic policy change, can occur through knowledge impact (step seven). Normal policy change implies no policy changes to the overall objectives, as it is more of a routine policy change with no radical changes. Paradigmatic gradual policy change implies multiple normal policy changes that may lead to a policy paradigm shift. Paradigmatic policy change is the strongest and most radical form of policy change, which may include for instance implementing a ban on unhealthy food products or introducing a sugar tax (Bryant 2002).

2.4 Summary

Chapter two set out the academic literature on collaborative platforms, collaborative learning and knowledge sharing and the role of knowledge within policy. The function of this chapter is to outline the intellectual problem of this research and seeks to address and the academic relevance of the research.

Within policy arenas, such as environment (Rio +20), health (The Global Fund), or corruption (Transparency International), one can see the rise of collaborative structures between private and governmental actors, moving away from state-centric approaches. This indicates that over the past twenty years there has been an active shift from government and state-centric oriented policy towards governance structures. Society-centred academics argue that contemporary and future problems such as food sustainability are highly complex and they conclude that the traditional state is overwhelmed and unable to find solutions on its own. Contrary, modern governance theories state that the government

consciously shares power with non-governmental actors and that governments are seeking to govern through a more modern approach.

This thinking is central to this research as it helps to understand the role of food industry led collaborations within government arrangements and explore further the relationships between state and collaborative platforms. Most food related collaborative platforms label themselves as partnerships, alliances, collaborations, coalitions, or roundtables. Most collaborations are formed as stakeholders share a common goal that they are more likely to achieve through the sharing of goods and knowledge. While scholars point out the benefits in collaborating, such as spreading costs and resource scaling, there are also risks such as differences in stakeholder's ideology and methods. Statistics reflect that the majority of collaborations tend to fail and are often seen by stakeholders as expensive. The literature points out various rationale why stakeholders collaborate and what types of collaborations can accrue. Stakeholders might see themselves forced to collaborate as a consequence of legislative circumstances, such as laws on CO2 emissions, or actors decide to collaborate because of other industry pressures. Collaborative structures can also differ based on the level of formality, the strength of partnerships and type of collaborative interaction. A great significance within collaborative platforms is the level of competitiveness between members as this can impact the effectives and harmony within the collective. For this research it is particularly important to distinguish competitive and non-competitive collaborations as a non-competitive collaboration is likely to be more beneficial for knowledge exchange and collaborative learning. The exploration of real world examples regarding food related collaborative platforms, as this is done in the later stages of this thesis can help to sharpen some of those larger academic debates.

This chapter has also explored the academic literature on collaborative learning and knowledge sharing as this research has explored two collaborative platforms and their role as knowledge hubs within food sustainability. Knowledge is a central element of this research and the exploration of the literature reflects a variety of understandings of how knowledge is perceived. Knowledge can be regarded as something tangible and countable such as numeric statistics on water needed for the production of beef meat, knowledge can also be something very abstract such as a feeling or cultural custom. Knowledge can also be used as a powerful tool in shaping public opinions and promoting certain ideologies in line

with Foucault concept of 'Knowledge is power'. This syntax is important for this research as this thesis has explored the types of knowledge and the ideologies that go with them of food related collaborative platforms in food sustainability.

Not only knowledge itself plays an important role for this research but also the processes and mechanisms that lead to that knowledge. Since this research has explored two collaborative platforms, literature on collaborative learning was outlined in this chapter. The complexity of collaborative learning accrues through the fact that multiple individuals are involved in the learning process as compared to one. Even though the literature recognises that collaborative learning starts from individual learning, collaborative processes and mechanisms can have a magnifying effect on the creating and transfer of knowledge. Six different concepts of collaborative learning were presented in this chapter that are predominantly recognised by the academic literature as 'hands on' and realistic. The reason for this is that all of these collaborative learning concepts have been explored through real world case studies.

Nonaka's knowledge spiral has explored the learning and exchange of knowledge within car manufacturing companies in relation to their complex production and delivery processes. Here collaborative learning accrues through stages where an individual spark an idea to a larger group which leads to a magnified collaborative learning process that is embraced by the larger collective. Collaborative learning can also be explained through connected interactions of individuals that process knowledge through their individual perceptions and preferences. These stem from an individual's or groups social capital that is determined through elements such as cultural origin, education, wealth or language. This concept states that the compatibility of social capital amongst members of a group determines collaborative learning. A more in-depth process of collaborative learning can also be explained through an 'Authentic Dialogue' between members of a collaboration. This dialogue can be described as day-long dialogues between members that come to solutions and agreement. Vague ideas are shaped to specific plans and concepts through constant reciprocal considerations of options. This process of collaborative learning benefits from mutual trust and transparency within a collective. For this research the aspect of trust and transparency is very interesting as two food industry led collaborations were explored and industry actors usually tend to be in a competitive mindset.

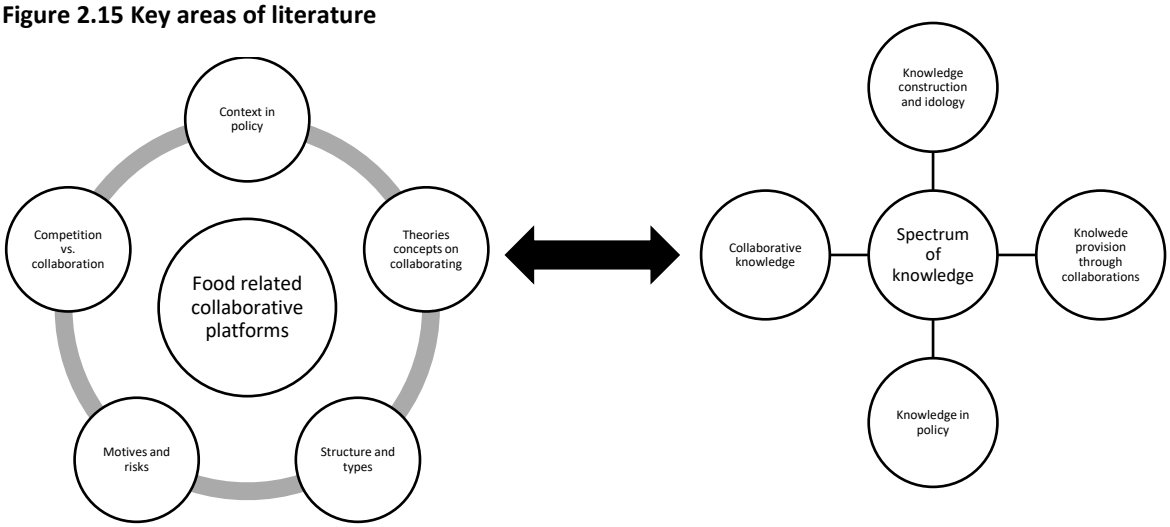
Since this thesis has focused on collaborative knowledge that relates to food sustainability, elements such as transparency and creativity appear to be critical according to a number of scholars. This chapter has outlined the benefits of creativity in order to develop a thinking and knowledge that is beneficial for sustainability. Learning through traditional methods, such as attending a lecture are likely to produce knowledge that is in line with the current thinking. In comparison scholars such as Lozano point out that with the use of creativity members of a collaboration are more likely to overcome 'out-dated' thinking and hence produce alternative forms of knowledge which can trigger a rethinking and change towards more sustainable concepts. This thesis later outlined how this element of creativity is existent within the two collaborations and how this impacts the creation of knowledge on sustainability.

After the exploration of what knowledge is and how collaborative learning can accrue in relation to sustainability, the third part of this chapter has looked at literature on the use and role of knowledge in policy. First, it is important to understand the relationship in policy between those that provide knowledge and those who seek knowledge. Stakeholders that provide knowledge to policy makers have always a specific intention or aim, such as influencing the decision on a regulation. Even the desire for a knowledge provider to be 'neutral' is a position itself linked with an expectation of a desired outcome. On the other side those in policy that seek knowledge are very specific about the types of knowledge and the way certain content is presented. This is not a question about what is right or wrong, but rather what forms of knowledge are in line with a political campaign or policy development. An example for this could be that policy makers that are pro environmental are likely to seek knowledge that supports their arguments on the need to implement more protection against pollution. Since this research has explored industry led collaborations, it is important to recognise their specific role as knowledge providers and also understand the motives of those that seek knowledge from those collaborations. This relationship is outlined at later pages of this thesis and connects existing literature with the outcome of this research.

This chapter has explored essential literature on collaborations, collaborative learning and the role of knowledge in policy. It became evident that this research is intellectually and academically highly relevant in contributing to this body of literature and extend the

understanding on collaborative knowledge. In particular this research has focused on narrowing down those concepts in the area and discipline of food policy since this has been lacking in existing literature. This research looks to fill the gab within food sustainability by looking at the connection and interdependence of areas set out in the literature review (as depicted in Figure 2.15.).

Figure 2.15 Key areas of literature



Source: Author

The intellectual problem this research seeks to address considers the link between knowledge utilisation in food policy and collaborative knowledge creation and sharing platforms. At the time of writing, this link has yet to be explored in detail. This research suggests there is a strong interdependence between the formation of food-related collaborations, the motives of actors in joining collaborations, structure and mechanisms of collaborative learning and knowledge sharing, as well as an impact of that knowledge within food sustainability.

This Chapter functions also as a link to the following Chapter three which elaborates on how the research of this thesis has been conducted. This research has put the research outcomes into context of existing literature. This allows this thesis to put the research results into a wider context and expand the academic literature on food policy. This research was conducted in line with high academic standards and the process of how the research was conducted is outlined in the following Chapter three. This gives not

only context to the reader on the research process but gives also legitimacy to the research outcomes and to be in line with the standards of existing academic literature. Chapter three outlines the research questions, the methodological and analytical approach, as well as ethical considerations that were considered in this research.

3 Chapter Research design and methodology

3.1 Research questions

Chapter one has demonstrated that collaborations are happening within the food system and particularly within food sustainability. These food related collaborations range from local to multi-national platforms. Collaborative learning and the sharing of knowledge is often a key element for these collaborations. Chapter two has shown that the academic literature has previously elaborated on relevant areas, including motives for collaborative groups, collective learning, or the role of knowledge in complex policy arenas. Food related collaborations are being formed by industry, civil society and government stakeholders. Their work revolves around collaborative learning and knowledge sharing in relation to sustainability challenges. At the same time, there is no clear academic body of literature that addresses these developments in the food system. Instead, in Chapter two it was only possible to identify different academic disciplines that gave a partial and fragmented overview. There is a lack of academic research that specifically explains the role of food related collaborative platforms within food sustainability. In particular, there is no single body of academic literature that explains collaborative learning and knowledge sharing processes within such platforms, including the impact they can have through their knowledge on food sustainability. The aim of this research is to fill this gap in the academic field of food policy and provide academics, food industry, government and civil society actors with an opportunity to reflect intellectually and pragmatically on these developments within the food system and its sustainability. This is expected, as the research problem entails a diverse range of academic fields, such as policy, knowledge management or food studies.

The first aim of this chapter is to express the research problem through the research objectives and research questions. The second aim is to outline the research design and methodological approach that helped to answer the research questions. The objective of this research was to examine how food related collaborative platforms create

knowledge and how their knowledge impacts food sustainability. This research addresses the following four key research questions:

RQ1. Why are actors in the food system collaborating in multi-stakeholder platforms in the context of food sustainability?

RQ2. How do food industry led collaborations create and transfer knowledge in the context of food sustainability?

RQ3. What types of collaborative knowledge are valued by actors that participate in food sustainability?

RQ4. What impacts on food sustainability do food industry led collaborations have through their knowledge?

The academic value of this research is to apply a set of theoretical frameworks and models of organisational learning, knowledge in policy, knowledge management, collaborative multi-stakeholder activities and food sustainability. This allowed the testing and modification of the existing academic approaches, outlined in Chapter one and II to apply them in the academic field of food policy. The aim is to gain a better understanding of collaborative multi-stakeholder initiatives in the food system that can help actors from academia, industry, government and civil society to utilise and explore collaborative initiative in the food system more effectively.

The social value of this research is to understand alternative and modern approaches in complex and multi-actor policy fields. Topics such as food sustainability involve an immeasurable number of sub-policy fields that involve different actors across industry, civil society and government. The formation of collaborations in the food system appears to be a response to the rising complexity of food sustainability challenges. These are not only of environmental or economic nature but are also likely to impact people's lives. This can include a wide range of issues from the development of sustainable diets to fair working conditions for farmers.

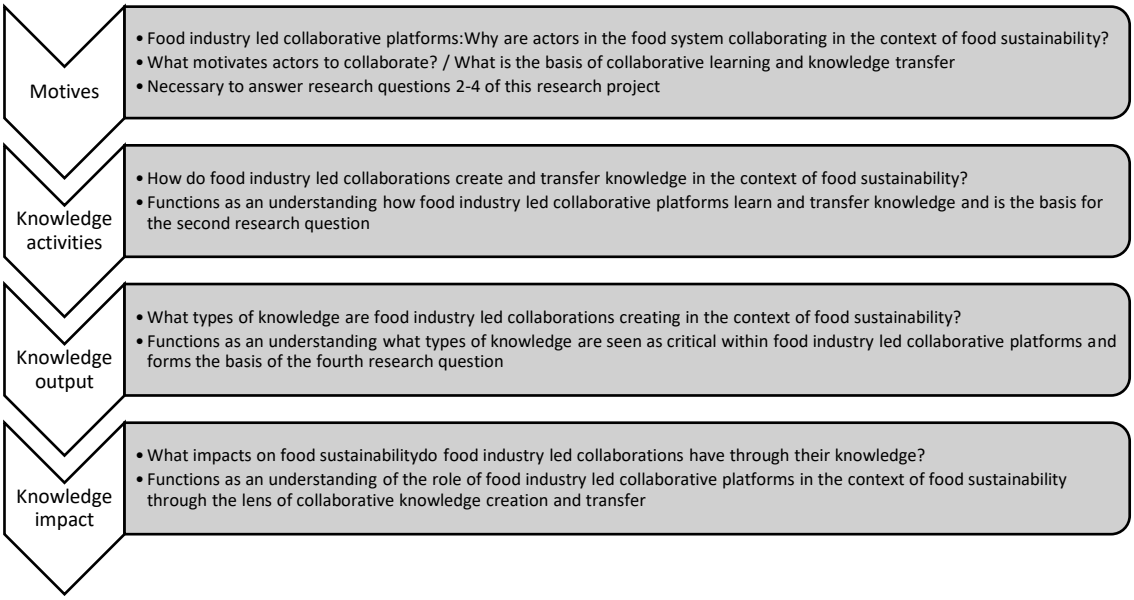
The four research questions of this research project are designed to build on each other and follow a logical and coherent structure. Research question one (RQ1) focuses on the

motives of diverse actors to participate in a food related collaborative platform. These motives can form the foundation of why a collaboration has chosen a certain approach of knowledge creation and sharing. Motives can also help to understand why certain types of knowledge have been created and shared within the collective and why other types have been left out. From a pragmatic perspective, the second research question (RQ2) focuses on collaborative knowledge creation and sharing procedures in food sustainability. RQ2 helps to reflect intellectually on theories and concepts of collaborative learning in Chapter two, and it explores to what extend these are relevant for collaborative platforms that work within food sustainability. RQ2 forms the basis for the third research question (RQ3) that relates to the types of collaborative knowledge created and shared by the collective. RQ3 also aims to understand to what extent existing literature reflects the types of knowledge valued, produced and shared within food related collaborative platforms and food sustainability. The fourth research question (RQ4) explores the actual effects food related collaborative platforms have on food sustainability through their collective knowledge. The findings on RQ4 are used to reflect on theories and concepts regarding knowledge utilisation in policy and the provision of knowledge by collaborative stakeholder groups in food sustainability. RQ4 reflects on the knowledge impact of that collaborative knowledge output.

Figure 3.1 illustrates a schematic overview of the structural approach behind the research questions, which will be used throughout this thesis. Based on this approach, the four research questions of this cover the following four areas:

I. Motives
II. Knowledge activities
III. Knowledge output
IV. Knowledge impact

Figure 3.1 Logical structure of the research questions



Source: Author

All four research questions help to answer the academic problem set out at the end of Chapter two. The chapters on research findings (Chapter four) and analysis/discussion (Chapter five) are organised in overarching sections that relate to each of the four research questions. The findings of the research questions can help to develop an academic research output that connects the four academic areas concerning the motives of actors to join and participate within collaborative platforms; concepts on collaborative knowledge creation and sharing; the types of knowledge created and shared collectively; and how that knowledge can impact complex policy s. This will help to contribute to the existing lack of academic research and establish a key field within the food policy discipline.

3.2 Research design

The following section elaborates on the research design that was used for this research. A research design is a fundamental element of a research that outlines an aimed master plan on the different stages of the conducted research. The research design can be regarded as an overarching plan before data collection or data analysis. A research

design is however more than just a plan as "*the function of a research design is to ensure that the evidence obtained enables us to answer the initial question as unambiguously as possible*" (De Vaus and de Vaus 2001, p.9). Yin describes the research design as "*a log plan for getting from here to there, where here may be defined as the initial set of questions to be answered, and there is some set of conclusions [answers] about these questions*" (Yin 2013, p.28).

In social research, the basis of a research design can be descriptive or explanatory. This thesis is based on a research design that aims to do both. Descriptive research tries to answer, 'what is going on' and ideally provokes the 'why' questions of the explanatory research. The approach in social sciences that helps to explore the explanatory research is theory testing and theory construction (De Vaus and de Vaus 2001). The research design that was used for this research is the case-study design based on Yin. Section 3.3 outlines in details the case study method that was used for this research. According to Yin a case-study research design has the following five important components (Yin 2013):

1. Case study questions;
2. Its propositions, if any;
3. Its unit(s) of analysis;
4. The logic linking the data to the propositions; and
5. The criteria for interpreting the findings

The first component is the research question which helps to identify the appropriate research method. According to Yin a 'how' or 'why' question is often a hint to a case study research design. The research questions are often identified and narrowed down by a literature review that explores the academic and real-world situation. This exploration of the literature review is reflected in this thesis in Chapter one and two. They have the function of identifying appropriate research questions in the field of knowledge creations and sharing of collaborative platforms in the context of food sustainability. Since this is a multidisciplinary research-field, the first two chapters

explored relevant theoretical and empirical literature in the fields of collaboration, organisational learning, collaborative knowledge in policy and food sustainability.

Chapter three outlines the research design and methodological, conceptual and analytical approach, including the four research questions of this research. A key component is to identify the case studies that need to be examined (see Section 3.3). The identification of these units includes the two steps of defining the case studies and their bounding. To ensure a robust selection of the best suitable cases, different collaborative groups were critically reflected against the selection criteria. The four research questions ensure a clear proposition by focusing on the two-case studies, Product Sustainability Forum and SCP Roundtable, and their activities regarding collaborative learning, knowledge sharing and their impact on food sustainability through knowledge. The two selected case studies are outlined in more detail in Section 3.3.

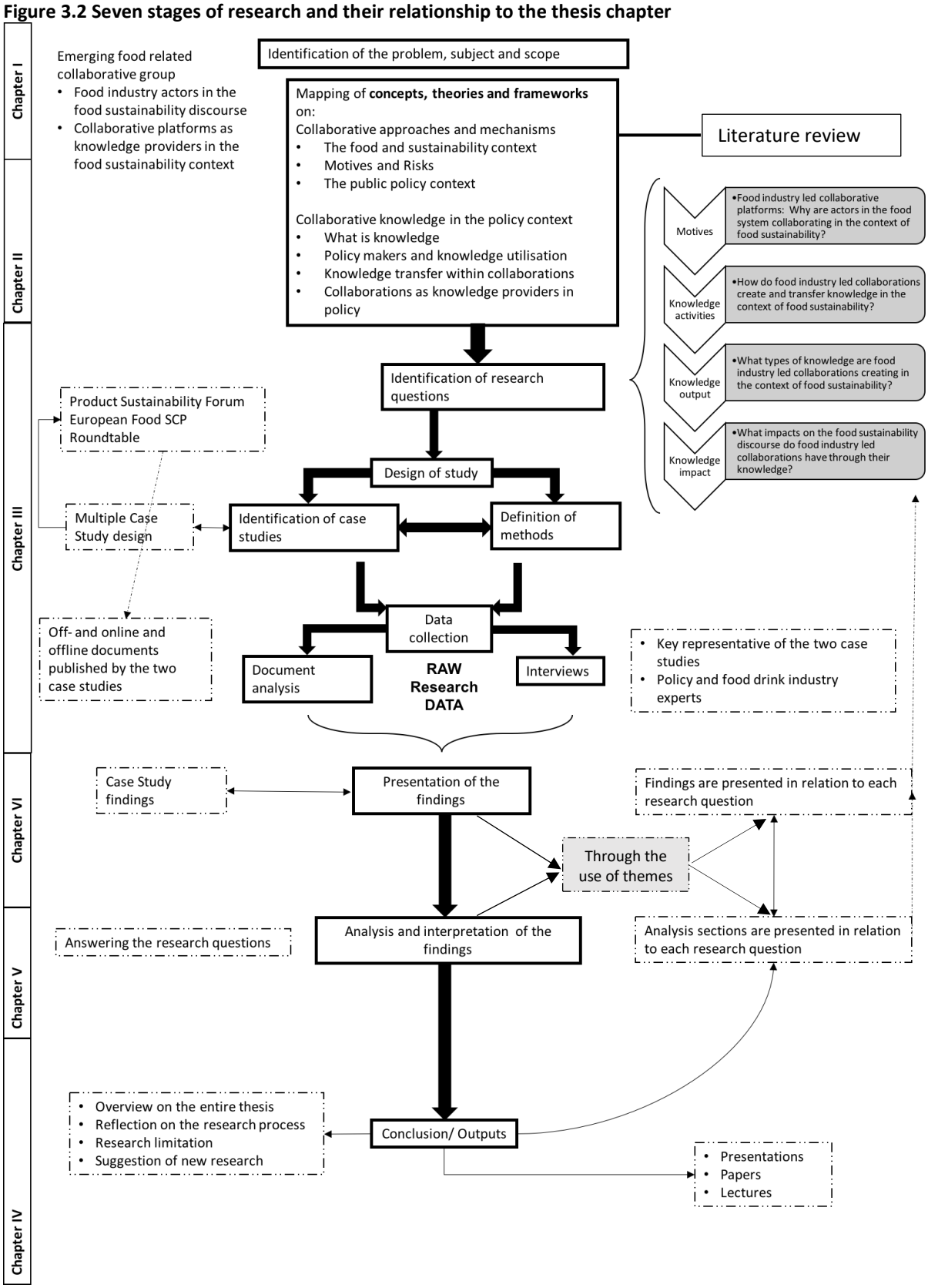
Chapter four outlines the collected research data in relation to each research question and links the data to propositions. The key aspect here is to combine the case study data that was collected and reflect them through the targeted propositions. To ensure a structured approach in the research data presentation, the researcher has selected 16 themes through which the findings are organised and laid out. These themes were selected by the researcher based on the reflections from the literature review, conducted interviews and analysis of the documents. Chapter four ensures that the raw data presents the findings systematically by the initial research questions. Chapter four is structured into four main parts that relate to each of the four research questions. Chapter five follows the analysis of the research data which is outlined in Chapter four. The aim is to have clear criteria and a systematic approach for interpreting the findings later in the analysis and discussion chapter.

An important element for analysing the findings was the use of computer-assisted tools which helped to code and categorise large amounts of data, including textual data. The findings are in a textual format (transcript), which have been collected from semi-

structured interviews (see Section 3.7.1). The transcripts were analysed and categorised through the textual analysis software NVivo. A coding scheme was developed and applied in NVivo, which helped to organise and categorise the content in a systematic and structured manner. To keep a coherent structure in the thesis, Chapter four is organised in the same 16 themes that relate to each of the four research questions. Both, Chapter four and five contain an overarching section that relate to each of the four research questions.

Chapter six is the concluding chapter that summarises the research findings, points out limitations of the research, provides recommendations to stakeholders and gives suggestions for further academic research. The following schematic structure illustrates the architecture of the thesis in six chapters (see Figure 3.2).

Figure 3.2 Seven stages of research and their relationship to the thesis chapter



Source: Author

3.3 Multiple-Case study research design

The following section elaborates on the multi-case study research design that was used for this research project. For this research, it was important to use a methodology that allowed a focus on contemporary events as well as the best way in which to answer the research questions. A qualitative method enables the researcher to explore human behaviour, thoughts and feelings. This research investigates how actors within collaborative structures learn by examining their values and perceptions on food sustainability change. It is therefore a suitable approach to answer the research questions by using a qualitative research approach. This allows the researcher to explore complexities within a group or organisation and makes it possible to investigate the informal reality which can only be accessed from the inside. Compared to that, quantitative research methods would not be suitable to answer the research questions, since they mainly focus on counting and measuring by using numbers and statistics. According to Gillham, "*qualitative methods focus primarily on the kind of evidence (what people tell you, what they do) that will enable you to understand the meaning of what is going on*" (Gillham 2000, p.11). Qualitative research aims to understand real-world problems in a way where the researcher tries not to influence the research subject. Qualitative research distinguishes itself from quantitative research, as the research outcome is not based on statistical, numeric or quantifiable data. Instead, qualitative research relies on findings that are drawn from the real-world phenomena that are researched through methods such as interviews, observations or ethnographies (Strauss and Corbin 1990; Patton 2002; Golafshani 2003). This section outlines the rationale of using a multiple-case study research approach in this research. It involves a brief outline of a case study research, including the advantages and disadvantages compared to other potential feasible methods. A case study research method tries:

> "*to answer specific research questions (that may be fairly loose to begin with) and which seeks a range of different kinds of evidence, evidence which his there in the case setting, and which has to be abstracted and collated to get the best possible answers to the research questions*" (Gillham 2000, p.1ff.).

A case study research approach has an advantage in answering real-world 'how' and 'why' questions that aim to be more explanatory. An experimental approach in understanding collaborative knowledge sharing and learning could have been considered but was excluded since it is not an optimal method to investigate a real-world scenario.

Despite the advantages of using the qualitative case study method, there are some potential criticisms that need to be considered. A major problem with the case study method is if the researcher allows equivocal evidence or is biased. The danger is that this might influence the direction and outcome of the findings. The lack of a systematic approach is often seen as a potential problem as well. The case study method has only a limited number of tests that outline a clear methodological structure. This often leads to a situation where researchers develop their own systematic approaches, which can be criticised as sloppy or inaccurate. According to Yin, an additional criticism relates to the lack of scientific generalisation. Scientific evidence is often validated by multiple experiments and sometimes methods do not follow a similar approach. Nevertheless, Yin mentions that "*the same approach can be used with multiple-case studies but requires a different concept of the appropriate research designs*" (Yin 2013, p.19).

More specifically, the case study method allows for an analytical generalisation of theoretical positions as it does not represent a statistically representative sample (Yin 2013). The case study method has also been criticised for having an unmanageable level of effort. This refers to the preconception that case studies take a long time and result in an unmanageable and unstructured amount of data. Yin, however, points out that this criticism results from the confusion between ethnographic and case study approaches. An ethnographic approach can often take long periods of time since the researcher is trying to follow a narrative and investigates behavioural aspects. A case study approach, however, does not necessarily need long time as it does not only rely on ethnographic or participant observation data (Yin 2013).By the first decade of the 21st century, randomised controlled trails (RCTs) had become the 'gold standard' for methods. This has led to the position that case study research and other non-

experimental methods are regarded as less scientific. Contrary to this position, supporters of qualitative methods have pointed out that it is possible to tease out details. Others argue that quantitative research and RCTs can fail to provide the 'why' and 'how'.

The following requirements for a robust case study design have been drawn and identified from methodological literature. In order to ensure a robust research design of high quality, Yin suggests to try the research design against four logic tests (Yin 2013). These tests focus on:

1. Construct validity
2. Internal validity
3. External validity
4. Reliability

The construct validity ensures that the researcher has identified correct operationalised measures for the undertaken research. This thesis aims to understand how knowledge creation and learning amongst members of collaborative platforms function, including the impact of that knowledge on food sustainability. Previous research on collaborative knowledge management has shown that the exploration of personal experiences of individuals is effective for understanding such knowledge mechanisms. Even though collaborative learning and knowledge transfer occurs in a group, the actual experience is on a personal and individual level, as pointed out in Chapter two. This research has therefore used personal experiences of individuals as a measure.

Yin's second test is the internal validity, which focuses on the logic behind inferences and causal relationships within the case study design. Because the research data was sourced from interviews and document analysis, there is no usable data from direct observation that confirms inferences. As mentioned in Section 3.3, even though it was possible to conduct observations, research ethics restrictions made it impossible to use this data in the research. To ensure a logical and coherent inferences for this research, the method of 'explanation build' was used in the discussion and analysis chapters (Chapter four and five). This includes a narrative form that helped to explain how the

causal links between collaborative activities collaborative learning and knowledge transfer; or relationships between collaborative knowledge and implications for food sustainability. Narratives might not be precise and can make the analysis of the case study data less convincing. The research therefore reflects the explanations of theoretical propositions that were outlined in Chapters I and II.

The third test is external validity, which relates to the generalisation of the case study research findings. This element has been mentioned earlier by reflecting the disadvantages of a case study method. The case study method in this research did not seek a statistically based generalisation, but rather aimed to allow for an analytical generalisation of the theoretical propositions that have been outlined in Chapters I and II.

The fourth case study design test according to Yin is reliability, which aims to minimize the errors and biases in a study. This is relevant if other investigators are trying to repeat the same or similar case study. To ensure a high level of reliability in this research, notes were taken by the researcher throughout the research to identify aspects that occurred during the study. The use of such documentation is also recommended by Yin and it helped operationalise the detailed steps of the research process, which are outlined in section on data collection (see Section 3.7).

There is an ongoing academic debate on the rationale behind validity and reliability, since these are predominantly rooted in positivist and quantitative studies (Golafshani 2003). Scholars such as Stenbacka argue that it makes no sense to apply a 'test' for validity or reliability in a qualitative study. She suggests that alternative ways are needed that help to test the quality of qualitative research (Stenbacka 2001).

Contrary to this position, Patton and other scholars emphasise that there is a need to include reliability and validity during the stages research design and data analysis (Seale 1999; Patton 2002; Lincoln and Guba 1985). Even if reliability and validity is rooted in

quantitative research, this research project agrees with Patton's perspective and aims to ensure that the research data is reliable and valid.

3.4 Sampling

The following section outlines the sampling process behind the selected case studies. Finding the right 'cases' for case study research is a vital component. The criteria for the selection of suitable case studies were developed by considering the literature review on collaborative platform in Chapter one and two. These key criteria define what a collaborative platform needs to have to be considered as suitable for the research project. The criteria for the case studies in this research project are the following seven (see Table 3.1):

Table 3.1 Criteria for case study choice

#	Criteria
Criteria 1	Collaboration clearly defines itself as a collaborative platform with a focus on food sustainability (also see definition of a collaborative platform in Chapter one) and operates on a non- or pre-competitive basis.
Criteria 2	Collaboration is a multi-stakeholder platform representing and or focusing on the value chain of food and drink products.
Criteria 3	Collaboration holds regular physical meeting with consistent members, mostly from the same group of individuals.
Criteria 4	Collaboration states to have a clear focus on sharing and creating knowledge on food and sustainability
Criteria 5	Collaboration has a government actor involved, thus aiming to inform and or influence food policy on a governmental level.
Criteria 6	Collaboration has been active for several years and is still active.
Criteria 7	Collaboration produces publicly available material on work and progress.

Source: Author

All seven criteria relate to the research question propositions and are academically relevant as shown through the literature review. As shown in Chapter one, there is a broad spectrum of platforms that work on food sustainability and qualified as potential

case studies for this research (see Table 3.2). These potential case studies were identified through the use of online search engines that helped to explore groups, organisations, networks, forums or similar groupings that work systematically on food sustainability. Key words, such as 'collaboration', 'food sustainability', 'network', 'forum', 'organisation', 'knowledge' or 'learning' were used to identify relevant groups that could be used as case studies. Search for case studies on the internet allowed the researcher to efficiently inspect a number of potential candidates and quickly identify their focus, structure, membership, goals, history and other relevant information. The researcher was able to skim through webpages and documents of the potential case studies and quickly identify their relevance for this research. Additionally, it was possible through the use of the internet to identify contact details of individuals within these groupings. The amount of potential case studies that resulted from this process made it necessary to narrow the number of candidates down through the criteria in Table 3.1. to ensure that case studies reflected the core elements from the literature, namely collaboration, food sustainability, knowledge and policy.

Table 3.2 Potential Case Studies

Platform	Remit	Format
Food Industry Business Roundtable	Promotes the interests of the food processing industry in Southern California.	A non-profit business association with a particular focus on challenges for the food industry in Southern California.
The World Cocoa Foundation	Fosters public-private actions to accelerate sustainability within the cocoa sector.	More than 100 members ranging from farmers, financial institutions, cocoa processors, chocolate makers, manufacturers, farmer cooperatives, cocoa trading companies, ports, warehousing companies, and retailers.
Sustainable Agriculture Initiative Platform	Develops tools and guidance to support global and local sustainable sourcing and agriculture practices.	Over 90 members that are mainly from the food industry.
ISEAL Alliance	Provides and explores sustainability standards and provides tools training and events for standard setting.	International organisations and sustainability standards and accreditation bodies.
Sustainable Food Lab	Aims to improve sustainable agriculture from a leadership perspective.	A pre-competitive industry led multi-stakeholder collaboration that also supports the communication with NGOs and public agencies that work with food businesses.

Roundtable on Sustainable Palm Oil	Works with governments to establish more sustainability within the use and production of palm oil.	A multi-stakeholder platform with currently 3659 members from 92 countries ranging from food industry, farmers, consumers and NGOs.
Clinton Global Initiative	Creates and implements solutions to global challenges; including food sustainability challenges.	More than 200 current and former heads of state, Nobel laureates, and leading corporate CEOs, Presidents of foundations, Executive Directors of NGOs and major philanthropists.
INTERNATIONAL COCOA INITIATIVE	Supports sustainable development in the cocoa sector.	Broad spectrum of actors from agriculture, food industry, civil society, academia and government.
European Food SCP Roundtable	Supports EU policy objectives, notably those outlined in the European Commission's Action Plan on Sustainable Consumption and Production and Sustainable Industrial Policy.	An industry led multi-stakeholder platform with leading and powerful food industry stakeholders.
The Product Sustainability Forum	Advises UK and EU governments through their work on measuring, improving and communicating the environmental performance of the grocery products.	A multi-stakeholder platform with a food industry focus and members from civil society and NGOs.
Food & Business Knowledge Platform	Aims to bring actors across the food value chain together to exchange knowledge on Food and Nutrition Security. The knowledge is aimed to help develop an inclusive and ecologically sustainable food systems.	Members are mainly organisations that represent business, science, civil society and policy stakeholders across the food value chain.
Horizon 2020 Advisory Group for Food Security, Sustainable Agriculture, Marine and Maritime Research and the Bioeconomy	Provides advice to the EC on 'Food Security, Sustainable Agriculture, Marine and Maritime Research, and the Bio-economy'. The advice is a contribution to the Europe 2020 Strategy, the innovation Union, and to other relevant EU policies.	A multi-stakeholder platform initiated by the European Commission that consists of individual experts, NGOs and academic institutes across the European Union.

Source: Author

At the same time, the selected case studies had to conform with the definition of what is regarded as a collaborative platform in this research. In this thesis, collaborative platforms are defined as:

Two or more independent stakeholders from government, civil society and/or industry (located in different or in the same position(s) of the food value chain) that make an agreement in which the members voluntarily collaborate on a non-competitive basis

without formal relationship, but through mechanisms that provide reciprocal advantages to achieve goals that members have in common. The partners contribute to the collaboration by providing tangible resources such as money and intangible resources such as knowledge on the basis of a shared vision about the future (Gray 1985; Gray 1989; Pellicelli 2003; Inkpen and Tsang 2005).

The selection of the appropriate case studies was also based on 'pragmatic' criteria, such as access to the collaborative platform and its members, including the ability to conduct preferably face to face interviews. Through gatekeepers within the Centre for Food Policy at City, University of London, it was possible to shortlist a number of collaborative platforms. Within this list in Table 3.2, the collaborative platforms selected were located within the European continent, as the researcher is based in London (UK). This geographical proximity to the researcher's location would benefit the data collection, especially the method of conducting the interviews with members of the collaborative platform. Some collaborations were either based within other continents such as North and South America or held flexible meetings across the globe. This geographic distance and uncertainty regarding the location of the collaboration was regarded as a potential barrier for the researcher to a conduct thorough field work. As the researcher feels most comfortable in conducting researching in English or German, some collaborations were excluded as in some cases the main communication language for members appear to be also Spanish, Portuguese or French.

After having applied these 'pragmatic' filters, the remaining collaborative platforms were reviewed under the seven case study criteria in Table 3.1. This systematic review of the potential case studies led to the choice of the two collaborations SCP Roundtable and the Product Sustainability Forum. Both organisations are voluntary multi-actor collaborative platforms and focus on knowledge sharing and creation in the context of food sustainability. Their aim is to inform a broad spectrum of stakeholders within food sustainability, including policy makers. Both case studies are food industry led collaborations with governmental and civil society members. The case studies also meet physically on a regular basis and have a relatively constant group of individuals that form the membership.

In summary, the Product Sustainability Forum and The SCP Roundtable met all 'pragmatic' and key case study criteria set out by the researcher. Thus, both case studies were appropriate to deliver research findings that answer the research questions and fulfil the research objectives. The detailed characteristics, structure, membership and goals of both collaborative platforms are outlined in the following Section 3.3.

3.5 The case studies

This section is a descriptive outline of the two investigated collaborative platforms, European Food Sustainable Consumption and Production Roundtable and Product Sustainability Forum. Both collaborations are voluntary multi-actor collaborative platforms that work in the field of food sustainability. The sustainability aspect is a key element for both platforms, but at the same time they do not clearly define what they mean by sustainability. The focus of both collaborative platforms is on knowledge creation and sharing with the aim to implement and investigate sustainable practices in the food system and especially the food industry. This presentation of the two case studies gives a context and background. This includes their history, members, structure, objectives, priorities, internal working processes and elements that relate to collective learning and knowledge sharing in the context of food sustainability. The aim of this case study description is to outline how the PSF and the SCP Roundtable perceive themselves and present themselves externally. This content can help to understand how the structure and characteristics of the two collaborative platforms reflect on collective learning and knowledge sharing in the context of food sustainability. A good outline of the two collaborative platforms can also be beneficial for giving context to the research findings and analysis in relation to the four research questions and the overall research objective. The research data that has been used for the description of the two case studies PSF and SCP Roundtable is predominantly based on documents that have been published by the two collaborations.

3.5.1 The SCP Roundtable

The European Food Sustainable Consumption and Production Roundtable (SCP Roundtable) is a voluntary collaborative platform that was formed in 2009 in Brussels and co-chaired by the European Commission (EC).

Figure 3.3 Logo of the SCP Roundtable



Source: The European Food SCP Roundtable 2013, p.1

The SCP Roundtable consists of 12 European food chain organisations and the Sustainability Consortium as an associate member (see Table 3.3). The European Environment Agency (EEA) and the United Nations Environment Programme (UNEP) are supporting organisations. In addition, the collaboration is engaged with 19 national and international actors from government and civil society that act as observers.

Table 3.3 Members of the SCP Roundtable

Name	Function
COPA-COGECA	COPA-COGECA is the umbrella organisation of the European agricultural industry. COPA stands for the Committee of Professional Agricultural Organisations and COGECA stand for General Committee for Agricultural Cooperation in the European Union including fisheries.
EUROPEN	The European Organization for Packaging and the Environment consists of industry actors in the field of packaging and logistics.
FEFAC	European Feed Manufacturers Federation is an umbrella organisation of European feed industry actors.
Fertilizers Europe	European Fertilizer Manufacturers Association is an umbrella organisation of European fertilizer industry actors.

FoodDrinkEurope	Umbrella organisation of the European food and drink industry
ACE - The Alliance for Beverage Cartons and the Environment	The Alliance for Beverage Cartons and the Environment is an umbrella organisation of beverage packaging industry actors.
ECPA	The European Crop Protection Association represents the European crop industry.
EXPRA	Extended Producer Responsibility Alliance is an umbrella organisation for packaging and packaging waste recovery and recycling systems industry
FEVE - The European Glass Container Association	The European Glass Container Association is a Federation of European manufacturers of glass containers and machine-made glass tableware.
FPE - Flexible Packaging Europe	Flexible Packaging Europe represents the flexible packing industry in Europe.
PFP	European Primary Food Processors Industry Association represents the primary food processing industry in Europe.
The Sustainability Consortium	The Sustainability Consortium is a global non-profit organization focusing on the transformation of the consumer goods industry.

Source: Author

The key members of the SCP Roundtable are predominantly umbrella organisations that represent industry actors across the agro-industrial food chain. For example, these umbrella organisations have a membership of economically powerful and globally leading food and drink manufacturers. To illustrate this, Food Drink Europe can be used as an example of the majority of SCP Roundtable members. A closer look at the Food Drink Europe's membership shows the involvement of economically strong food industry actors (see Table 3.4).

Table 3.4 Members of Food and Drink Europe

Food and Drink Europe	HEINZ	ROQUETTE	DUPONT	UNILEVER	TATE & LYLE	NESTLÉ	GENERAL MILLS
	DSM	KELLOGG	GB foods	FERRERO	SÜDZUCKER	DANONE	CARGILL
	Mondelez International	McCAIN	COCA-COLA	Kerry Group	ÜLKEK	National food industry	EU Food and Drink

						federations	associations

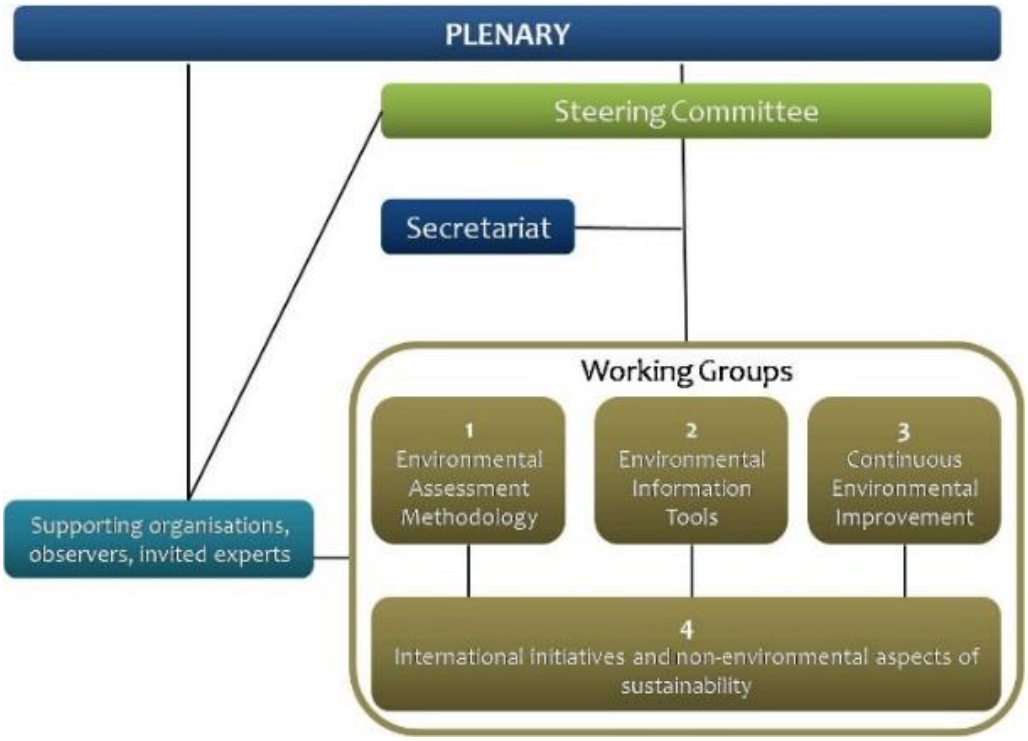
Source: Author's table

Beside these big food manufacturers, the SCP Roundtable has members that represent interest groups from large food commodities, such as sugar, vegetable oil or cacao. According to the SCP Roundtable, the vision is to promote a science-based collaborative approach to the food value chain. The collective's objective is sustainable production and consumption in the food and drink sector. The motivation behind the SCP Roundtable's work is based on the current unharmonised standards on sustainability. According to the collaboration, this confusion is caused by the high diversity within the food and drink system and the impact of that system on the environmental, economic and social aspects (The European Food SCP Roundtable 2015b). The work of the collaboration is organised into the following four working groups (WG):

- Environmental Assessment Methodology
- Environmental Information Tools
- Continuous Environmental Improvement
- International initiatives and non-environmental aspects of sustainability

All WGs are connected to the steering committee and each group gets external support from invited experts, supporting organisations and observers (see Figure 3.4). Even though all four WGs are independent, their work is complementary and connected.

Figure 3.4 Governance Structure of the SCP Roundtable



Source: (European Food SCP Roundtable 2015, p.9)

Each WG had regular physical group meetings, including annually updated mandates and actions. The focus of the collaboration is on the whole life-cycle of food and drink products with a clear focus on knowledge. This is evident through their lead principle:

> "*environmental information communicated along the food chain, including to consumers, shall be scientifically reliable and consistent, understandable and not misleading, so as to support informed choice*" (European Food Sustainable Consumption and Production Roundtable 2015, p.6).

The key objectives for the Roundtable are to:

- develop and promote further sustainability in the EU food chain
- improve the environmental performance of food and drink products throughout their life cycle
- develop specific solutions to assess and validate continuous environmental improvement across the food chain
- promote coordination and policy consistency on sustainability of food and drink products at international level

A key project of the SCP Roundtable is the development of the ENVIFOOD Protocol, which was developed between 2010 and 2014. The ENVIFOOD Protocol is a methodological framework to assess environmental factors of food and drink products. The framework mainly provides guidance on how to use and improve the Life Cycle Analysis methodologies and for environmental product declaration. Overall, there were 18 ENVIFOOD pilot tests on food and drink products, such as milk, coffee, cheese or meat. The basis for these pilots and the ENVIFOOD Protocol was the European Environmental Footprint Methodology (PEF). The PEF has been developed by the EC and is defined as:

> "*a multi-criteria measure of the environmental performance of a good or service throughout its life cycle. PEF information is produced for the overarching purpose of seeking to reduce the environmental impacts of goods and services taking into account supply chain activities (from extraction of raw materials, through production and use, to final waste management)*" (European Comission 2012, p.1).

Between 2010 and 2014 the working group on environmental assessment methodology (WG1) focused on the development of a:

> *"scientifically reliable, practical and harmonised environmental assessment methodology for food and drink products across Europe – including, as appropriate, product category specifications– to form the basis for voluntary communication of environmental information along the food chain, including consumers" (The European Food SCP Roundtable 2010a, p.3).*

The motivation behind the work of WG1 was the situation that a number of actors along the food value chain and in particular public authorities introduced different initiatives to help to inform consumers on the environmental performance of food and drink products. All these different food labels and product descriptions were based on different environmental aspects, methodologies, scope and scale. According to the SCP Roundtable this has led to unnecessary burden for actors along the food chain and can potentially mislead consumers and other stakeholders. The WG1 has therefore seen the need to produce over three years the so-called 'Harmonised Framework Methodology' (HFM). According to the SCP Roundtable, this methodology represents a common scientifically reliable framework that helps to assess the environmental performance of food and drink products. After developing and piloting the HFM, it was included into the ENVIFOOD Protocol (The European Food SCP Roundtable 2010a).

The working group on environmental information tools (WG2) focused on the development of communication tools that help to communicate information of the environmental performance of food and drink products between actors along the food value chain. WG2 has therefore outlined ten guided principles "*on the voluntary environmental assessment of food and drink products and the voluntary communication of environmental information along the food chain*" (The European Food SCP Roundtable 2010b). The motivation behind the development of communication tools was a high degree of heterogeneity, similar to that which motivated the work of WG1. The SCP Roundtable claimed that the diversity and high number of different communication tools initiated by multiple actors along the food value chain cause inefficiency and misleading information for stakeholders. The aim was therefore to research a harmonisation of the communication tools that were used to communicate environmental performance of food and drink products across all stakeholders of the food value chain. A key element for these tools is that:

> *"effective environmental information requires scientifically reliable and consistent environmental assessment methodologies to be applied along the food chain and the ability to effectively and efficiently communicate this information from one stage in the food chain to the next until it reaches the consumer" (The European Food SCP Roundtable 2010b, p.2).*

Working Group 3 focused on continuous environmental improvement and it's aims involve:

> "*identifying and prioritising major environmental challenges along the food chain, mapping existing and emerging voluntary industry and multi-stakeholder initiatives and standards, identifying priority areas for eco-innovation and disseminating best environmental practice*" (The European Food SCP Roundtable 2012).

Thus, WG3 functioned as an organisational body within the SCP Roundtable that connected individual initiatives of partners and brings them into a context of the collaboration's work. A report that was published in 2012 on the work of the WG3 outlines a number of initiatives on a wider spectrum of environmental sustainability and food. These included areas such as waste, energy, greenhouse gas emissions and water consumption (The European Food SCP Roundtable 2012).

Working Group 4 specialised in international initiatives and non-environmental aspects of sustainability. According to the SCP Roundtable, sustainability is regarded as a holistic concept. The platform claims to have to focus not only for environmental sustainability, but also on other food sustainability elements, such as economic and social factors. This holistic understanding of food sustainability is also based on a collaborative philosophy of shared responsibility to encounter negative impacts on stakeholders and society. WG4 was a complementing working group to the other three. WG4 analysed non-environmental food sustainability elements within each of the other three WGs. The outcome of the work of WG4 was a priority list of non-environmental sustainability recommendations to the SCP Roundtable and its WGs. The recommendations were based on the following six themes (see Table 3.5):

Table 3.5 Focus of the Working Group 4

Internal market and international trade	• Food miles • Carbon footprint and the use of national energy mix • National environmental assessment and communications schemes • Different national environmental policy requirements
Economic impacts on operators of environmental assessments, communication and improvement	<u>Main costs that need to be considered</u> • Human resources • Awareness raising and gaining consensus • In some cases, lower yields and/or higher raw material cost • Life-cycle assessment studies • Investment costs to adopt new technologies (water treatment, energy, etc.) • Inefficiencies caused by multiple standards • Certification costs (such as for auditing, training, transportation, maintenance of the standard)
	<u>Main benefits that can be achieved</u> • Economic savings through resource efficiency • Possibility to communicate on corporate responsibility • Increased sales (volume and/or price) as result of improved marketing opportunities • Attracting investments • Increase the credibility of operators or associations addressing societal challenges • Promote knowledge economy (Europe 2020 strategy) • Innovations • Incentivise companies to increase research and development activities • Motivation of employees, capacity to incentive staff and stimulate productivity • Better relations with suppliers and customers • Operational management; improved knowledge and understanding of the food chain leading to better operational management
Viability of SMEs	• Social sustainability • Food security • Consumer trust and choice • Health & nutrition • Animal welfare • Land grabbing

Source: Author's table based on The European Food SCP Roundtable 2010c

Even though the SCP Roundtable has a strong industry focus, the collaboration is also open to consumer organisations and environmental NGOs (European Food SCP Roundtable 2015). After 2015, the working groups completed their work and the SCP Roundtable now focuses on more routine work, such as:

- development and promotion of the ENVIFOOD Protocol
- promotion of the Roundtable's vision on food sustainability

- collaborative with further initiatives that help to assess the environmental performance of food products
- develop further sustainability measures and communication tools for B2B and B2C communication

(The European Food SCP Roundtable 2016)

3.5.2 The Product Sustainability Forum

The Product Sustainability Forum (PSF) is a UK-based collaboration that was formed in 2011 by the UK, Scottish, Welsh and Northern Irish governments. The collaboration involves different actors from the food value chain, including grocery retailers, suppliers, academics, NGOs and UK government representatives. The membership consists predominantly of large international food manufacturers, such as Unilever and Kraft Foods UK, and large retailers such as Tesco and Waitrose. Other food industry stakeholders are represented in the PSF through associations or federations. Stakeholders from the food industry form the biggest membership group within the PSF. Thus, even though the PSF was formed by government stakeholders, the collaboration can be regarded as a food industry led collaboration. In total the membership of the PSF adds up to more than 80 actors operating in various working groups. Table 3.6 lists the members of the PSF.

Table 3.6 Members of the Product Sustainability Forum

Akzo Nobel Boots UK ASDA	Business in the Community	Crown Paints Energy Savings
Stores B&Q	Carbon Trust Chilled Food	Trust Friends of the Earth
British Retail Consortium	Association Coca Cola	Food & Drink Federation Forum for the Future Green Alliance
British Soft Drinks Association	Enterprises Co-operative	Heineken UK HJ Heinz Co
Britvic Soft Drinks	Group Co-operative Farms	Henkel UK Home Retail Group
Institute of Environmental Management & Assessment	Bakkavör Group	Incpen
Wine & Spirit Trade Association WM Morrison Supermarkets WWF	John Lewis Partnership	IGD
Kimberly Clark - UK	Kraft Foods UK	Kellogg Company
Marks & Spencer	Molson Coors Brewing Company (UK)	Muller Dairy UK
Musgrave Group	Nestlé UK	P&G UK & Ireland
Premier Foods	Next Retail	Resource Futures
Sainsbury's Supermarkets	Sustainable Consumption Institute	Manchester University
Tesco Stores	Travis Perkins	Unilever UK
Waitrose	Warburtons	Waste Watch
Wickes	The PSF is also supported by DEFRA, the Scottish and Welsh Government	

Source: Author

Even though the PSF is an industry focused platform, it has also members from the NGO and civil society sector, such as the Sustainable Consumption Institute, Manchester University and Waste Watch.

The PSF is administratively steered and organised by The Waste and Resources Action Programme (WRAP) and can be regarded as a response organisation to the Courtauld Commitments. The Courtauld Commitment is a voluntary agreement aimed at improving resource efficiency waste reduction within the UK grocery sector (WRAP 2016c). The overarching aim of the Courtauld Commitment is to support the UK government in developing policies that help the goals of a ‘zero waste economy’ and climate change objectives. In total there have been three commitments reached between 2005 and 2015 that mainly focus on reducing primary packaging and food waste.

The PSF is a collaboration that helps to develop new goals and objectives to the existing Courtauld Commitments, which resulted resulting Courtauld 2025 and launched in

2016. Courtauld 2025 has a wider ten-year sustainability commitment for food and drink products. The new commitments of Courtauld 2025 and the work of the Product Sustainability Forum aims to:

- Provide lower impact products
- Provide them more efficiently
- Help people get more value from the food and drink they buy
- Make best use of remaining waste and surplus food
- Reduce 20% in food & drink waste arising in the UK
- Reduce 20% in the GHG intensity of food & drink consumed in the UK
- Reduce the impact associated with water use in the supply chain

The PSF has collectively worked on so called 'pathfinder projects', which help to develop the new commitments of Courtauld 2025. These pathfinder projects investigated areas of environmental impact within a product's supply chain. The PSF follows a 'farm to fork' approach that aims to capture the entire value chain of a food product through best practise sharing and problem solving. The type of food products that are investigated by the PSF can be considered as 'basic' every-day products, such as potatoes, milk chocolate, onions or apples. Retailers and food manufacturers play a significant role within the pathfinder projects as the food product value chains of specific retailers and manufacturers are highly regarded (see Table 3.7).

Table 3.7 Whole-chain resource efficiency projects

Project focus	Run by
Potato Value Chain	Co-operative Food and Farms (Retailer and Farmers)
Milk/Chocolate Value Chain	Nestlé and First Milk (Food and drink manufacture)
Fish value chain	Sainsbury's (Retailer)
Onion value chain	William Jackson (Food producer)
Apple value chain	Musgraves (Food producer)

Source: Author's own table after WRAP, 2017

These whole-chain resource efficiency projects reflect that the PSF is analysing food chains on a case study basis with the aim to draw parallels to similar food product chains in the food and drink sector. This is particularly approached through the development of a toolkit that aims to make other stakeholders in the food system apply a similar approach for their food and drink value chain analysis (Wrap 2014b).

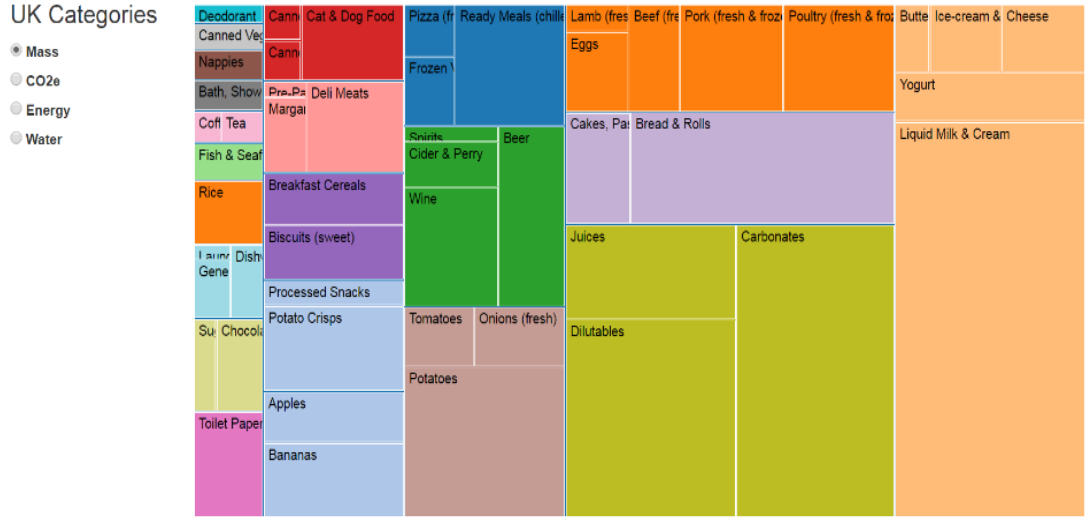
The PSF appears to have a strong focus on knowledge creation and sharing, as the outcomes of the PSF pathfinder projects are stored and accessible through the so-called 'Product Sustainability Forum Knowledge Base'. This Knowledge Base is a virtual "*collaborative space for those organisations interested in working together to quantify, communicate and reduce the life cycle environmental impact of grocery products*" (WRAP 2016a). The Knowledge Base has currently information on the top 50 food products researched in the latest work of the PSF. Content on the food products is presented through a visual and systematic approach in a Sector and Heat Map of five hotspots and four measures of footprint (see Figure 3.5 and Figure 3.6).

Figure 3.5 PSF Path Finder Project Sector Map

UK Footprint					Hotspots																					
					Materials and Agriculture					Packaging					Manufacture					Distribution					Consumer Use				
Product Name	Mass (000 tonne)	GHGs (000 tonne CO_2e)	Energy (000 GJ)	Water (000 million litre)	Waste	CO_2e	Energy	Water	Material	Waste	CO_2e	Energy	Water	Material	Waste	CO_2e	Energy	Water	Material	Waste	CO_2e	Energy	Water	Material	Waste	CO_2e	Energy	Water	Material

Source: WRAP 2016a

Figure 3.6 PSF Path Finder Project Heat Map



Source: WRAP 2016b

There is a clear emphasis on the collaborative character of the PSF both internally and externally. The PSF initiates other collaborative structures, such as The International Product Sustainability Network (INPSI). The INPSI is organised and administrated by the PSF in cooperation with the UNEP SETAC Life Cycle Initiative. The aims of the INPSI are similar to the PSF and focus on improving the sustainability of product value chains. Compared to the PSF, the activities of the INPSI are scaled up to a global level through international collaboration and shared actions. Knowledge creation and sharing is a vital element of the INPSI, which underlines the similarity to the PSF. According to WRAP, the goals are:

- Support the development, sharing and communication of product knowledge and wisdom, product life cycle data and sustainability information between members.
- Learn from practical piloting and implementation activities and identify opportunities for joint projects between members.
- Identify gaps in knowledge and find opportunities to fill them through collaboration and cooperation between members.

Source: (Wrap 2017)

According to the PSF, the core motivation is that food businesses are engaged in a competition over resources that are becoming increasingly constrained globally. At the same time, the basis of these resources is the eco-system which is impacted by climate change effects which put the global resource situation under more stress. Thus, the collaborative platform concluded that it is important to improve the resource efficiency and security of supply chains on a pragmatic and tangible level.

3.6 Exploration of potential research designs and methods

The following section sets out the research design that was used in this research, including alternative research designs that were considered. The literature review on organisational learning and knowledge showed that a research design is needed which allows research from both an organisational and an individual perspective. The research problem focuses on both, processes and implications regarding food related collaborative platforms as an organisational entity. This includes how the collaboration learns, acts and influences as a group. At the same time, collaborative platforms consist of individual members, each with their own perceptions and actions. These in turn shape the organisational processes of the collaboration.

The problem that the research project faced was that collaborative platforms, even if they work within the field of food, have different structural characteristics, goals and work methods. This circumstance led to the choice of a multiple-case study research design that focuses on specific food related collaborative platforms (see Section 3.3). This research design offers the flexibility to research multiple case studies at the same time and helps to draw wider conclusions about collaborative processes and the role of collaborative knowledge within food sustainability. It appeared important to not only focus on a single collaborative platform as that might lead to a narrow focus on a specific approach of collaborative knowledge creation, including a very specific knowledge pool and membership. Under consideration of the time and resources available to this research, it was regarded sensible to focus specifically on two food related collaborative

platforms. The benefit of focusing on more than one platform through the multiple-case study design will be the potential to compare the collected research data and drawn more robust conclusion. Section 3.3 outlines the sampling process that was applied to identify the two case studies, Product Sustainability Forum and SCP Roundtable, and Section 3.3 explores the two collaborations in more detail.

A research approach that delivers formal and quantitative data, such as surveys, did not seem to be an appropriate way to understand how individual members of a collaborative platform think, learn and what their perceptions on knowledge and food sustainability are. Such quantitative methods are likely to have less flexibility in exploring the individuality of members and can even fail to capture critical nuances of how individuals perceive individual and collaborative learning and knowledge exchange. It was clear by looking at previous research studies in the field of organisational knowledge that the method of interviews and observation would be an effective way of researching collaborative platforms. In the past these two methods have proven to be very suitable for exploring individual perceptions and relate these to organisational processes, such as collective learning (Gray 1989; Wood 1991; Innes and Booher 2010; Huxham and Vangen 2013). A qualitative approach would allow a more nuanced exploration of perception and cognitive processes of individuals, whereas a purely quantitative would have been less effective.

Even though the method of observation appeared to be suitable for the exploration of collaborative learning, it was not clear to what extend it would be possible to gain access to the research case studies. It was particularly unclear if it would be possible for the researcher to attend meetings or workshops of the case studies, which would be detrimental to the research as these would be important for observing learning and knowledge exchange. All internal activities of the selected collaborative platforms were not accessible to the public and at the start of this research it was uncertain whether the researcher would have access to internal activities of the selected collaborative platforms. Based on these uncertainties, the method of observation was excluded from the methodological approach. However, at a later stage of the research project it

became possible for the researcher to gain access to an annual internal meeting in one of the case studies where observations were made and data was collected. Although the researcher got permission by the participants to observe them for research purposes through verbal agreement, it was not possible to make use of the collected research data. The reason for this was that the method of observation was not included in the original research ethics and any use of this observational research data would be against the university's ethics regulations. At a later stage the researcher has tried to apply for the inclusion of the observation method through the research ethics committee. After requesting further information from the City, University of London Social Science Research Ethics Committee; adding a further method appeared to be administratively challenging and potentially problematic. Particularly granting ethical approval retrospectively for ethnographic data that was collected in the past appeared unreasonable and would create uncertainty for the data validation. In addition, even though the researcher was granted once permission to observe a meeting of the SCP Roundtable, it was not guaranteed that the researcher would have had access to further meetings of the SCP Roundtable and PSF. As a consequence of these outlined uncertainties, the observation method was excluded.

The method of a focus group was initially considered, as it would enable observations of a group of individuals within a controlled and pre-defined setup. This method, however, was excluded there was no guarantee to get access to a group of individuals from the case studies at the same time. Secondly, a focus group is in most cases an environment set up by the researcher and participating individuals would interact on hypothetical scenarios. This method would be less effective in exploring how individuals learn over longer periods of time and understanding how the role of collaborative learning and knowledge is in the context of real-world food sustainability challenges.

A further method that was considered by the researcher was the method of interviewing individuals. Interviews can help to get an insight into the perspectives of individuals and their perceptions regarding collaborative learning and knowledge sharing. Studies similar to this research have also used interviews as a preferred method for data

collection. The interview method is similar to other qualitative methods and is dependent on the access to members of the case studies. In comparison to other qualitative methods, interviews appeared to be more promising, as members of collaborations or other relevant participants could be approached individually through more targeted and flexible arrangements. Based on these characteristics, the method of standardised open-ended expert interviews was selected for the exploration of the research questions. This interview method is described in more detail in Section 3.7.1.

In order to make the data collection process more robust approach and to explore the research questions from a different perspective, document analysis was chosen as a supplement to the interview method. This included the examination of documents published by the collaborative platforms. Documents, such as reports or websites, can reflect the collective's work. The documents used were those produced by collaborations, as this also helps to understand how collaborative platform portray themselves and perceive food sustainability. In addition, only publicly available material was analysed. This aspect is critical as it helps to analyse how collaborations promote their knowledge to external stakeholders. The combination of the interview and document analysis method is beneficial for the research design. The interview method primarily explores learning and knowledge from an individual perspective, whereas the analysis of published material explores an organisational and group dimension. Based on these potential benefits the method of qualitative document analysis of primary publications was selected for the exploration of the research questions. This method is described in more detail in Section 3.7.2.

3.7 Data collection

This section elaborates on the two methods that were used in this research to collect research data. The data for this research was sourced through the two methods; qualitative semi-structured expert interviews and qualitative content analysis of primary publications. The aim was to combine these two methods to have a high validity and

reliability through the verification of subjective findings. The aspect of validity is outlined in Section 3.3.

3.7.1 Qualitative semi-structured interviews

This section outlines the method of qualitative semi-structured expert interview, which was used to harvest primary research data. Methodological literature mainly labels this form of interviews as 'Standardised Open-Ended Interviews' (Turner 2010). The interviews target the opinions and perspectives of selected members within the collaborative groups PSF and SCP Roundtable, government representatives and experts from industry and civil society. The focus evolved around the perception on food sustainability. To gain a suitable depth of information it was necessary to use an approach that allowed for open and flexible answers to the interview questions. Standardised open-ended interviews are characterised by a high degree of structure with pre-planned questions. The use of semi-structured interviews allowed a degree of standardised questions, as the interviewees were asked the same questions, which helped to compare the harvested research data. At the same time the interview questions had a narrative nature that allowed interviewees to add detailed information and ask clarifying questions when necessary (Bryman 2015).

This high level of flexibility for clarifying and probing on certain aspects during the interview appeared more suitable than using a highly standardised method with little or no flexibility. This research approach allows the interviewee to fully express viewpoints and experiences (Byrne 2004; Flick 2009; Turner 2010; Ritchie et al. 2013; Bryman 2015). Prior to the interview phase, a pilot interview was conducted with two colleagues from the Centre for Food Policy at City, University of London. The use of piloting the interview is often regarded as a crucial element as "*the pilot can alert them [the researcher] to elements of their own interview techniques that support the objectives of the study and to those that detract from those objectives*" (Seidman 2013, p.42). The pilot also helped to ensure that the interview questions follow a logical approach, were clear and produced data that helped to answer the research questions.

The first step of the interview process was to address the interview questions chronologically to the interviewee. The interviewee was confronted with these questions for the first time at the interview. When possible, the interviews were held face-to face. Alternatively, phone or Skype was used. This depended on the time schedule and geographical distance to the interviewees. Each interview was recorded on an audio recorder for the purpose of reference and authentication. To ensure the compliance of research ethics and to inform interviewees about their rights a consent form was given and signed by all interviewees prior to the interview recording (see Annex C). The audio recordings were later transcribed and the transcriptions were later used to analyse and compare interview content.

There has been some criticism that interviews are used too often in research for data collection in a so-called 'interview society'. For Silverman (2004) an 'interview-society' describes an over-use of interviews in the society. This is particularly reflected in "*the number of television news programs, daytime television talk shows, and newspaper articles that provide us with the results of interviews*" (Silverman 2004, p.140). This situation can lead to the use of interviews regardless of its suitability to the research project (Silverman 2004). Another critique is the interaction between the interviewer and the interviewee during the interview process. As noted by Ritchie et al.:

> *"the role of the facilitator is an active, not a passive, one. It does not mean sitting back and just letting the interviewee talk. On the contrary, it means managing the interview process to ensure that the required subjects are covered to the required depth, without influencing the actual views articulated" (Ritchie et al. 2013, p.147).*

To ensure that the given answers are not biased or influenced by the researcher, open questions were included. Despite these criticisms, the use of interviews was essential in this research as it was a challenge to pragmatically and efficiently harvest data on the perceptions of individuals through an alternative method.

The researcher ensured a 'neutral' and professional interview process by conducting two pilot interviews. With the feedback and knowledge from the pilot interviews, the researcher conducted the interviews in a professional manner by ensuring compliance

with research ethics. The main target groups were foremost, constant and active individual members of the two collaborative platforms PSF and SCP Roundtable. It was important to capture the perceptions of individuals that are regular, long term and active members, as the literature reflected that mechanisms of collaborative learning can occur over longer time periods and require active participation.

The recruitment process of the interviewees had two phases, and all 25 interviews were conducted within a period of three months. The first phase included using the help of gate keepers within the Centre for Food Policy at City, University of London to get in contact with potential interviewees. This included the sending of interview requests via emails to the potential interviewees. After having successfully interviewed the first members of the two collaborative platforms, it was possible to use those interviewees as additional gate keepers. Phase two was based on a snowball-system through which it was possible to gain access to a more exclusive pool of members.

In total, 25 interviews were conducted for this research, of which 19 were members of the PSF or SCP Roundtable. A detailed list of interviewees is set out in Table 3.8.

Table 3.8 Interviewees by case study

Interviewee / Affiliation	Code name of interviewee
Interviewee 1 /PSF	6C
Interviewee 2 /PSF	5C
Interviewee 3 /PSF	3IU
Interviewee 4 /PSF	3GU
Interviewee 5 /PSF	2IU
Interviewee 6 /PSF	5IU
Interviewee 7 /PSF	1IU
Interviewee 8 /PSF	3C
Interviewee 9 /PSF	4C
Interviewee 10 /PSF and SCP Roundtable	7IU
Interviewee 11 /PSF and SCP Roundtable	2C
Interviewee 12 /PSF and SCP Roundtable	4IU
Interviewee 13 /SCP Roundtable	3IE
Interviewee 14 /SCP Roundtable	1IE
Interviewee 15 /SCP Roundtable	2IE
Interviewee 16 /SCP Roundtable	1C
Interviewee 17 /SCP Roundtable	1GE
Interviewee 18 /SCP Roundtable	1IE
Interviewee 19 /SCP Roundtable	7C
Interviewee 20 /External Expert	8IU
Interviewee 21 /External Expert	4IE
Interviewee 22 /External Expert	4GU
Interviewee 23 /External Expert	2GU
Interviewee 24 /External Expert	1GU
Interviewee 25 /External Expert	6IU
Industry actor EU: IE Government actor UK: GU Civil Society actor: C Industry actor UK: IU Government actor EU: GE	

Source: Author

The interviews were conducted with five open-ended interview questions which had been developed in relation to each of the four research questions. Some of the questions had to be slightly adapted depending on whether the interviewee was a member of the investigated collaborative groups or an external expert. Appendix A includes the case study protocol and the five interview questions.

3.7.2 Qualitative document analysis of primary publications

The following section elaborates on the method of qualitative document analysis that was used in this research. As explained in the literature review, according to Nonaka, one way that actively demonstrates the creation of collaborative knowledge is written physical manifestations of this knowledge (Nonaka and Takeuchi 1995; Nonaka 2006).The process of fixating and writing down knowledge emphasises not only the importance of that specific knowledge to the collaboration, but also demonstrates the collective's awareness of having learned something. Such collaborative knowledge becomes visible through physical and online content published by the collective.

The analysis of published material is not only useful to investigate collaborative knowledge but can also help to understand a collective's key objectives, organisational structures, self-presentation, targeted stakeholders and strategies of promoting their knowledge. This research has used a qualitative document analysis which refers to:

> "*a systematic procedure for reviewing or evaluating documents—both printed and electronic (computer-based and Internet-transmitted) material. Like other analytical methods in qualitative research, document analysis requires that data be examined and interpreted in order to elicit meaning, gain understanding, and develop empirical knowledge*" (Bowen 2009, p.27).

This procedure of data harvesting is similar to a qualitative content analysis which can be understood as:

> "*an approach to documents that emphasizes the role of the investigator in the construction of the meaning of and in texts. There is an emphasis on allowing categories to emerge out of data and on recognizing the significance for understanding the meaning of the context in which an item being analyzed (and the categories derived from it) appeared*" (Bryman 2015, p.285).

Compared to a purely textual document analysis, this research has also investigated non-textual material, such as charts, graphs or posters that were published by the two collaborative platforms. Similar to a qualitative content analysis, a systematic coding scheme was applied for the analysis of these documents (Hsieh and Shannon 2005). The coding scheme that was applied in this research project focused on identifying key

themes that correlated with the subject of each of the four research questions. A more detailed outline on how the research data was analysed is set out in Section 3.9.

First and foremost, the selection of material included textual primary material that was produced and published by the PSF and the SCP Roundtable. The rationale was to focus the data collection on how the two case studies PSF and SCP Roundtable 'presented' themselves. This included the types of knowledge they saw as important within food sustainability and their approach in developing solutions to food sustainability challenges. The material was manually filtered by the researcher and broken down to more relevant and manageable bits of data (Weber 1990). The outcome of the qualitative content analysis also helped to formulate interview questions in a more efficient and targeted way. This benefitted the interview process as it enabled the researcher to be more engaged with the interviewed members of the collaborations.

Documents on the PSF and the Food SCP Roundtable were mainly harvested and searched through the respective webpages of both collaborative platforms. Almost all available content on the PSF and SCP Roundtable was considered, including uploaded documents, presentations and info-graphics, as well as the webpage content itself. The fact that PSF was formed in 2011 and the SCP Roundtable in 2009 provided the research with a manageable amount of data. Particularly relevant were documents such as annual reports, power point presentations and the online content on the webpages. A detailed list of the investigated publications and material are presented in Appendix B.

There has also been some criticism of the document analysis approach. This mainly revolves around the argument that documents are not necessarily accurate, truthful or neutral. Every report, presentation or chart is produced and addressed to a specific audience. It was therefore important for the researcher to maintain a critical stance when analysing documents of the PSF and SCP Roundtable, as their published material is likely to be aimed at a certain target group, such as policy makers or stakeholders in the food system. In addition, the document analysis included the insightful consideration of targeted groups and aims of the published material (Yin 2013). Some

content that needed further clarification was brought up during the interview phase with the individuals that had published or written that content. This helped to test the researcher's prior conclusions and interpretations. If possible, content that is presented as facts in the analysed documents was compared to other sources and statements from the interviewees.

A further potential criticism of document analysis is that the pool of documents might have been filtered or manipulated by the two collaborative platforms, which could lead to a biased picture (Yin 2013). As mentioned earlier, the majority of the analysed documents in the scope of this study are publicly available. The only authorisation required for access to restricted content was given by the PSF for their Knowledge Base database, which is for internal member use only. The access that was given to the researcher is identical to the that given to the members of the PSF. There was no evidence to suggest manipulation of any of the data on the database since it was submitted.

3.8 Literature review

This section outlines how relevant literature was sourced and selected for this research. This includes a rationale on why certain bodies of literature have been selected in the three areas of: (I) organisational knowledge and the relationship between knowledge and policy, (II) collaborative platforms, (III) food sustainability. The literature was sourced and selected through the following different multiple steps:

a) Search of City, University of London online library sources and databases from Scopus, Research Gate, Journal Storage and Springer Link, by using relevant key words related to the three bodies of literature areas. Search results were briefly analysed by reading through titles and abstracts and relevant papers were virtually stored by literature area and alphabetically by author(s).

b) Using the online platform Google Scholar by searching for relevant publications through the same approach as in stage a)

c) Review of publication lists of authors appearing multiple times in stage a) and b). Through this 'snowball' approach, authors from the publication lists were explored further to source publications that have not been considered in stages a) and b).

The field of collaborative knowledge on food sustainability draws on a wide range of literature and disciplines ranging from food sustainability, knowledge management, science policy, politics, food industry and sociology of organisation to epistemology, philosophy and ethics. Thus, to explore the academic literature for this research, a multi-disciplinary approach had to be taken in the search for the appropriate body of literature. The literature search was mainly conducted between October 2014 and September 2016 (see Table 3.9).

Table 3.9 shows that the literature was drawn from a broad range of academic disciplines. Especially the fields of business management and environmental policy were a vital source on collaborations and knowledge creations/utilisations. Literature on the relationship between knowledge and policy was mainly located in the field of scientific expertise and policy making. This included literature on the role of research in policy fields, such as environmental or health policy.

Each area of interest was explored with the use of academic search databases. Literature concerning the two case studies was sourced from the online databases of the PSF and SCP Roundtable. The material on these databases were publicly available and free to access. The researcher's motives behind sourcing only from the publicly available material of the investigated collaborative platforms were to understand how these collaborations represent themselves how they place themselves within the sustainability and what type of knowledge they create and promote. The content of the published material by the PSF and SCP Roundtable was analysed through a content analysis as part of the data collection. The content analysis method that has been used in this research project is elaborated in Section 3.7.2. There is currently no academic literature that specifically elaborates on the SCP Roundtable or the PSF in the context of

collaborative knowledge and food sustainability. This again underlines the importance of this research.

All sources were systematically looked through for key terms and words relating to each area of interest. Table 3.9 also reveals an overview on the results from this literature sourcing approach. These include the types of academic journals and key authors that were identified as useful for this research. These results also helped to find additional literature through the exploration of further academic material from those key authors and journals. This was particularly valuable since some important literature was not picked up in the first step of literature exploration through predefined key words.

Table 3.9 Strategy and overview of the literature research				
Segments / areas of interest	**Organisational Knowledge / The relationship between knowledge and policy**	**Collaborative platforms**	**Food Sustainability**	**Case Studies: Product Sustainability Forum and European Food SCP Roundtable**
Period of literature review	October 2014 September 2016	October 2014 September 2016	October 2014 September 2016	October 2014 September 2015
Library/ database research	City, University library of London (online and physical), Google Scholar	City, University library (online and physical), Scopus, Research Gate, Journal Storage and Springer Link Google Scholar	City University library (online and physical), Google Scholar	PSF and SCP Roundtable online database
Search key terms	'knowledge management'; 'learning'; 'knowledge transfer'; 'knowledge creation'; 'collaborative knowledge'; 'knowledge in policy'; 'public policy and knowledge'; 'knowledge and power'	'collaboration'; 'policy and collaboration; 'networks; 'organisation'; 'public private partnerships'; 'interest groups'; 'lobbyist groups'; 'food collaborations'; 'food networks'	'sustainable development'; 'food sustainability'; 'environmental sustainability'; 'Nachhalitgkeit'; 'collaboration and sustainability'	N/A
Journals (beside academic books)	Academy of Management Review, Administrative Science Quarterly, American Journal of Agricultural Economics, Business Strategy and the Environment Business, Strategy and the Environment, Human Relations,	Australian Journal of Public Administration Environmental Conservation Environmental Policy and Governance Journal of Economic Issues	British Food Journal, Environment and Planning, International Journal of Sustainability in Higher Education,	Reports, Presentations and Online content published by the PSF and SCP Roundtable

	International Journal of Organizational Analysis, International Philosophical Quarterly, International Public Management Journal, Journal of International Business Studies, Journal of World Business Organization Science, Policy Studies Journal, Public Administration Review, Science and Public Policy, Strategic Management Journal, Technology Analysis & Strategic Management,	Journal of Environmental Policy & Planning Journal of European Public Policy Journal of Public Administration Research and Theory Journal of World Business Policy Studies Journal, Social Policy & Administration Strategic Management Journal The Journal of Applied Behavioural Science	Social Policy & Administration, The Geographical Journal, Third World Quarterly	
Key Authors	Gray; Innes & Booher; Mowery et al. ; Simon ; Tsang ; Sporleder & Moss; Clarke & Roome; Lozano; Parsons; Weiss; Taylor; Radaelli; Nonaka; Liebowitz; Huestedt; Foucault; Beck;Huang & Yu; Kohn; Argyris & Schon; Romme & Van Witteloostuijn; Doppelt; Simon; Knight; Inkpen; Nahapiet & Ghosal; Bryant; Haas; Stone; Johnes & Baumgartner	Huxham; Gray; Thomas & Perry; Emery; Trist; Pellocelli; ngram; Williams; Ansell & Gash; Lewicki; Clarke &Roome; Lozano; Ostrom; Lang and Heasman; Sorensen & Torfing; Bell and Hindmoor,	Lang, Barling, Caraher, Fadeeva; Sage, Schmidheiny; Starik & Rands,	Product Sustainability Forum; SCP Roundtable

Source: Author

3.9 Data analysis

This section outlines how the collected research data was analysed. As interview recordings were transcribed into a text and the analysed documents exclusively consist of text or images, all analysed data is in written or graphic form. The interview transcripts have been created by the research through the interview recordings. Transcription was conducted by the researcher using a transcription pedal and the transcription software, The FTW Transcribe. This helped to provide higher accuracy and efficiency in the transcription process. Transcribing the interviews also had the benefit for the researcher to become more familiar and engaged with the interview content, in comparison to using only audio recordings or taking notes during the interview.

The basis for analysing the textual content of the transcripts and documents was a qualitative content analysis, which is defined in this research project as "*a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes or patterns*" (Hsieh and Shannon 2005, p.1278). The systematic analysis of the research data was based on two analytical techniques, which should lead to a story based approach (Yin 2013). The first analytical approach was to identify key objectives that related to the research questions. This included the identification of the following from the research data:

- collaborative learning and knowledge sharing practices and mechanisms within food sustainability.
- types of knowledge that are regarded by stakeholders as important in food sustainability.
- impacts on food sustainability through knowledge that has been produced by the two collaborative platforms SCP Roundtable and PSF.

This first analytical strategy included the testing of the theoretical concepts set out in Chapters I and II. This helped to identify similarities and differences of the research findings in relation to theoretical propositions. The first analytical strategy guided the researcher to discover collaborative practices on learning and knowledge sharing in the

context of food sustainability, including the knowledge impact on the wider food sustainability.

The second analytical approach of this research was the case description. This strategy consisted of the description of the two collaborative platforms PSF and SCP Roundtable. The rationale behind this strategy was to have a good understanding of the two collaborative platforms and to better interpret the research findings from the first analytical strategy and put these in context.

The 'raw data' was organised through a coding framework that was applied through textual analysis software NVivo 11. The use of a computer programme allows for a quicker coding process, as the manual coding of large amounts of textual material can become time consuming. At the same time, a computer textual analysis programme can also reduce the risk of human errors. The manual coding of large amounts of text can be repetitive for the researcher and make it difficult to focus. At the same time, the researcher is aware that computer-based coding of data might give a misleading picture, as computers have a strict systematic approach compared to human beings. Compared to humans, computers are for example not able to understand complex syntax within textual materials (Krippendorff 2012). To ensure that the computer-based coding of data is coherent and reflects the intended themes, the researcher has overviewed and controlled each coding manually. This included reviewing each code and cross-checking it with the coded text and its syntax. NVivo 11 was only used to organise the textual material but it was not determining the applied coding logic. The rationale for the coding framework was developed through the three preliminary themes; collaborative learning, collaborative knowledge, and impact on food sustainability. These themes were broken down into more detailed themes and organised through NVivo11. This process led to some of the 16 key themes that relate to each of the four research questions. Additional themes were identified through the literature review since they were seen as significant by scholars. These key themes are used throughout this thesis in the data presentation and analysis to ensure a systematic and coherent flow. The 16 themes are outlined in Chapter four. The researcher ensured a manageable coding procedure and avoided over-coding by reviewing the coding framework regularly and

reflexively. A clear, focused and manageable coding framework was particularly useful in targeting elements that were useful for answering the research questions and focus on the research objectives.

This first stage of data coding was categorising the findings in relation to each research question through a set of key-words and phrases. These findings are set out in Chapter four and aim to be descriptive and use the language of the actors interviewed with only minor interpretations. This first stage contains less analysis going beyond the research data as this is a separate stage. This second stages includes an analytical technique that aims to analyse the findings in correlation to theoretical concepts. The second technique used was explanation building. According to Yin, explanation building is a process that reflects the explanation of 'how' and 'why' of phenomena that are reflected in the research. This analytical part is outlined in Chapter five. The technique of explanation building was conducted by analysing the coded data in relation to the models and theoretical propositions described in Chapters one and two. According to Yin, the analytical technique of explanation building goes through six stages (see Table 3.10).

Table 3.10 Stages of the explanations building process in a case study research design

Stage 1	Making an initial theoretical statement or an initial proposition about policy or social behaviour
Stage 2	Comparing the findings of an initial case against such a statement or proposition
Stage 3	Revising the statement or proposition
Stage 4	Comparing other details of the case against the revision
Stage 5	Comparing the revision to the facts of a second, third, or more cases
Stage 6	Repeating this process as many times as is needed

Source: Author's own table after Yin 2013, p.128f.

Yin describes this gradual process of explanation building as a process of refining a set of ideas. The researcher was also aware that the analytical technique of explanation building is linked to some potential criticism, as the researcher is the one that builds explanation through interpreting and analysing the findings. This can lead to a situation of moving away from the original research findings and research focus. To avoid this, the researcher has regularly reviewed the outcome of the interpretation with the original research findings to ensure a clear and convincing correlation.

3.10 Structure for data presentation and analysis

This section outlines the structure and framework that was used in this research. The research used concepts of contemporary sustainability challenges which were put into a wider context (see Chapter one). These perspectives set the frame of what is understood as a wider food sustainability in this research. The correlation between collaborative platforms and sustainable development is key. Based on the work of Lozano, collaborative multi-stakeholder platforms are regarded as a beneficial structure to create and share knowledge to counteract unsustainable practices in the food system (Lozano 2007; Lozano 2008).

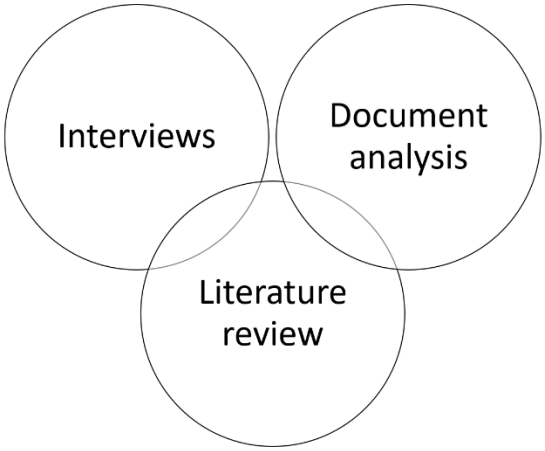
The two case studies of this research project are food related collaborative multi-stakeholder platforms. The research has therefore developed a definition of a collaborative platform by combining core elements of nine definitions from the literature (see Section 2.1.1). The researcher's understanding of collaborative platform is accompanied by a two-sided perspective of the advantages of collaborative structures. The internal collaborative processes of knowledge creation and sharing in the two investigated collaborative platforms have been analysed on the basis of literature relating to organisational and collaborative learning and knowledge sharing (see Chapter one and two).

The two case studies PSF and SCP Roundtable are understood as collaborative platforms that operate on a pre-competitive basis and the researcher has therefore viewed all collective processes of knowledge creation and exchange through a lens of non-competitive or pre-competitive behaviour and motives (see Section 2.1.6). In this regard, the focus is particularly on the work of Huang & Yu (2011), Fadeeva (2005) and Coglianese (1999). The research has not only analysed internal processes and structures of collaborative platforms, but also the effects of collaborative knowledge on the wider food sustainability. This includes concepts on governance that describe the relationship between interest groups, such as food related collaborative platforms and the state. In relation to that it is critical to understand the role of collaborative platforms in governance arrangements and their knowledge impact. Knowledge is a central element

of this study and it is important to reflect on the wide range of concepts relating to collective learning and knowledge sharing. This research used concepts of Innes, Nonaka & von Krogh (2009) and Liebowitz (1999), to outline and define the nature of the term knowledge. The researcher understands the term knowledge and learning as tangible and intangible entities, but also as tools of power and ideology (see Chapter two). The concepts of Innes and Booher (2010) on knowledge use in public policy are key for the understanding of knowledge in this research.

This thesis has used 16 themes to guide and organise the presentation and analysis of the research findings. The researcher's aim was to provide a structured analytical string that provided a conclusive link between the presentation and the analysis of the research findings. These 16 themes were chosen and developed by the researcher based on the conducted interviews, analysed documents and existing literature (see Figure 3.7).

Figure 3.7 Identification methods for the 16 themes



Source: Author

The interview transcripts were thematically colour coded by the researcher using a textual analysis software. This process guided the researcher in selecting and developing themes that reflected the interviewees' perception and helped to answer the research questions. Some themes were selected when a relatively high number of interviewees had mentioned the theme or its characteristics. Themes were also chosen if existing literature found them to be significant and they were mentioned or acknowledged by

interviewees or in documents. Other themes have been chosen because of their significance within the analysed documents of the PSF and SCP Roundtable. A more detailed explanation of why certain themes has been selected is provided under each section in Chapter four and five.

3.11 Ethical consideration

This section elaborates on the ethical considerations of this research. The researcher ensured that during this research no participant experienced any level risk or stress in relation to their daily work and life. All interviewees were professional experts that work in high profile positions at private companies, NGOs or governmental institutions. The interview process was often considered a routine task by the interviewees as public engagement and involvement in media coverage was part of their professional work life. The interviews were held either at a location and time chosen by the interviewee or via phone or Skype. This ensured lower stress impact, as the interviewees were able to choose a time and surrounding, they found most comfortable and convenient. The interviews only involved questions on topics that were related to the interviewee's professional work and experiences. Thus, interviewees were reinsured that no questions on any personal and private issues would be raised. Prior to the interview, the researcher sent to each participant an email that included a short abstract of the research and a general indication of which interview questions the interviewee could expect. This interview introduction was aimed at making the interviewees more comfortable with the interview request and reassuring them about the credibility of the researcher.

It was critical for this research to obtain research data from the interviews that was authentic, honest and reflected the views of the interviewee. This aspect might lead to situations where participants felt conflicted or uncomfortable and thus, interviewees might not have answered fully or honestly. To counter this possibility, anonymity and confidentiality of the data was taken into account. Participants were reassured that the research data obtained from the interview would be kept anonymous. The consent form

made it possible for the interviewees to remain anonymous have their names and organisations omitted from the thesis and any publicans. At the same time, the names of interviewees were not important for the findings and they could therefore be anonymised without implications for the research. Therefore, after the data analysis phase, the researcher decided to anonymise all interviewees. Due to the small number of interviewees and the small field, it was challenging for the analysis and interpretation of the research data to maintain complete anonymity throughout this process. The researcher made the interviewees aware of this potential situation prior to the interview. All participants were given a consent form and a participant information sheet that included key information on the research focus, aims and scope. The interviewees were made aware through the consent form that all obtained research data would be securely stored and protected from unauthorised access.

The research ethics committee of the Sociology Department at City University of London granted the ethical approval for this research. The ethical approval issued by the Senate Research Ethics Committee of the City University of London can be found in Appendix C, which also includes a blank consent form and participant information sheet.

3.12 Summary

This chapter outlined details on how the research was conducted and thus, focused on the research questions, analytical framework, selection of case studies, used and considered methods, ethical considerations and safeguard of an overall robust research procedure.

The aim of the research questions is the explore the role of food industry led collaborations in food sustainability and in particular explore their collaborative learning mechanisms, what types of knowledge they produce and how that knowledge impacts food sustainability. The research and this thesis evolve around the following four research questions:

RQ1. Why are actors in the food system collaborating in multi-stakeholder platforms in the context of food sustainability?

RQ2. How do food industry led collaborations create and transfer knowledge in the context of food sustainability?

RQ3. What types of collaborative knowledge are valued by actors that participate in food sustainability?

RQ4. What impacts on food sustainability do food industry led collaborations have through their knowledge?

The first research question explored the fundamentals of this thesis by looking at the reasons of stakeholders to participate within collaborations that focus on food sustainability. The second research question focuses on internal mechanisms of collaborations regarding their learning and knowledge capabilities on food sustainability. The third research question explored the types of knowledge that are produced and valued by food industry led collaborations in relation to food sustainability issues. The fourth research question brings the previous research findings together and explores the impact of collaborative knowledge ion food sustainability.

All four research questions reference back to existing literature and in particular to the existing gap in the literature. The literature was analysed systematically by considering a variety of academic sources and predominantly utilised most recent publications and widely recognised key literature. This thesis and research are situated within the food policy discipline and analysed collaborative platforms as knowledge hubs through a food policy lens. The four research questions give food policy a voice and the ability to be present in disciplines such as knowledge management or interorganisational learning and psychology.

In order to bring the research questions ‘alive’ the research has analysed the two food industry led collaborations Product Sustainability Forum (PSF) and The European Food Sustainable Consumption and Production (SCP) Round Table. The foundation of this approach is based on a multi-case study research design which allows to investigate academic and real world problems through the analysis of different case studies and

allow to draw a conclusion from the research outcomes. A key element of this design is to ensure a coherent and logic approach in selecting the 'right' case studies and demonstrate the reasoning for not selecting other case studies. Seven criteria for the case study sampling were applied (see Section 3.4) in this research based on (I) case study literature, (II) findings from previous research that has used multiple case studies (see Section 2.1) and (III) pragmatic reasons for conducting the research. The first stage of the sampling process revealed 12 potential case studies of which the PSF and SCP Roundtable were selected for this research. Both collaborations identify themselves as knowledge creators and providers in food sustainability with the aim to influence broader and more specific food sustainability issues.

The Product Sustainability Forum (PSF) is a UK-based food industry led collaboration that was formed in 2011 by the UK, Scottish, Welsh and Northern Irish governments and involves different actors from the food value chain, including grocery retailers, suppliers, academics, NGOs and UK government representatives. The second case study, the European Food Sustainable Consumption and Production Roundtable (SCP Roundtable) is a voluntary food industry led collaboration that was formed in 2009 in Brussels and co-chaired by the European Commission (EC).

This research has considered several quantitative and qualitative research methods for the purpose of data collection. In order to explore the two collaborations, it was clear from the outset that since this research focused on the way collaborations learn and create knowledge, predominantly qualitative research methods were considered. The literature review in Chapter two has demonstrated that learning is often an individual, personal experience and best expressed through explaining rather than numeric statistics. After considering methods such as 'qualitative surveys', 'focus group', 'observation' or 'interviews the research was conducted through the two methods 'qualitative semi-structured interviews' and 'qualitative document analysis'. In total 25 members from both collaborations, relevant government bodies and other relevant stakeholders. More than 15 documents and online web content from the SCP Roundtable and PSF were analysed. All documents were produced and published by the two collaborations as this was critical for exploring the actual knowledge output and

ideological position of the collaborations.

The research data from the two methods was gathered and recorded through textual interview transcripts and textual notes form the analysed documents. In order to provide a structure and scientifically sound approach in evaluating and analysing the data, an analytical process was followed by the researcher. Interview transcripts and documents from the content analysis were manually coded through digitally through a textual software programme. The coding scheme for this process was based on several factors such as how often something was mentioned by interviewees or the significance of an issue based on key literature. The coded data was analysed in two stages. First recalling the content as stated by the interviewee or analysed document and second going beyond the 'face-value' and analyse the meaning and wider impact of the data. Later is particularly relevant for the testing of the research findings of existing theoretical concepts set out in Chapters I and II.

This chapter has not only outlined how the data was analysed but also the approach that was taken regarding data presentation and the integration of the findings into the structure of this thesis. Since the core aim of the research was to find answers to the four research questions (see Section 3.1) the entire data presentation and data analysis is structured after each research question. This allows on the one side a coherent and structured approach in systematically elaborating the research findings to the reader. On the other side it helps to create a strong link within the thesis between the data presentation and the analysis of that data.

In order to conduct this research in an ethically appropriate manner and to be in line with the ethical conduct for research of City University of London, the researcher demonstrated in this chapter necessary ethical considerations. The researcher ensured that during this research no participant experienced any level risk or stress in relation to their daily work and life.

The research fundamentals that were outlined in this chapter are significant for the following chapters regarding the research findings (Chapter four) and the analysis of these findings (Chapter five). This methods chapter provides validation and reliability of the researchers argumentation and contribution to the academic body of knowledge

and to be valued as a recognised by other academics. After having outlined the fundamentals of how this research was conducted, the following Chapter four outlines the research findings. At a later stage in Chapter five these outlined findings are analysed and put into a theoretical context.

4 Chapter Research findings

This chapter describes the research findings and is based on the outcome of the interviews and document analysis. The sections in this chapter are organised in relation to each of the four research questions. Each of these sections are organised according to the 16 key themes that emerged through the thematic analysis of the data and literature review (see Table 4.1).

Table 4.1 Key themes and their relationship with the research questions

	RQ1 Themes (Motives)	RQ2 Themes (Knowledge activities)	RQ 3 Themes (Knowledge output)	RQ4 Themes (Knowledge impact)
Themes of RQ#	Theme 1: **The finding of common and shared understanding of food sustainability**	Theme 4: **Agenda setting and power distribution**	Theme 10: **The organisation of existing knowledge**	Theme 14: **Concrete and direct food policy recommendations**
Themes of RQ#	Theme 2: **Unsustainable practices and their tangible effects on the food system**	Theme 5: **Formal vs. informal forums**	Theme 11: **Organisational knowledge on food systems**	Theme 15: **Improved understanding and exploration of food sustainability**
Themes of RQ#	Theme 3: **The 'bandwagon effect' and the presence of respected actors**	Theme 6: **The role of competitiveness and trust in collaborative learning**	Theme 12: **The dominance of ''scientific knowledge''**	Theme 16: **Voluntary Industry led changes with the aim to improve food sustainability**
Themes of RQ#		Theme 7: **Collaborative joint activities**	Theme 13: **Knowledge on the nexus of food sustainability and business**	
Themes of RQ#		Theme 8: **The role of knowledge broker and external experts**		
Themes of RQ#		Theme 9: **The role of online platforms in knowledge sharing and learning**		

Source: Author

These 16 themes derived from a blend between the results from the literature review (see Chapter two), the conducted interviews and the document analysis. Some themes were selected as they were regarded as significance by the literature, such as agenda setting (see Theme 4). Other themes derived particularly from the interviews, as a number of interviewees have mentioned the importance of those themes in relation to

collaborative learning and food sustainability, such as the role of a 'knowledge broker' (see Theme 8). At the same time some themes such as the role of joint case studies (see Theme 7) were selected due to their significance in publications published by the PSF and SCP Roundtable. In most cases the themes were selected because of their importance for more than one source. More than half of the themes were mentioned by interviewees, in analysed documents and in the literature review at the same time. The theme on 'the common and shared understanding of food sustainability' (see Theme 1) was developed through all of the three sources interviews, document analysis and literature review. The themes were identified as significant because of their popularity during data collection. Most of the 16 themes were mentioned by several interviewees (not only one) and were also featured multiple times across the analysed documents.

In addition to this selection process, the themes were also identified as critical because of their relevance for each of the four research questions. This relevance and correspondence between themes and research questions forms the foundation and structure of the findings chapter (see Chapter four) and analysis chapter (see Chapter five).

Each theme forms a dedicated section under one of the four research questions.

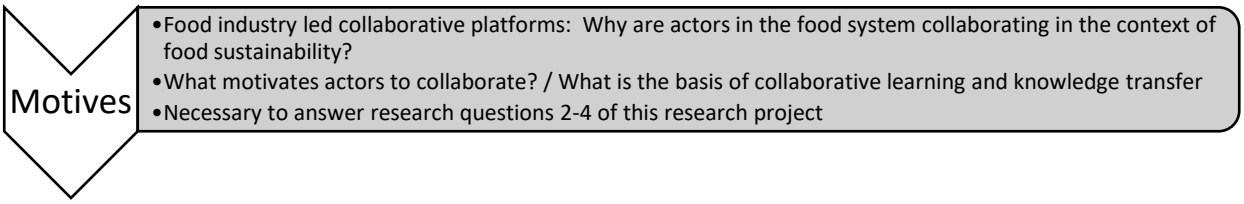
The findings chapter and the analysis chapter have the same structure with the same themes as this provides a strong link between the findings and the interpretation and discussion of those findings. It allows the reader to navigate thematically through the results of this research by having a clear and comprehensive structure that always refers to each of the four research questions.

4.1 RQ1: Motives for participating in collaborative platforms

RQ1: Why are actors in the food system collaborating in multi-stakeholder platforms in the context of food sustainability?

The following section outlines the findings on the motives of actors within the food system to join a collaborative platform in the food system. The research findings outlined in this section relate to the first research question of this research (see Figure 4.1).

Figure 4.1 Logical structure of the research questions: Motives



Source: Author

The motives of actors can have a vital impact on collective knowledge sharing and learning, since they form the basis of any activity within the collaborative platform. According to some interviewees, when regarding industry led collaborative platforms, the following question is particularly important and should be raised:

> *"...why should they spend their time away from their hugely busy day to come to discuss something and I think there are too many places to collaborate, too many people using the loose language of collaboration, but it has to be good for business and it has to be good investment in their time. So I think it needs to be, what is the galvanising benefit to the company that they should participate and contribute and if you don't answer that question than everything is doomed to fail" (4IE).*

Thus, it became clear that motives of the participating members play a key role for this research in understanding the collective activities. Motives that bring different actors together can also be an indicator to have likeminded actors involved in a collaborative platform.

4.1.1 The finding of common and shared understanding of food sustainability

According to members of both collaborative platforms, a key problem around activities related to food sustainability is the lack of harmonisation of standards, processes and activities across the food value chain. Almost all interviewees either mentioned the lack of a common and shared understanding on food sustainability or gave examples to emphasise the lack of harmonisation around food sustainability. This included the co-existence of a broad spectrum of standards, certificates, methodologies and definitions which adds complexity for actors within the food supply chain. This diversity is especially negatively regarded by food businesses as mentioned by a former manager of a global soft drink company:

> *"…if everybody is working with a different framework, a different standard, using different terminology then there is a serious problem because there is complexity all of their suppliers are now totally confused about what people want because if Walmart has some standard, if Mc Donald's has some standard Tesco and Unilever have standards, everybody is confused. You know I supply all of these but I'm totally confused now what people want and I just cannot manage the complexity of all these different standards. So one of the really important roles is to get that common language and to say what is it we want to achieve as an industry and what standards do we set" (4IE).*

According to a former senior policy maker, the success of a collaboration is often linked to the actor constellation and structure within the collective. According to this interviewee:

> *"…they [collaborative platforms in the food system] can and they cannot work. The idea of course of trying to find common ground between people who start from different positions and have different interests must be a good one and that's what democracy is all about. Different people pulling things around and trying to come to a common position. Sometimes that's exactly right and it achieves collaborative benefits, but nobody gets exactly what they want, but you get a compromise and that's the best that can be managed between the different parties and that's the right way forward. Sometimes that doesn't work so well either the grouping has not been structured right, it's too much under the influence of once rather than the other …"* (4GU).

Economic disadvantages that result from the high degree of heterogeneity of standards in the context of sustainability seem to be of a great concern for food businesses within both collaborative platforms. This aspect described by a former sustainability manager at a large food and drink manufacturer in this way:

> "*It is almost impossible to have a sustainable supply chain unless you collaborate. So collaborations absolutely essential. So you can consider vertically where you can collaborate with your suppliers and I was on the TESCO knowledge hub board on how Tesco engages its supply chains, which you wanted to do to create a platform for all of its suppliers to share information between themselves to help reduce carbon in the supply chain. So that would be good for Tesco and also be good for the suppliers. Essentially reducing carbon saves money, but also trying to share best practice and normalise and de-risk becoming more sustainable"* (4IE).

For the members, the motive to collaborate with other actors from the food system is to develop harmonised standards that help to measure and describe a variety of aspects regarding food sustainability. Core work of the PSF and the SCP Roundtable has been on the development of such common standards in the hope that these will be adopted beyond the collaborative platforms. For members of the collaborations, the lack of harmonised standards and terminologies can lead to an inefficient dialogue between consumer representatives, NGOs, food businesses and governmental institutions.

Practical harmonisation tools that have been produced by the two collaborative platforms are the ENVIFOOD Protocol by the SCP Roundtable and the Hot Spot Analysis approach by the PSF. The interviews indicated that the key challenge within a collaborative platform in developing such harmonised standards and methodologies can be the organisational diversity of its membership. Food businesses and NGOs are particularly aware that "*not all NGOs have the same type of approach and the same understanding and same language and likewise in the business community. There is a huge difference between the way companies like Nestlé is operating as compared to a company like Innocent or company like Unilever*" (6IU). These organisational differences can have effects not only on the development of harmonised standards, but also on their implementation. This was mentioned on several occasions during the interviews for example: "[…] *the whole industry is about improving standards and protocols, but no one is actually using them. That might be a slightly cynical and sceptical view but […] it's partly a self-fulfilling prophecy of the industry*" [6IU]. Interviewees of both collaborative platforms agreed that there needs to be a focus on what types of knowledge are created and shared within the platforms that feed into the process of finding a harmonised ground in the context of food sustainability (see Sections 4.3 and 5.3).

4.1.2 Unsustainable practices and their tangible effect on the food system

The interviewed members of both collaborative platforms primarily outlined their concerns about unsustainable practices in the food system. Particularly food businesses stated that negative impacts on the food supply chain and thus, on their business are no longer an abstract threat. This tangibility can be described as impacts on the food system that are perceived and recognised by individuals in visible, urgent and severe manner. In this regard, the sustainability manager of a global food and drink company explained that:

> *"the tactical business driver behind sustainability and engagement is about long-term security to raw materials. The way it manifests itself is through greenhouse gas emissions and to cut greenhouse gas emissions because we need to be seen we are doing it because that's what the policy guys tell us to do. From the cooperative point of view, yes, obviously if you reduce your energy costs that's good as the accountant likes that so they support it. But overall, if you are the chief executive of a company and you are going to be there typically five to ten years, the climate is not his problem. So outside of cost reduction what is the driver for it? If you say in four to five years you may find your raw material costs have changed or the raw materials availability has changed then they may take a slightly different stand on it" (6IU).*

Understanding food sustainability issues through tangible elements is not only relevant for the economy of food businesses but has also implications on policy making. The need for that tangibility of food sustainability in public policy is based on the argument that "*politicians who direct policy rather make policy […] relate to people not facts and figures*" (6IU).

The importance of tangibility for the members of both collaborative platforms has an impact on preferences about what types of knowledge are shared and created by the collective. This is particularly relevant for knowledge that translates food sustainability issues into a pragmatic, tangible and visible form. This aspect is also linked to the members' motivation of greater tangibility within food sustainability.

For many members of both platforms a key element for developing a more sustainable food system are efficient communication flows within food related collaborative platforms. According to a food industry expert collaborative knowledge on food

sustainability is less about technical aspects of food sustainability, but rather administratively the development of multi-level inter-organisational communication mechanisms. Within collaborative platforms and particularly for food industry actors, the sourcing of knowledge on food sustainability appears to be a matter of building up strong communicative and administrative skills. This argument was particularly emphasised by an NGO representative and food industry expert:

> "*It's not a business that's in a good place right now and it faces many very challenging sustainability pressures as you can imagine. What we found in running a collaboration is you have to have a combination of engaging people, you have to have a change to bring the experts in, because each of these different companies has a huge absolutely enormous body of expertise, but it's also important to speak to people in the company who are more about the communication side of things, more about the brand rather than the technical subject expertise and an opportunity to reach the leaders in these companies to have a mechanism for convening them. So what we find with most of these collaborations is the opportunity to engage at different levels with the experts with the communications and brand teams and then with the leaders inside the company*" (2C).

4.1.3 The bandwagon effect and the presence of a respected actors

The 'bandwagon effect' can be described as a situation where members were primarily motivated to join a collaborative platform by following other respected actors that had already joined the platform. This theme was selected by the researcher as it was explicitly mentioned by the interviewees during the interviews or interviewees pointed out the importance of understanding other stakeholders from industry, government and civil society.

The 'bandwagon effect' is especially reinforced if key competitors or respected authorities have a membership to the collaborative platform. Members that have 'jumped on the bandwagon' can also be characterised as actors that fear to miss out on important developments or being part of a group that can hold a strong united bargaining position. Thus, retailers for example want "*to be part of something that can scale up. That may or may not leave that retailer to end up being in a stronger position or at least in an as good position as everybody else*" (5C). Particularly the membership of larger international food and drink manufacturers, such as Nestlé, Unilever or Coca

Cola motivated other actors across all sectors of the food value chain to join and participate in the collaborative platform.

It is not only the membership of competitors or large food businesses, but also the presence of highly respected actors that can motivate other actors to join a collaborative platform. This is especially the case for the PSF which has members that were attracted by the presence and role of WRAP. In the past WRAP has been in charge of the Courtauld Commitment and has proven to be a strong facilitator that is able to bring different actors across the food chain together and deliver respected outputs. This quote represents the views of many interviewed members of the PSF:

> "*There was a whole range of actors of course the guys from WRAP, there were manufacturers and trade associations such as the BRC, there were NGOs and academics, government officials, so basically all the players were in the room. I think this is the key to all of this what the role of WRAP and particularly the approach that the people at WRAP did; WRAP was government funded, but it was very much and still is a very highly respected independent broker, bringer of expertise, high level of integrity with them. What really mattered here was that they were the convenor of all the different supply chain players" (7IU)*.

WRAP officials are aware of their important role and understood that without their active diplomacy efforts, the PSF would potentially not exist in its current form. According to a WRAP official, key elements of this are based on good communication skills and trust building. For this interviewee:

> *"You need extremely good communication skills and engagement skills, because you are persuading people to get in a room together that very often haven't met, a lot of them wouldn't initially understand what the objective is of the project, so you really have to communicate very often initially bilaterally with the different actors in the value chain and collectively and it's not just getting them in a room, it's about trust building. It's really important to get that trust because in many value chains, the retailer is the enemy of the farmer and vice and versa. So it is reducing that level of sensitivity and making sure that the project you shape with all of the actors delivers a benefit to all of them" (3C).*

The aspect of trust building also underlines the members' perception of WRAP as a guarantor that provides if necessary, confidentiality to members who share sensitive data. This 'bandwagon effect' is closely linked to the element of competitiveness within collaborative platforms and can play an essential role in collective knowledge sharing

and learning mechanisms, as shown in the literature review (see Section 2.1.6). Across the majority of PSF members there is a high level of trust in WRAP's experts who analyse, translate, simplify and codify shared knowledge. This especially applies to large amounts of complex and technical knowledge. According to WRAP officials, some members might find it challenging to understand and interpret that knowledge.

A neutral actor such as WRAP can also act as an intermediary. This can provide a certain level of neutrality to the collaboration in order to bring actors together despite their differences. According to a PSF member and large grocery representative, within collaborations in the food industry:

> "*…the problem you are trying to solve requires everybody else to pull in the same direction to align thinking and to align strategies to know what others are doing, collaborations such as the PSF are very useful. Or sometimes actually they assuming the priorities that you have but in that meeting you can help in that quarter somebody like WRAP or an external actors to take the agenda forward on your behalf* "(1IU).

In a similar manner to WRAP, the European Commission acted as a magnet to some members of the SCP Roundtable to join and participate within the collaboration. The importance of the EC became particularly noticeable for many members when the EC decided to be less involved in the platform. As the EC was not only a member, but also the co-chair of the SCP Roundtable, a decline in their interest was seen by many members to have a negative impact on the platform's infrastructure and was perceived to lead to a loss of political bargaining power within EU. According to the chair of SCP Roundtable's Working Group 1, the decreased interest of the EC is linked to the departure of an individual:

> "*At the beginning this initiative was supported by somebody with the Commission who left for retirements couple of months ago and maybe we have not invested enough in terms of preparing that departure with the colleague to make sure that the person who would replace him would also find interest in this platform, but the fact is when that guy left, people in the Commission started to wonder: 'Ok what was that and is it really so critical for us to be there' and so on and now we have some difficulties and maybe you recalled that from the meeting that my co-chair actually was not in the room it was by video link and it was also his last meeting so I think that's probably a mistake that we have made three or four months ago. Not anticipated enough to replace that person in the Commission which was our key support"* (3IE).

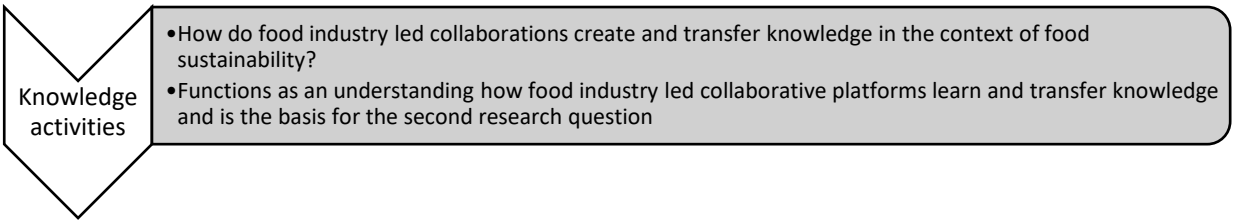
The research findings demonstrate that this ‘bandwagon effect’ is regarded as one motivating factor out of many. For some members the bandwagon aspect was the strongest motive of joining the collaboration at the beginning. Those members claim that after having spent some time within the platform, the bandwagon motive became less important and other motives such as knowledge sharing or the work on food sustainability became the primary motive over time.

4.2 RQ2: Mechanisms and processes of collaborative learning

RQ2: How do food industry led collaborations create and transfer knowledge in the context of food sustainability?

The following section outlines the research findings that relate to the second research question on how the two collaborative platforms PSF and SCP Roundtable learn and transfer knowledge. Thus, these research findings in this section relate to the knowledge activities (see Figure 4.2).

Figure 4.2 Logical structure of the research questions: Knowledge activities



Source: Author

The discussion of collaborative learning in this section is not only about the sharing of knowledge within the collaboration, but also about the creation of novel knowledge through collaborative interactions. Overall this research has found that collaborative knowledge creation and sharing processes are predominantly described by interviewees as systematic, structured activities. These include processes, such as learning through numerical data interpretation or case studies and the structured testing of environmental factors. A number of interviewees also described effective learning environments that entailed a level of diversity, flexibility and creativity. According to a PSF representative, when working collaboratively on food sustainability:

> *"…it's all about maintaining the energy in the room. We have what we call BUZZ sessions on tables, where we say ok we like to have your views on these questions you got 10 minutes. So really kind of punchy approaches to engaging people and that really worked for us and we try to catch a lot visually, so we had group mind maps that everyone could see, so that's really important when you do things like that because you need people to actively see that you are actively listening and capturing what they are saying and we*

found things like mind-mapping, visual road-mapping to be really powerful tools and keeps people talking" (6C).

According to other interviewees, the aim of these kinds of creative learning environments is to create and transfer certain knowledge that would have been less likely to be discovered with a more systematic and structured approach. The creation and transfer of knowledge through creative learning activities were described by some members as attractive and potentially useful for the exploration of useful knowledge in the context of food sustainability. Such creative learning environments were however also perceived by some interviewees as unusual, unfamiliar and inferior compared to more structured, systematic and positivistic learning environments.

4.2.1 Agenda setting and power distribution

The interviews revealed that the members of the two platforms have strong opinions on internal distribution of power, including the power for agenda setting. This became particularly evident, as members of the PSF described on several occasions the strong democratic and equal environment in their platform, whereas some SCP Roundtable members spoke about how certain members were more dominant than other members. Hence, the researcher has decided to use the theme of agenda setting and power distribution to understand its contribution to collaborative learning and knowledge sharing.

Within collaborative platforms an imbalance of powers can lead to a situation where the collaboration is dominated by one or a few actors. This aspect is particularly relevant for knowledge sharing and creation since themes and areas of discussion can be predefined and shaped through more dominant actors (see Section 2.2). More powerful actors can include food businesses with large financial funds that control and influence parts of the global food supply chain.

Both collaborative platforms investigated in this research have powerful actors such as Nestlé, Unilever and Coca Cola in their membership. This research has shown that the PSF and SCP Roundtable represent two different configurations of internal power

distribution. In the interviews with some members, the PSF was characterised as a very equal and democratic collaboration where each member is treated and regarded uniformly. WRAP was perceived as essential in this regard as the organisation acted as a 'ringmaster' who controlled processes and made sure that a balance was kept within the PSF. In an interview with a WRAP official it was stated that a power imbalance never occurred within the PSF and all actors contributed to the collaboration by maintaining mutual respect, regardless of the members' financial or political power. A key strategy of WRAP is to create a comfortable work environment for the members that benefits collaborative and balanced working. According to a leading WRAP official:

> *"the initial workshops are quite structured, but they are also quite informal and free flowing. So we say just things like […] don't come in a suit and tie, this is a working meeting, come in clothes you are comfortable in. What we are trying to do there is to provide an environment which is informal, which is about partnerships, which is about collaboration. So there is an expectation from the start that this is something, where people come into a room, they gonna (sic) roll up their sleeves, they gonna (sic) look at the issues, they gonna (sic) collectively find solutions to those issues and they gonna (sic) agree to a list of actions on how to find solutions and how to test them" (3C).*

For some PSF members a strong voice within the collaboration tends to be linked to individuals and their skills and authority, rather than the size of their company or institution. The structure within the PSF allowed individuals to come forward and contribute with more strength to certain themes based on their knowledge and expertise. In return, for many members the operation and work on an individual level benefited the overall trust within the collaboration.

Interviews with members of the SCP Roundtable reveal that, compared to the PSF, it has more of an imbalance of power between the members. Particularly certain food and drink producers were perceived by some members as dominant members in the SCP Roundtable. According to a member who has been participating within the PSF and the SCP Roundtable, there is an open recognition amongst the SCP Roundtable members of this power imbalance. For this interviewee:

> *"When you start looking at the SCP roundtable, there is one very big company who has been very dominant in that debate and it is a real contrast to the PSF in terms how actors are involved. So I was doing the PSF and the SCP roundtable at the same time and I was*

> *really taken back by the contrast between the two in that with the roundtable work it was more dominated [by] certain large companies and it was dominated by certain individuals and it was dominated [by] really quite divisive approaches and views, as well"* (7IU).

According to food experts and some SCP Roundtable members, this power imbalance was created through an internal power vacuum. This aspect can be illustrated through a comparison between the PSF and the SCP Roundtable. According to the interviewee who participated in both platforms (7IU), the power vacuum within the PSF never existed as WRAP acted as an independent broker and 'ringmaster'. This independent actor never existed within the SCP Roundtable and thus a power vacuum occurred, which was filled by certain companies and benefitted through the lack of ability of other members.

This power imbalance within the SCP Roundtable appears to be recognised by members of the platform and they discussed it openly in the interviews. For a member of the SCP Roundtable:

> "*if they [dominating actors] consider it to be useful to walk into a certain direction then I'm willing to help them if I think that is a good direction that I would like to go to, or I warn them if I think my particular business then would be under threat, but I would never say 'we should go this way or that way*' (2IE).

According to interviewed members, this acceptance of power imbalance within the SCP Roundtable relies to some degree on the expertise and real-world resources of the dominating member. Resources such as number of employees, physical workspaces or embeddedness in international networks can allow members to be better informed and thus, contribute more to the collaborative platforms. According to a food expert of the EC who used to be involved in the SCP Roundtable "*it is a question of resources and this is why you have to, when you set up these groups be very conscious of this and you have to be very certain as a chair person that this balance doesn't get out of hand […]*" (1GE).

In relation to power imbalance within both collaborative platforms, shadow agendas were mentioned as an issue by a number of interviewees. A shadow agenda in this context refers to the situation where members of a collaboration seek to achieve

individual goals and therefore have an agenda which they try to infiltrate into the collaboration's agenda. According to an expert of a food and drink manufacturer, more powerful actors within collaborative platforms "[…] *have more ability to bring the evidence but larger players also have the ability to shape the agenda to their particular special advantage*" (7IU).

The issue of shadow agendas was according some interviewees distinct within the SCP Roundtable. According to an SCP Roundtable member, for the operation of the platform it is critical to be aware that:

> "*you have the one [member] which are proactive on things to move, but which are too small to make things move in the round. So they need [a] broader coalition to make progress with their ideas. You have organisations which are here to get some information and stay there without providing too much input. The third type is the one which are there to block. To make sure that things don't progress too fast*" (3IE).

In order to counteract such internal tensions of multiple shadow agendas, the members of the SCP Roundtable see it essential to have a clearly defined mandate at the beginning of tasks and projects. According to SCP Roundtable officials this particularly ensures clear borders and rules under which the members work and thus, contribute towards a common goal.

A different perspective on shadow agendas was expressed by a food and drink manufacturer. This interviewee believed that the potential reason for the development of shadow agendas might be an underlying process of finding common ground within a multi-stakeholder environment. This was particularly the case regarding complex and diverse topics where varied interests are inevitable:

> "*So someone who is agro-business and [is] looking at sustainability issues on base of a supply chain has both the branded interest of getting it right and also a long term continuity potentially or quality of supply reason for getting it right. So they may well frame their position in a way that more significantly support their own driving reasons for being involved. Whereas a retailer, because it does not have the same agro-supply requirement, because it's buying second party or third party to a supply chain, may have a brand reason but not the same continuity of supply reason. You know both have brand reason but there are also other actors that are also part of this. For example, the major consolidators and processors, who don't have a visible consumer brand reason, but do have a continuity reason*" (5C).

Members of the PSF are also aware of this potential danger concerning shadow agendas within their collaborative work. According to several PSF members, the environment within the collaboration is characterised through a high level of mutual respect among members and an authentic belief in the overall goal. Particularly more powerful members such as food and drink manufacturers, are believed to work collaboratively with other non-industry members towards the collective goals. Members of the PSF also mentioned that individual interests of members were often made transparent. Instead of a secretive shadow agenda, individual interests of members were brought forward and openly discussed in the platform. According to a PSF official, the transparency in a collaboration is a linked to the voluntary operation of a platform. For this interviewee:

> "… industry volunteers to be honest, so if they have absolutely no interest in doing anything that will improve the sustainability of their products and they joined the PSF then they are clearly in the wrong room. So you know they won't come if they don't care. So you tend to find there are people in the room who actually, you know they sign up to the goal and they recognise that what we are doing will help them in the long run and probably in the short run, too. The goals are broad and they are high level and they are going to cover a big range of products and it may not the be the products they are most interested in for 6 or 12 months, but that's part of the deal. I think there is an established kind of way of working and people respect that. The reason the industry likes the voluntary action is because they can influence so they are in the room …" (3GU).

NGOs can play a special role within collaborative groups regarding internal power relationships. According to some members of both investigated collaborative platforms, NGOs are valuable partners within a collective due to their positive image within wider society. Particularly for industry led collaborations, can be valuable members that function as a legitimacy tool. According to some food and drink manufacturers interviewed it is regarded as challenging to convince and influence policy makers or consumers if there is a lack of support from NGOs. This aspect became evident when the NGO World Wide Fund for Nature (WWF) departed from the SCP Roundtable. According to a founding member of the SCP Roundtable:

> "*…the WWF lost the feeling that the Roundtable really want to achieve something and they saw it more as a 'blabla' exercise and I think food roundtable members failed to really facilitate powerful relation with the WWF. But it's a pity, because it weakens whatever we say. Industry can say a lot, but if neither the Commission or an NGO is supporting that, too it's pretty worthless and we can do that in our own sectors as well*" (2IE).

According to an NGO representative, NGOs are aware of their desired position within collaborative platforms and thus, are cautious about their involvement. This aspect can especially be illustrated through the following statement of an NGO representative:

> "*So for us if they [industry actors] decide to shape the agenda and it is done in a good and positive way we are ok with that but [if] it's greenwashing then it is more problematic for us. That's why it is important to give open exchange and give them feedback. […] [At the same time,] if you are in the platform you are somehow passively agreeing on the whole thing, while when you are out you can very well say loud and strong that this scheme is greenwashing tool and it should be better targeted or designed*" (1C).

On the one side, NGOs are open to collaborate with other actors from industry and support their agenda, if that agenda is regarded as conforming with the values of the NGO. On the other side, NGOs are in fear of indirectly being seen to agree with industry interests by being part of an industry led collaboration.

Overall, this section has demonstrated that agenda setting and power distribution are key issues within the PSF and SCP Roundtable. This would have been difficult to grasp from published material of the two collaborations.

4.2.2 Formal vs. informal forums

The two collaborative platforms PSF and SCP Roundtable both operate through a variety of physical and virtual forums. Forums can be described as a space in which individuals meet and come together. Based on the analysis of publications from both collaborative platforms, it appears that most member gatherings have a formal character. At the same time, the interview findings have shown that member gatherings were mainly described as meetings, presentations or workshops. The interviews also showed that there are different opinions about the effectiveness in relation to their ability to facilitate collaborative learning. A contrast was drawn by the interviewees between the formal and informal character and setup of a forum. These research findings have led the researcher to select and elaborate on the theme 'formal versus informal forums'.

A formal gathering of members was predominantly described as an environment with clear and strict rules, objectives, timetable, dress code and agenda order. A more informal gathering was referred to an environment where discussions and gatherings are not tied to a specific time schedule, with agendas regarded as flexible and adaptable and members attend in casual dress code. Interviewees, who were in favour of formal forums felt it facilitated transparency in the collaboration. For a member of the SCP Roundtable, formal forums were valued for providing a focused and efficient environment in engaging members, which can deliver clear and tangible outcomes. This member points out that:

> *"It [SCP Roundtable meetings] needs to be very well structured with clear terms of reference, clear objectives, clear mandates and clear deliverables in the mandates. […] We have defined terms and reference of the roundtable with what is the objective, what we want to achieve and so on; how this will be governed and we took the decision that every entity within the roundtable from the plenary assemble to the steering committee and the various working groups would be all co-chaired by the European Commission and one representative of the food chain and that there will be equal representation within the steering committee of every category along the value chain so with agriculture, industry, retail and so on" (1IE) .*

Not only is a formal setup perceived to foster equality, but is also seen by this SCP Roundtable as essential for trust building within a multi-stakeholder collaboration:

> *"For me I believe that we have to have clear rules approved and transparency. So no games behind the door where I tell you this and I tell something else to someone else. Because we then create no trust and if you want to build something together you need to have trust. If there is no trust, you don't progress"* (1IE).

According to an employee of the EC, collaborations can no longer be entirely informal due to the increased importance of transparency and compliance to rules and regulations. The interviewee claimed that contact with stakeholders was easier in the past, as they are now obliged "*to put all these meetings into the official system, which [The EC] have to bring after the meeting back to office reports*" (1GE). Informal meetings between stakeholders become rare and transformed towards more private, non-work related meetings.

The majority of interviewees from both collaborative platforms indicated that they do see the need for formality within meetings or workshops but are also in favour of more informal formats. On multiple occasions members said that they had had positive experience when combining informal and formal formats. A mixed format was particularly seen as beneficial in providing an environment that allows members to gain an understanding about formal and more intangible forms of knowledge. A former policy maker that has been involved in the PSF explained his preference for combined formats in this way:

> *"I would make a mix and mix social coming together with formal time is a critical part of it. We would always have a social part of any meeting there will be drinks afterwards or dinner or lunch or something, because you build the chemistry between people, as well as establish those content exchanges. In the end why people will collaborate particularly in controversial areas where there is strong divergent opinion is because they got to know other people well enough to trust them. You can't build trust just through meeting structures, you have to build trust through the informal, convivial aspect of collaboration, as well as through the formal meeting style" (2C).*

For many interviewees the formal element does not necessarily get lost through the use of more informal practices in gatherings. As according to an EC representative:

> "*you have to make two distinctions here. One is formal and informal context, which means a coffee on the side or a talking in the street and that after work beer. Or you have a formal meeting but in an informal setting and that, I think we should be much more doing this"* (1GE).

According to a number of interviewed platform members, a collaborative learning and knowledge sharing is enhanced by more informal formats that are embedded into a broader formal format of meetings and workshops. The formal formats are regarded as useful in facilitating a clear structure for discussions on a specific and clearly defined topic. This stands in comparison to more informal setups that were perceived as very useful for learning and knowledge sharing. Particularly social interactions around the consumption of food and drinks are regarded as particularly important:

> *"a very good for sharing an idea and getting ideas across and you know the coffee break afterwards is where it really happens. So if you get a powerful presentation of whatever the topic is to a wide audience of invites then you can have that buzz in the lunch or coffee room because people are talking about ideas and that's where you see the policy maker talking to the industry rep […] that's where that dialogue happens" (6IU).*

4.2.3 The role of competitiveness and trust in knowledge sharing and learning

The theme of competitiveness and trust in collaborative learning and knowledge sharing was selected based on both existing literature that explicitly points out the important role competitiveness has within collaborative learning environments (see Section 2.1.6) and the views expressed by some interviewees. The competitiveness and trust theme were also selected by the researcher as the majority of interviewees had strong opinions about competition and its impact on collaborative activities.

The interviews identified that the presence of competing actors can create an environment with a competitive or pre-competitive character. This competitive environment can be described as a situation where competing members such as food businesses, are cautious about sharing knowledge that might give their competitors an advantage. This was also demonstrated in this statement from an SCP Roundtable member:

> *"As far as I see I think there is competitiveness and we in my industry we are in competition with [food industry segment] manufacturers. So there is definitely some tension. We are following carefully, because we don't want the food roundtable to come up [with] things that make our life difficult or make our life in particular more difficult than life of the neighbour industry. I don't really know how the other sectors or the other constituencies see that. I think it's mainly to watch carefully what might harm you later that's the overall attitude at the roundtable" (2IE).*

The official stance of the PSF and the SCP Roundtable is that they operate within a pre-competitive environment (see Section 3.3). This pre-competitiveness relates to the sharing of knowledge that is not linked to any business secrets. Most of the interviewees were aware of potential areas that might fall into a competitive area and in some cases members think that *"[…] there is no such thing as pre-competitive collaboration because in theory everything anything could be seen as having an impact on competition*" (6C). There is a consensus within both of the collaborative platforms that certain areas related to food sustainability, such as health or safety, are areas that do not relate to sensitive business activities. Members of both platforms have generally a positive approach towards the collaboration and had the opinion that competitiveness has overcome the

benefits derived from collaborative knowledge sharing that might lead to a business advantage.

It was noted by several members of both platforms that even certain themes that would usually be considered as strong business related shifted during the work of the collaboration towards the pool of topics that are discussed more openly. The thinking of members behind this is that certain business aspects are also related to the sustainability of the food system and thus, are recognised by stakeholders as pre-competitive or even non-competitive areas. This applies particularly to raw materials and resources, such as water or palm oil, which have similar procurement costs for food manufacturers and are inevitably connected to a common natural system. According to several interviewees a competitive and non-collaborative mind-set regarding the sourcing and processing of such commodities can be disadvantageous for all actors in the food system. A former sustainability manager of a food and drink manufacturer expressed this point dramatically as *"if one company in a water shed does not share ways to save water and they are competing for water with limited supply, then they are all going to fail"* (4IE).

Members of the PSF stressed the positive and trustworthy environment within their collaborative platform, which has strengthened open dialogue and prevented competitive thinking. According to a PSF member the absence of competitiveness opens the opportunity for members to learn about the perspectives and values of actors they would usually not communicate with such openness. For this member:

> "*people use things like pre-collaborative and competitiveness, but they [PSF] created very much of a safe space where you could have both in the formal meetings, and the way it works that you have lots of breakout sessions where you can get together in groups and discuss things. So what I'm saying is that they created a very open and integrative things and it was really useful because in that environment you can get an understanding and sense where the different players are coming from, where their priorities are and how much they are willing to share. I mean at the end of the day you have a big bunch of retailers and manufacturers and their competitiveness. That was however off played by, I think the understanding from all the different players that [the] kind of issues and the scale of issues we are trying to tackle are beyond of anyone of them"* (7IU).

According to a number of interviewees, this aspect of the PSF is fostered through the high level of competency of WRAP as a neutral facilitator and guarantor, as well as the openness of many competing actors. The transparency of many food businesses was considered as initially surprising by many members and had an accelerating effect that led more members to open up. Many members of the PSF correlate this openness and transparency of businesses to a wider business trend regarding Cooperate Social Responsibility (CSR). According to some PSF and SCP Roundtable members it is therefore an act of self-interest by companies to have a positive and open-minded approach within collaborative platforms. A PSF member stated in relation to this:

> "*Sometimes I have been overly surprised when I have heard companies talking about 'oh we are doing this and we are doing that' and if I was their competitor I would think, 'I need to be doing that'. I think it's interesting and I think there are two tensions here. One is a lot of these companies do generally this as a wider issue and not just as an individual company issue and it ties in with their wider CSR agenda, about openness, about collaboration with their suppliers and I suppose something more like a commander control price driven, I mean you know money hanging largely behind these things*" (7IU).

This element of CSR and knowledge exchange on supply chains was mentioned by several members of both platforms. For some members it is an environment in which knowledge is shared between members regardless of its business value. According to a food and drink manufacturer:

> *"if [Company A], [Company B], and [Company C], say 'actually we source from that farmer how can we work together to help that farmer'. That's what I understand as pre-competitive space. It doesn't affect the commercial relationship they have with the farmer but it affects the agronomy that the farmer goes through. So yes you sit in a room with [Company A], and [Company B], have a cup of coffee and talk about how best to grow oranges in Brazil and they will be very open about that with each other. [But] What the processing costs and how they brand it; clearly you won't be talking because you are crossing over to competitive territory" (6IU).*

The aspect of wider CSR and the connection to financial business interests for food and drink manufacturers has been illustrated through shared auditing activities. Particularly food and drink manufacturers have raised the importance of collaboration in the field of strategic supply chain activities. Even regarding strong competitors:

"There is another one called AIM progress that looks more at the ethical dimension and social dimension. Sitting in a room with [Company A], and [Company B], and [Company C], who openly hate each other in a trading environment collaborate on how can we share our audits of factories in Thailand because if we don't share, then we are paying for an audit that cost all of us more money, it costs the supplier more money because you need more down time when he is audited that affects us all" (6IU).

Despite the positive and transparent perception amongst the majority of PSF members, the competitiveness element within the PSF was also recognised and appears to be not completely absent. According to a PSF member and food retailer:

"There is definitely competitiveness, but they do realise that the competition only starts at the supermarket shelf and the challenge we are facing at the moment in our platform and with our objectives have to do with agriculture and for our members sustainable sourcing is key" (3IU).

The research findings showed the overall conception among the members of both collaborative platforms was that actors who join a voluntary collaborative platform participate predominantly with an open and non-competitive mind-set. According to the majority of interviewees it is believed that actors who are interested in learning from other actors and who invest time and resources in a collaborative platform have a self-interest in sharing their own ideas and experience. Members of both collaborations were aware of potential competitive tensions but perceived those as being of secondary importance compared the benefits that arise from collaborating and sharing knowledge.

4.2.4 Collaborative joint activities

The research findings from the interviews and document analysis indicated that the theme of collaborative joint activities is critical to understand collaborative learning and knowledge sharing in the food system. The documents from both platforms feature a series of collaboratively conduced case studies that aimed to enhance knowledge on food sustainability. This theme of collaborative joint activities was also selected by the researcher as numerous interviewees have pointed out the importance of knowledge creation through practical experiences, including collaborative case studies.

A key element of both collaborative platforms is not only the sharing of knowledge through meetings, but also on a pragmatic level concerning collaborative work on specific projects. According to the literature on motives (see Section 2.1.3) the motive behind such collective actions is to conduct projects that would be too difficult to manage for single members, or require the expertise of multiple members. Through the process of scaling up resources, dividing work and costs, collaborative platforms are able to develop, manage and operate activities on a larger and more complex scale. According to members of the PSF and SCP Roundtable, very specific projects (see Table 4.2) are particularly regarded as highly beneficial in learning through a pragmatic and 'hands-on' approach.

Table 4.2 Examples of joint projects

Project name	Description
PSF's Pathfinder Project on potatoes	A multi-stakeholder approach to analyse and understand the value chain of potatoes from an agro-industrial perspective. The key aspect is to identify key areas within the value chain that are critical for sustainable development.
SCP Roundtable's application of their environmental assessment methodology on a global scale through large food and drink manufacturers	Membership of large food and drink manufacturers can enable the SCP Roundtable to create a harmonised methodology in assessing environmental sustainability. This can potentially avoid conflict and misunderstanding amongst stakeholders in the food industry, as ideally other actors would adapt to those assessment standards.

Source: Author's own table

These joint projects were considered as smaller side projects for each member with a proportionally small contribution of their own resources. Members from both collaborative platforms that have been participating in collaborative projects expressed their curiosity and interest, but also explained that from an individual member perspective it is regarded as an 'experimental laboratory'. They also mentioned that the failure of a joint project would not lead to negative implications on the members' core business.

The interviews also showed that the level of involvement and motivation towards joint projects was often dependent on the personal preferences of individuals and their interest in certain activities. These personal preferences are however still aligned and operated within the boundaries of the organisation they represent. According to a governmental representative, "*food businesses have often individuals who are passionate about these [joint activities] things and totally genuine in what they are saying in what they want to do. But that's because they are employed to take that stance for the business*" (4C). The learning mechanism that was mentioned by some members was often referred to as 'learning by doing', which includes the development of improvements and the recognition of mistakes or failure.

According to some PSF and SCP Roundtable members, such ways of learning cannot be facilitated through other activities, such as meetings or workshops. The Members of both collaborations also mentioned that being in a real-world scenario forced them to deal with real-world problems, and stressed that this is different from theoretical learning. These members conclude that this can help to confront members of a collaborative group with an unusual and creative learning approach.

Co-creations are regarded by many interviewees of both collaborative platforms as the most efficient way to learn from each other and create new knowledge. On a pragmatic level, collective learning and knowledge creation through joint activities are not necessarily based on the concept that all members contribute equally and with the same intensity. According to a former sustainability manager at a UK grocery retail chain:

> "*…you are sharing in the generation of the strategy or solutions. That doesn't need to say that everything is run by everybody. There clearly have to be some organisational structure with it that says, if there are 30 people collaborating, you can't have necessarily 30 people making a decision. So you have to have a structure to the decision making process. But there has to be abilities that people are contributing to the level that they feel is necessary given their stake in the game. I think there has to be regular dialogue, but not to the extent that it feels like a talking show without any outcomes"* (5C).

In relation to learning and knowledge transfer, a key element of these joint projects is the ability to involve other members in the collaborative learning process. The individuals within the collaborative platform often come from different professional backgrounds. According to members of both collaborations, this was regarded as a positive feature of the platform, but on the other hand some members regard this diversity as a potential barrier for collective learning and knowledge transfer. According to a PSF member, individuals within the collaboration might have communication difficulties but at the same time they all work towards the same goal. This member stated that:

> *"they [PSF members] don't really speak the same language actually. I mean you just have to accept that that you will have different groups within the room. At the of the day they might not like each other they might not agree with each other and they might just have something small in common but they might well not. The good things about the PSF is that the word sustainability tells you that they all have something in common, they all care about sustainability or they wouldn't be there" (3GU).*

A critical element within collaborative platforms in the food system and the operation of joint collaborative activities appears to be the management of the multi-stakeholder environment. A PSF member and large chain grocery representative stated in relation to food related collaborative platforms that:

> *"The biggest task is to manage diversity. To create some kind of container that can hold this diversity. One the business type of culture on the other the NGO/ civil society type of culture but also inside different stakeholder groups you have differences. So not all NGOs have the same type of approach and the same understanding and same language and likewise in the business community. There is a huge difference between the way companies like Nestlé is operating as compared to a company like Innocent or company like Unilever" (3IU).*

Other members noted however that the potential barrier in learning and knowledge transfer within joint projects is linked to the heterogeneity of the goals within the overall

goal of fostering food sustainability. According to a PSF member and grocery chain representative:

> *"It is not very easy at all. So each of the retailers will have their own perspective or priorities. The processors will tend to align with whoever their major customer priority should be. The NGO's tend to have a very singular focus which is their issue and this can be a challenge to us. You might have an NGO worried about human social development or animal welfare or insect life and I have to find something and I can't achieve significant improvements on every single thing and I have to prioritise and deal with the issue to compromise with the priorities" (2IU).*

Differences in understanding the working areas and aspects within collaborative projects can according to some members harm the relationship amongst the members. This in turn can create greater disadvantages in relation to collaborative learning and knowledge transfer. A PSF member stated that *"you do have to be careful about language because people say words that will upset other people" (3GU).* This interviewee explained how, for example, the word monoculture might have different meanings to different members.

A different perspective was expressed by a former sustainability manager of a food and drink manufacturer. From this interviewee's experience, joint activities within collaborative platforms tend to be more pragmatic regarding communicating each other's knowledge and thought processes. In this regard, the former food industry manager stressed that:

> "*So public affairs talk to public affairs no problem. I think when you have these collaborative initiatives you have got people of the same level talking to each other and the leaders, the CEO will be there for the handshake to set up the initiative. But people who are actually going to do the work have similar issues, similar training they are in the similar industry and they are very easy to talk the same language*" *(4IE).*

The research findings also revealed that for some members collaborative projects often fail or do not deliver the anticipated results due to the differences within the collective. According to a former food industry manager, collaborative multi-stakeholder platforms in the food system, such as the PSF and the SCP Roundtable, are slowed down in their collaborative activities by the decision-making process of each individual member. This issue was raised in relation to decision making processes of companies and NGOs that

work on a collective project. Companies often have very hierarchical decision-making processes and individuals that work on joint projects tend to have a high level of delegated decision-making power. On the opposite, the former sustainability manager claimed that NGOs often tend to have a very democratic hierarchy and thus, have a more complex decision-making process that involves consultation and takes more time. This situation can slow down the development of a joint project and limit the collective learning and knowledge sharing process.

Knowledge sharing and creation through joint activities is inevitably linked to specific types of knowledge that are perceived as relevant by members. These types of knowledge and their link to joint activities are outlined in Section 4.3.2.

4.2.5 The role of a knowledge-hub and neutral actors

This section focuses on the findings that relate to the role of WRAP, the EC and external experts in relation to learning and knowledge transfer within the PSF and the SCP Roundtable. The issue of knowledge-hub and neutral actors was identified as a theme throughout the interviews. Members of both collaborative platforms stated directly or indirectly, through storytelling, the importance of a neutral actor and facilitator within the collaborations.

Members of both collaborative platforms pointed out their dependence on the two neutral actors, the EC and WRAP. Neutral actors were described by many interviewees as an authority who keeps the balance, provides expertise, and guides and supports collaborative activities. WRAP was generally perceived by the interviewees as a good neutral actor that enhanced collaborative learning and knowledge sharing. In contrary, the EC was perceived by the SCP Roundtable members as less neutral, with strong self-interest.

A further reason for identifying the knowledge-hub and neutral actors as a key theme was based on the analysis of documents published by the two case studies. The SCP Roundtable's webpage and published material on the platform's structure portrays the

EC as a co-chair that is not attached or affiliated with any other member. Similarly, WRAP is portrayed by the PSF as an actor that is in charge of the administrative and organisational tasks of the collaboration. Even though the EC and WRAP appear to be similar in their role within their respective collaborative platforms, the interviews showed that members perceive those two actors differently.

Many PSF members pointed out the importance of WRAP as a neutral facilitator and knowledge-hub. The role of a knowledge-hub includes on the one side the translation of complex and technical knowledge into more usable knowledge that is more accessible to most actors within the collective. The members of both collaborations consist of actors that are specialised in different segments of the food chain and at a different scale. According to a PSF member, potential communication problems within such a diverse membership were encountered by the competency of WRAP and this hampered the efficiency of collaborative learning and knowledge transfer. In relation to this, this interviewee stated that:

> *"key to all of this was the role of WRAP and particularly the approach that the people at WRAP did; WRAP was government funded, but it was very much and still is a very highly respected independent broker, bringer of expertise, high level of integrity with them. What really mattered here was that they were the convenor of all the different supply chain players" (7IU).*

On the other side, the knowledge-hub acts as a 'knowledge vault' that provides insurance for the members to keep sensitive knowledge coded before is shared among the members. According to a food industry PSF member:

> "*[what] WRAP has done successfully is the act of information and the privilege information, the commercial confidentiality. WRAP has already proved that they could through the Courtauld arrangement be given confidential information they could hold it, they would turn it into more generalized information which was then more relevant for other companies and technically reveal who the source was who the company was and therefore give a competitor an advantage. That was very important I think if that had not already been to some extended cracked, it would not have got off the ground. But they had the systems and this is what made it easier you know because you immediately had confidence from the commercial side and that is absolutely critical*" (3GU).

The EC was perceived by some members of the SCP Roundtable as an actor with clear self-interests within the collaboration. For a former SCP Roundtable member this

resulted in an environment where members tended to be for or against the EC's suggested approach. According to this interviewee "*the Commission got into this and clearly said this is about what we need to get in and some had to think and go and cooperate with that or others like us said 'no we need to fight this' …*" (7IU).

The interviews showed that the special relationship between the EC and the SCP Roundtable members is not neutral or balanced. The work of the collaborative platform focuses on issues that relate to the policy agenda of the EC. This connection was seen by a SCP Roundtable member as unproductive. According to the interviewee:

> "*…the food roundtable is a policy response, we always try to do something that otherwise could be potentially done by the Commission and that's interesting to see because there are many people in Brussels paid to be in Brussels who navigate the Food Roundtable to Brussels policy. I'm simply interested [in] how that goes but at the moment it's really a very unproductive setting*" (2IE).

A key strategy of the SCP Roundtable is to promote the ideas and concepts of the collaborative platform to the EU policy agenda. This is mainly done by making use of having the EC as part of the collaborative infrastructure. According to an SCP Roundtable member, to have an impact on the EU policy level and to promote the concepts of the SCP Roundtable, "*the basic strategy is to have the Commission as the direct Co-Chair of the roundtable*" (3IE). Compared to WRAP, the EC is a more political actor that on the one hand acts with self-interests and on the other hand is perceived by the SCP Roundtable members as a key channel to exercise political influence within EU policy. This critical role of the EC is particularly evident, as according to an SCP Roundtable member, "*if the Commission jumps off as [the interviewee] heard recently, [the interviewee] think[s] that there will be nobody listening [to] what comes out of it [the SCP Roundtable]" (2IE).*

The third group of actors that appears to be neutral within each collaborative platform are external experts that are occasionally invited to join the collaboration. Such non-members are usually specialised in specific areas and highly respected for their expertise. Seeking the assistance and expertise of external experts can be of high interest for collaborations since the complexity of specific topics in the field of food

sustainability can exceed the repertoire of the collaboration. According to a former senior policy advisor at Defra:

> *"there are some people that know more than we do and it's really important that we get alongside and find out what they know because we need to know it, too. They know more because they are better scientists or may have this lay knowledge or may be practitioners in this field and they know on the ground what works and what doesn't. So we really need to get alongside them to understand what they are engaged with; knowledge that we don't have, unless we get out there amongst them" (4GU).*

The rules and procedure regarding the contribution and the temporary integration of such experts into the collaboration is not evident from the documents produced by the two platforms. Within the PSF and the SCP Roundtable it appears that external experts are predominantly invited to meetings and other activities through flexible approval of members. These flexible rules however need to be in accordance with the collaboration's 'unspoken' rules. According to an SCP Roundtable member "*[…] you may have also external participants as long as they are approved by one of the members joining the meetings …*" (1IE).

4.2.6 The role of digital online platforms in knowledge sharing and learning

The theme on digital and online platforms in collaborative knowledge sharing and learning was selected by the researcher because many interviewees from both collaborations pointed out the importance of such learning environments. In addition, the critical role of digital and online platforms for collaborative learning and knowledge sharing appears evident through the fact that both collaborations embedded such virtual online platforms as part of their collaborative structure and activities. This aspect is demonstrated particularly well through the PSF Knowledge Base. The PSF defines its 'Knowledge Base' as

> "*…a collaborative space for those organisations interested in working together to quantify, communicate and reduce the life cycle environmental impacts of grocery products. It is also increasingly being used by industry and others to share new evidence, learning and best practice, including that derived from the PSF's Pathfinder demonstration projects*" (WRAP 2016a).

The utilisation of the internet appears to be important for both collaborative platforms since they use their online appearance for communicating their collaborative structure, membership, aims and achievements. The PSF and the SCP Roundtable have a section within their webpages where visitors can freely download documents that relate to the collaboration's work and positions within the food sustainability arena. Both collaborative platforms offer an online communication channel through email for interested stakeholders that want to get in touch with the collaboration. The SCP Roundtable and PSF webpage also feature a 'members only' area which enables members of the respective platform to exchange ideas and review digital documents that might contain sensitive content or are in a draft stage.

The popularity of such online platforms is according to a number of interviewees the result of an expanding era of digitalisation, which in turn impacts the way humans interact and communicate with each other. Several members of both collaborative platforms pointed out the importance of online communication tools, such as emails, webinars or video-chat. According to a former SCP Roundtable member, collaborative platforms have to be embedded into the online world in order to be efficient and to manage the workload. This aspect was perceived by interviewee as a key element of the food system's development towards the so-called Industry 4.0. 'IDUSTRIE 4.0' or 'Smart Industry' refers to a technological evolution and:

> "*represents a paradigm shift from "centralized" to "decentralized" production – made possible by technological advances which constitute a reversal of conventional production process logic […]. INDUSTRIE 4.0 connects embedded system production technologies and smart production processes to pave the way to a new technological age which will radically transform industry and production value chains and business models* (Germany Trade and Invest 2014, p.6).

This aspect of rapid technology development in the food system is according to a number of PSF and SCP members key in relation to knowledge creation and transfer within complex areas, such as food sustainability. According to a PSF founding member, development in digital technologies represents a challenge for stakeholders in the food system as there is a knowledge gap. This interviewee stated in relation to that:

> *"We have right now whether you talk to manufacturers or retailers or farmers, we have very little knowledge on [how] to fill these skills gaps that exist now. When I think about things like this massive explosion of technology in the next years and what that means for the skills profile of people working in the food industry that is a direct play into food knowledge and it makes me very nervous. Because if we don't have these skills and knowledge in the food chain, we will not maximise the benefits of these data enabled technologies. So, our ability to understand, manipulate, convert that data into information, knowledge and wisdom is going to be critical" (3C).*

The work on multidisciplinary topics such as food sustainability entails the management and analysis of a large amount of content. According to an EC official on collaborative work in the food system:

> *"…meetings are one thing but in the digital age that we live in now this is not good enough. I think all of these platforms should per definition also exist in the digital world with virtual collaborative space and open data portals or something, where people apart from the physical meetings can exchange and can chat and discuss"* (1GE).

Even though the use of online communication platforms and channels were generally regarded as a positive element for the majority of members from both collaborative platforms, some members also expressed concerns. Particularly regarding learning and knowledge transfer, the online environment can be a disadvantage due to the lack of face to face interactions between members. According to a WRAP consultant and key architect of the PSF:

> *"…80% of a person's communication is non-verbal. Someone's stance, it's their tone and voice, it's their body language. All those kind of things, you cannot see that on a webinar or on a phone call, but you can see that when you are in a room with someone, you can see when they are getting uncomfortable, you can see when they get excited, and you can see when an idea just hits. Whereas you can't do that where you got that literate email …"* (3C).

Most interviewees from both platforms underlined the importance of face to face communication for efficient exchange of ideas and to learn from each other. The utilisation of online platforms and communication tools was regarded positive amongst members. The online work was however mainly thought of as an 'add-on' to the offline face to face interactions. This element can be illustrated by the time when the EC attended an SCP Roundtable meeting only via video chat, which was negatively regarded by some members. According to an SCP Roundtable member, *"… we [The SCP*

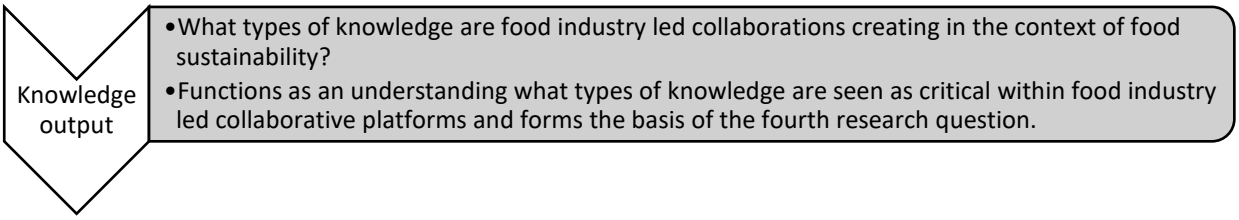
Roundtable] have some difficulties and maybe you recalled that from the meeting that [the] co-chair actually was not in the room it was by video link …" (3IE).

4.3 RQ3: Types of collaborative knowledge in food sustainability

RQ3: What types of collaborative knowledge are valued by actors that participate in food sustainability?

This section discusses the research findings that relate to the types of knowledge that are created and valued by the two collaborative platforms PSF and SCP Roundtable in the context of food sustainability. Thus, the research findings that are outlined in this section relate to the third research question and concern knowledge output (see Figure 4.3).

Figure 4.3 Logical structure of the research questions: Knowledge output



Source: Author

Section 4.2 above illustrated the collaborative approach to learning and knowledge exchange by the two investigated collaborative platforms. The content and types of knowledge that have been exchanged and created through these collaborative activities are featured in this section. The importance can particularly be illustrated through the following statement from a former senior policy maker:

> *"I'm also worried that some of the knowledge in the food and health section is generated by industries, by very interested parties. It's difficult to avoid this as the public sector has shrank so much and you have to acknowledge where you can. But you need to be extremely careful about knowledge that is generated by industry parties. This is why I go on and on always so to keep a strong amount of public policy research in food policy or anywhere else, so you can query what the manufacturers are telling you"* (4GU).

The majority of interviewees from both collaborative platforms had predominantly a positivist understanding of knowledge. Interviewed members mainly referred to knowledge as something tangible, quantifiable and knowledge was assumed to be universal. Similarly, knowledge that was featured on the webpages of the PSF and the SCP Roundtable had predominantly a positivist perspective on knowledge. According to

a PSF member *"it [the PSF] gives you that real evidence based, knowledge-based understanding that comes from that collaborative process, everybody bought into it"* (7IU). In addition, this positivist concept of knowledge can be illustrated by the statement of an SCP Roundtable member, who stressed that:

> *"We [the SCP Roundtable] worked a lot with data and information knowledge. So first you have data and then you transfer it to information that you can use and that in turn creates knowledge and we worked a lot with this model" (1GE).*

Even though both collaborative platforms have some level of homogeneity in their membership and the majority had a clear positivist, tangible and countable understanding of knowledge. When interviewees where asked about what type of knowledge they regard as critical in the context of food sustainability, topics covered a variety such as climate change, consumer rights, water usage, sustainable diets and technological innovations. A food and drink industry expert stated in relation to this:

> *"what you need is that you have consumer groups, you have government, manufacturers, producers, some critical NGO's you got all the relevant players there. But the big thing about going forward is that debate between sustainable diets and healthy diets and what it is we as a nation and globally eat and in the long run in terms of food security. You also have to think of innovations and particularly technical innovations" (7IU).*

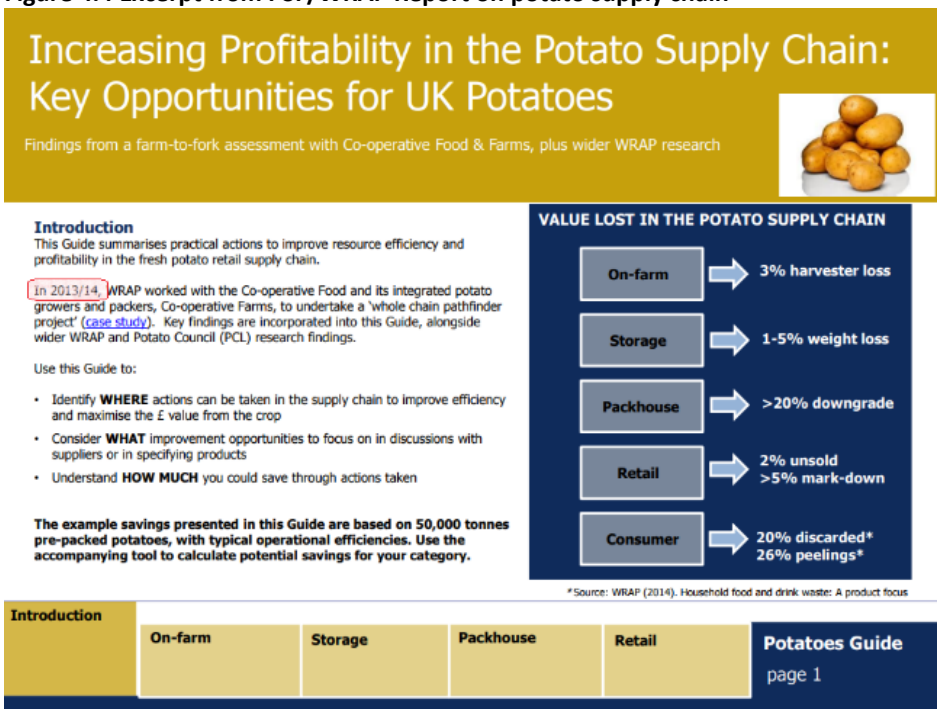
This aspect underlines the statement of some interviewees that it is critical when working on food sustainability to focus on a broad spectrum of knowledge in order to cover the complexity and diversity of the challenges within the food system. This holistic approach within collaborative platforms in the context of food sustainability also became evident when interviewees were asked about their ideal setup for a collaborative platform that aims to tackle food sustainability challenges. The majority expressed the need for a broad spectrum of actors that cover a wide range of areas and types of knowledge that relate to food sustainability. A former senior civil servant stated in relation to this:

> *"So my first tackle would be all the major food companies and I mean all. So I mean those that are very quiet and do nothing and produce rubbish, as well as the Unilever who are fantastic. I would have major foundations of which there are many with a lot of money. I would have some incredibly good people like* [X, leading facilitator within the PSF]*, so I*

> *would have some serious technical people, I would also have some very good communicators, I would have people who are passionate like me and Leonardo Di Caprio or somebody like that. So really passionate about sustainability and you need to get the movers and shakers and the celebrities, as well as the kind of technical people and the people in the supply chain and the people with the money" (1GU).*

At the same time the analysis of publications by the PSF and the SCP Roundtable reveal that the majority of knowledge appears to be created over a certain period of time and thus relates to a specific time and space. This can be seen particularly in the PSF's Pathfinder Projects (see Figure 4.4), the PSF's Hotspot data for 50 grocery products (see Figure 4.5) or the SCP Roundtable's ENVIFOOD PROTOCOL (Product Sustainability Forum 2013; The European Food SCP Roundtable 2013; WRAP 2014a). PSF Reports published in 2013 and 2014 were available to download from the PSF website during the field work of this research, which was conducted between 2016-2017. During that time the reports were presented as relevant knowledge for the understanding of food sustainability challenges.

Figure 4.4 Excerpt from PSF/WRAP Report on potato supply chain



Source: (Wrap 2014a)

Figure 4.5 Excerpt from PSF/WRAP Report on beef



Source: (Product Sustainability Forum 2013)

The PSF appears to be aware of the potential limitation of their knowledge in relation to the complexity and diversity of food value chains when it claims that *"it is important to*

note that, as every supply chain is different, the information provided should be used to guide further investigation" (Product Sustainability Forum 2013, p.1).

For some members of the PSF, knowledge creation through specific case studies can still have a wider applicability within the food system and its sustainability challenges. An example for this is the PSF's hotspot analysis as according to a food and grocery industry expert:

> "*The idea is that where these environmental hotspots are bread and you are not thinking what's the difference between a slice white loaf and a stone baked or whatever wholemeal loaf or something. I mean there are some slight differences there, but that work said that a third [environmental impact] is in the field, a third is in the manufacturing and oven, so this said that a third is in people's homes and particularly the toaster. So that again, you don't need to worry about the differences of the bread, so what it's saying here is that if we are actually planning to do something about the environmental impact on bread, we need to look at wheat varieties, fertilizers and those kind of things and on the manufacturing side we need to think what to do over efficiency and over process control and trying to reduce it and the end is maybe that we need to invent a much more efficient toaster. What it does is that it points you to these much broader, wider interactions*" (7IU)

The SCP Roundtable also explores the wider applicability and relevance of their knowledge-output through a flexible and adaptable approach. The ENVIFOOD Protocol was mentioned several times during the interview by SCP Roundtable members and is also presented on the SCP Roundtable website as a significant document in understanding food sustainability. Even though the last ENVIFOOD Protocol was updated in November 2013 at the time of writing, the SCP Roundtable refers their protocol as:

> *"…a live document. As environmental assessment methodologies and guidelines are evolving continuously, any change may be proposed directly to the Secretariat of the European Food SCP Roundtable (info@food-scp.eu) during the period of validity" (The European SCP Roundtable 2013, p.7).*

As the PSF and the SCP Roundtable focus on food sustainability, the knowledge pool of both collaborative platforms has, according to the majority of interviewed members, the aspiration to cover the complexity of food sustainability. According to a PSF member *"[…] we [the PSF] didn't just cover waste, we covered energy and storage, we covered*

packaging optimisation, we looked at product life [cycle] and how to improve that, we looked at consumer messaging" (3C). This demonstrates the high diversity of themes within food sustainability that the PSF aims to cover through their knowledge. Both the PSF and the SCP Roundtable appear to have an overall understanding of themselves as having a holistic approach towards food sustainability. According to a member, the core beliefs of the SCP Roundtable are reflected in the ENVIFOOD Protocol, which appears to be at the same time the most well-known output of the SCP Roundtable. According to an SCP Roundtable member:

> *"...the ENVIFOOD Protocol that's knowledge as a concept or methodology and a standard on how to perform life cycle assessment for food and drink products. So that's kind of knowledge I would say and scientific clearly, second more everyday knowledge or basic knowledge. I mean by this, practical things that are closer to reality" (1IE).*

4.3.1 The organisation of existing knowledge

Members of the PSF and SCP Roundtable mentioned during the interviews that in some cases knowledge already exists in the food system that can help to understand critical issues around food sustainability. Some members of both collaborative platforms also claimed that the amount of available knowledge is overwhelming and difficult to manage and analyse for a single actor or organisation. Based on the analysis of the interviews, the researcher decided to choose the theme on the 'organisation of existing knowledge'. According to a former SCP Roundtable member and NGO representative:

> *"…there is no lack of knowledge and things. There are a lot of things out there that tell you how to do it sustainably. You have more and more reports and you are able to access all sorts of information and knowledge. So there is a lot of data out there. The problem is that they say that the data that are used by decision makers are the ones very often coming from the big business etc. and that are not necessarily supportive of agro-ecology or other things, as they don't have an interest" (7C).*

This statement also shows that certain knowledge sources are more likely to be analysed and managed than other sources. This relationship between business interests and knowledge is featured in Section 4.3.4. The interviewee also pointed out that *"… the problem is not to come up with the knowledge but to use it in the right way and to*

connect it" (1C). Thus, this indicates that what was once considered irrelevant or was undiscovered knowledge in the context of food sustainability might gain importance by linking it to other knowledge. This aspect of connecting and organising existing knowledge is also reflected through the collaborative work and structure of the PSF and the SCP Roundtable. The diverse multi-actor structure of both collaborative platforms function as a platform where existing knowledge is brought into the collaboration through the knowledge pool of each individual member. Most members from both collaborations stated that having a diverse pool of actors is a key element of connecting and understanding already existing knowledge along the food value chain. For many members of both collaborative platforms the *"benefit of working together where you suddenly discover the other dimension that you didn't really capture so far because you were not confronted with them" (1IE).*

According to a senior policy maker and government representative, the organisation of existing knowledge can be critical particularly within food sustainability and policy development. According to this interviewee it is important to maintain capability within government to capture and organise existing knowledge:

> *"…at the highest level of government, often there isn't that knowledge and particularly they are slimed down certainly here in Britain and in other member states you find slimed down departments and fewer civil servants. The in-depth knowledge that used to exist in the past doesn't exist anymore. So having access to that knowledge and information from different players within the sectors is important" (2GU).*

This government perspective on knowledge and food sustainability is also reflected in both collaborative platforms. According to PSF member:

> *"…the whole supply chain's interactions and environmental impact is so huge that no individual player can try and get their head around and understand and act on it. So it [the PSF] was all about sharing and understanding where the priorities are and it's usually evidence based. So when people say, 'this is actually something we didn't really expected it intuitively' and to get more towards an evidence based framework" (7IU).*

This statement also demonstrates the strong focus of this member on evidence-based policy including a positivist mind-set regarding the organisation and management of existing knowledge.

The exposition, connection and organisation of existing knowledge in the context of food sustainability is also represented in the SCP Roundtable. The multi-actor environment of the SCP Roundtable is regarded by its members as a beneficial structure. According to an SCP Roundtable member and food and drink manufacturer:

> *"…it's a big thing if we talk about food and sustainability and issues are so complex and it is a must if we want seriously address the issues and find solutions collectively. There is no one solution to solve this issue and it's impossible to solve this through only a limited number of people and actors. Nobody can pretend to know everything and no one is able to solve these issues and we need to work together and share ideas, otherwise we have to stop eating" (1IE).*

According to some members of both collaborative platforms a key contributor for this vast amount of knowledge in the food system is the expansion of the internet and digital-devices. For some members, this can also be utilised for the organisation of that knowledge pool through computer based online solutions. According to an SCP Roundtable member:

> *"…the open data approach can really change the way how we look for data and the dream of course is to have a European Google and to have a data search machine. So you don't look into individual databases but you put you word into a search engine which then looks to all the data bases" (1GE).*

In relation to technical and online solutions of knowledge creation, a former senior civil servant criticised the fact that there is a vast amount of un-organised and even undetected knowledge in the food system. This interviewee stressed that there are to some extent numerous technical instruments in the food system that automatically produce knowledge output but are in some cases undetected and even forgotten by officials that have put up these instruments in the first place. The example that was given by the former civil servant was an automated measuring instrument on a field in the countryside. The interviewee stated:

> "*…I was surprised that there was this measuring instrument and I asked if anyone knows about the data from that measurement and realised that no one even knew that this was out there and collecting data*" (4GU).

The PSF appears to incorporate within its collaborative structure the need to organise and understand existing knowledge in the food system. Particularly the high number of methodologies in the food system are regarded as overwhelming, confusing and disorganised. According to a PSF member, based on the vast availability of methodologies in the food system:

> "We [the PSF] have a *group that looks at methodology, which methodologies do we need to use to measure environmental impacts of grocery products" and at that time there were lots of different methodologies around. There was a lot going on there and I think under the PSF we said what we need is to set up a methodology working group to work out which mythology should we use and we can then sit down and going to all of the foot printing and products and compare them and see which products are better than other products*" (6C).

When both collaborative groups expressed their views on the organisation, management and utilisation of existing knowledge in the food system, they exclusively relate to quantifiable and measurable elements. This demonstrates as previously pointed out in this section that the PSF and the SCP Roundtable have a predominantly evidence-based and positivist relationship and understanding of knowledge.

4.3.2 Organisational knowledge on the food value chain

Research findings in Section 4.1.1 have illustrated that a core motive for many members of the PSF and SCP Roundtable is to understand and communicate with other actors along the food value chain and its different stakeholders. The interviews with members revealed the importance of knowledge that relates to the interaction between different stakeholders along the food value chain and the knowledge that helps to understand challenges from the perspective of others. The interviews showed that for some members of the PSF and SCP Roundtable, knowledge on the food value chain was fundamental in understanding the scope and complexity of food sustainability. It therefore appeared necessary to analyse the research findings through the theme of 'organisational knowledge on the food value chain'.

According to a PSF member, when working on food sustainability it is critical to focus on food value chain specific knowledge to:

> *"…the understanding from all the different players that kind of issues and […] the whole supply chains interactions and environmental impact is so huge that no individual player can try and get their head around and understand and act on it. So it was all about sharing and understanding where the priorities are …" (6C).*

Food value chain specific knowledge is highly regarded by several policy makers. Defra follows a farm to fork approach and according to a former civil servant this *"needs to involve producers, manufacturers, distributors and consumers. The government needs to work with the producers as only they really understand their supply chains" (4GU).*

Even though both collaborative platforms do not include actors from the entire food value chain (as in from 'farm to fork'), a partial representation of actors from the food system is present. According to several PSF and SCP Roundtable members having actors from different parts of the food chain allowed the collaborative platforms to understand and learn about organisational elements of the food system and its value chains. Thus, a key type of knowledge that was valued within both collaborative platforms was specific knowledge that relates to multi-actor interactions along the food value chain. It was not only important for members to gain knowledge about actors that are positioned in the immediate upstream and downstream of their supply chain, but also about the supply chain actors that are not in a direct relationship to a member.

For many members of the PSF, food value chain specific knowledge was regarded as a critical output of the PSF's collaborative work (4GU, 6C, 3C, 7IU, 3GU). According to a founding member of the PSF *"it was about actively engaging and mobilising the different actors in the food chain in a way that made them more comfortable to work together and to be more transparent with each other" (3C).* For this member value chain specific knowledge is a key aspect of understanding food sustainability and:

> *"…actions that came out of the PSF is because it was a multi-stakeholder forum. We had organisations in that forum, the major grocery supermarkets and some of the larger food manufacturers as well. We also had at The Forum for the Future WWF, Oxford Martin School and the Food and Climate Research Network and Friends of the Earth. So you can imagine, some of the conversations we had around food sustainability came from quite*

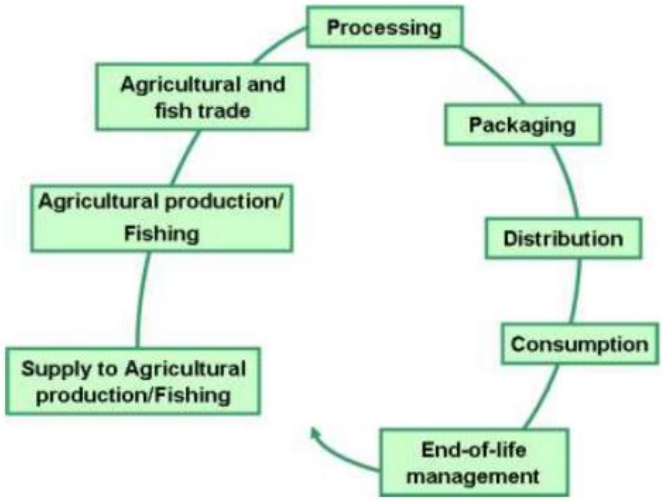
a different range of perspectives and views. It was very important for us from the start that we had this range of views in the room" (3C).

The importance of food value chain specific knowledge is also evident within the PSF's Pathfinder projects. These projects are a core work of the PSF and aim to understand environmental aspects within specific supply chains. The two pathfinder projects on potato and milk chocolate, demonstrate the focus on value chain specific knowledge.

Potato Value Chain (Co-operative Food and Farms) *"This project was a farm to fork assessment of the potential to reduce waste and improve resource efficiency in the potato value chain". Detailed data on resource inputs and losses across the value chain […] have been translated into £ costs at each stage and sub-stage (e.g. grading, storage, washing, sorting etc.)[…]"* (WRAP 2014b).
Milk/Chocolate Value Chain (Nestlé and First Milk) *"This project is a farm to fork consumer assessment of the potential to reduce waste and improve resource efficiency in the milk and chocolate crumb supply chain. A target of 5% waste reduction across the supply chain has been set"* (WRAP 2014b) .

A similar focus on value chain specific knowledge was investigated through SCP Roundtable's ENVIFOOD Protocol. The basis of this protocol is a methodology developed by the members with the aim to assess environmental performance in the food and drink sector. This core document published by the SCP Roundtable refers in several sections to the value and importance of food value chain specific knowledge and the transfer of knowledge along that chain. The leading principle of this ENVIFOOD Protocol is expressed as *"environmental information* communicated along the food chain […]" (The European Food SCP Roundtable 2013, p.19). A focus within the ENVIFOOD Protocol is the utilisation of food product specific life cycle analysis (see Figure 4.6).

Figure 4.6 Excerpt from SCP Roundtable's ENVIFOOD Protocol



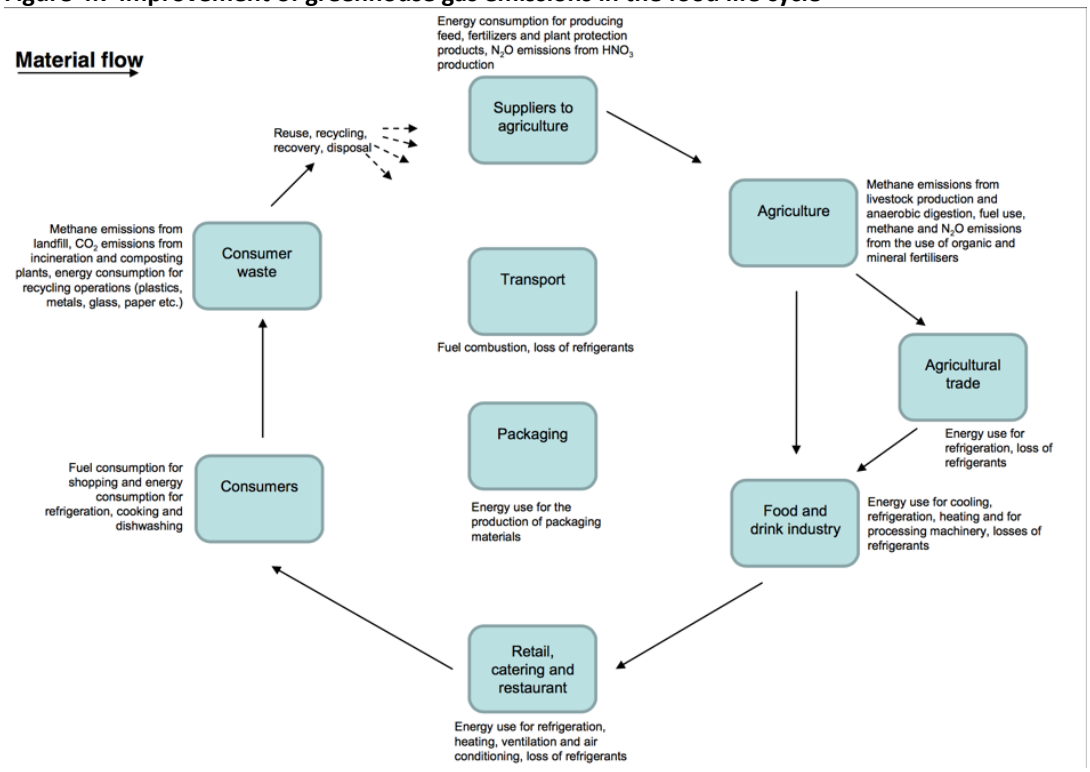
Source: The European Food SCP Roundtable 2013, p.12

This life cycle analysis is understood by the SCP Roundtable as "*consecutive and interlinked stages of a product system, from raw material acquisition or generation of natural resources to end of life, inclusive of any recycling or recovery activity*" (The European Food SCP Roundtable 2013, p.16). This multi-actor approach of the SCP Roundtable includes the sourcing and analysis of food chain specific knowledge. Not only the roundtable's ENVIFOOD Protocol, but also the perception of many SCP Roundtable members reveals a clear appreciation of knowledge that relates to the food value chain and its actors (1IE, 3IE, 7C). According to a SCP Roundtable member:

> *"The beauty of the roundtable is that involves different actors along the food value chain from agriculture to packaging manufacturers to food industry, to retails to NGO and to representatives of certain interest groups and the European Commission. So you have different perspectives and even different objectives around the table" (1IE).*

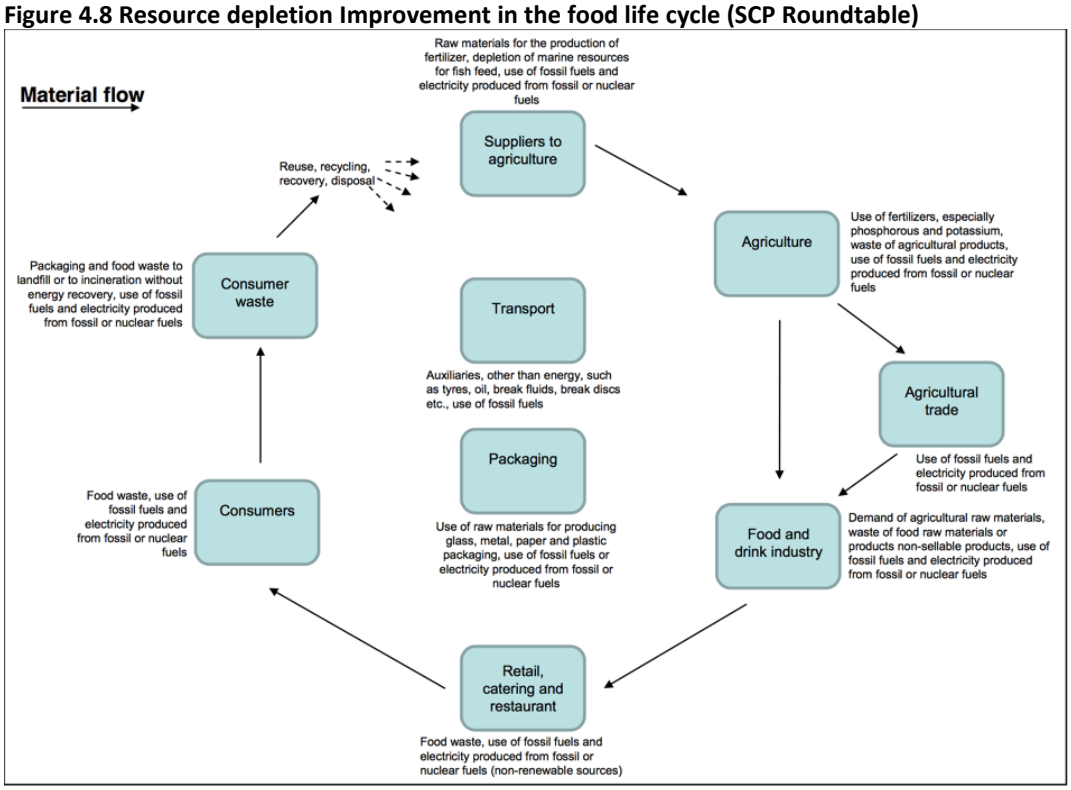
A closer look into the organisational knowledge of the SCP Roundtable's knowledge pool reveals a focus on certain food industry specific sections of the food value chain rather than being balanced with equal focus on all sections of the food chain. This aspect can be exemplified with the knowledge output of the SCP Roundtable's Working Group 3 (WG3) on Continuous Environmental Improvement. An excerpt of the final WG3 report on continuous environmental improvement along the food life cycle demonstrates the collaboration's food industry focus (see Figure 4.7 and Figure 4.8).

Figure 4.7 Improvement of greenhouse gas emissions in the food life cycle



Source: The European Food SCP Roundtable 2012, p.16

Figure 4.8 Resource depletion Improvement in the food life cycle (SCP Roundtable)



Source: The European Food SCP Roundtable 2012, p.18

The two figures demonstrate a food life cycle analysis which evaluates on greenhouse gas emissions and resource depletion. Both figures mainly focus on the scientific food industry knowledge and do not consider any elements on human health or animal welfare. This approach appears to be the overall food value chain approach of the SCP Roundtable in the context of their food sustainability work. Even though the SCP Roundtable aims for a diverse 'farm to fork' approach, their definition of a life cycle reveals a clear focus on food industry sections of the food chain including agriculture, transport or food production. Furthermore, it appears that the strong representation of food industry actors within the SCP Roundtable, and their approach to ''scientific knowledge'' have a strong impact on the structure and content of their organisational knowledge. Thus, in the context of the food sustainability work of the SCP Roundtable not all sections of the food value chain appear to be covered through their organisational knowledge. Those sections that are included in the organisational knowledge of WG3, have only a positivistic, technical and scientific perspective. On the one side this perspective aligns with the SCP Roundtable principle of being science-based, but on the other side it appears that diversity is lacking within their organisational knowledge.

The collaborative structure of the SCP Roundtable is also revealed by the activities of Working Group 4 (WG4) that focused on non-environmental aspects of food sustainability. The SCP Roundtable clearly states that their desire is to have an inclusive food value chain approach when working on food sustainability. According to WG4:

> *"Sustainability is a 'holistic' concept in two senses of the word. On the one hand, it means that meeting our present needs should not put future wellbeing at risk. The holistic sense of sustainability also implies shared responsibility and solidarity, which means taking into account the consequences on other stakeholders and society as a whole"* (The European Food SCP Roundtable 2010c, p.3).

The final report of that working group was published in 2010 and covers the two areas of economic and social food sustainability, which the SCP Roundtable defines as areas of non-environmental sustainability (The European Food SCP Roundtable 2010c). The content of this final report illustrates a clear focus on the economic aspects of food sustainability, whereas the social dimensions of food sustainability appears to play only

a minor role within the report (only three pages out of 15 focus specifically on social aspects of food sustainability). This shows that even though the SCP Roundtable included a dedicated working group on non-environmental aspects of food sustainability and a desire to have a 'holistic' food value chain approach, the actual work of the collaboration shows limitations and a non-holistic approach.

Some participants of both collaborations stated that it can be challenging to capture authentic knowledge on the food chain (7C, 3IE, 1C, 5IU). An external expert of the SCP Roundtable and NGO representative pointed out that it is critical to understand the origin of food chain specific knowledge. In a collaboration this can relate to the actual pool of members that claim to represent a food chain. When considering the sourcing of knowledge on the food chain, that NGO representative stated that:

> *"you need to check which part of the value chain they actually represent and what level of the chain. Even within one organisation or actor there can be big internal differences and you need to check who it is that is the representative" (7C).*

Some members and external experts from both collaborations stated that the knowledge output required is sometimes greater than what members can provide (5IU, 7C, 1C, 4IE). Thus, according to a PSF member it is critical to maintain the "*balance as much as possible across the value chain*" (5IU) when working collaboratively on food sustainability.

4.3.3 The dominance of ''scientific knowledge''

The theme on the dominance of ''scientific knowledge'' appeared to be highly relevant in understanding and structuring the research findings. The researcher selected this theme, because interviews suggested that the PSF and SCP Roundtable have a strong positivist understanding of knowledge. This is demonstrated, for example, by their focus on particular kinds of ''scientific knowledge'' and on their understanding of evidence-based policy. In addition, the importance of ''scientific knowledge'' for the SCP Roundtable and PSF is clearly outlined on the webpage of both collaborative platforms.

Table 4.3 demonstrates two core self-reflecting statements of both collaborative platforms which show the significance of ‘‘scientific knowledge’’ for them.

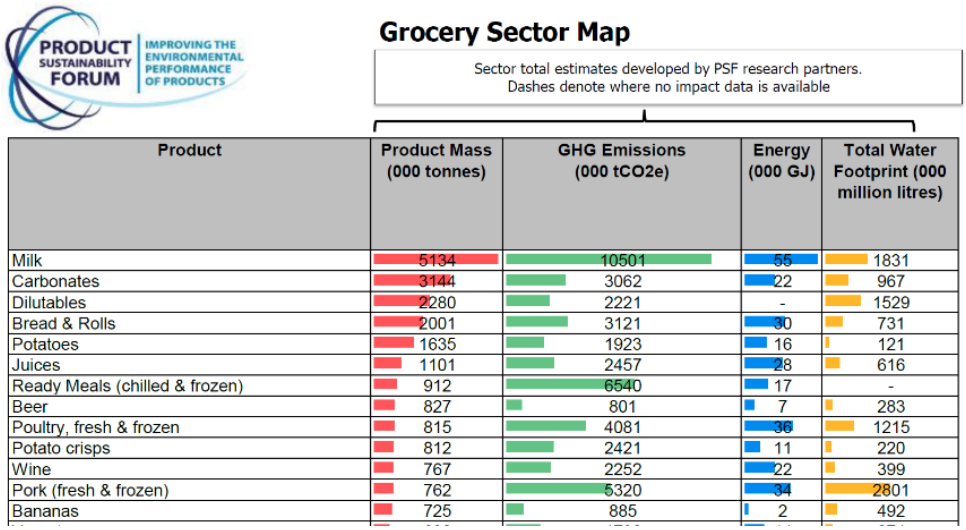
Table 4.3 Self-reflecting statements of the PSF and SCP Roundtable

Organisation	Statement	Comment
European Food SCP Roundtable	“The members of the European Food Sustainable Consumption and Production Roundtable are identifying scientifically reliable and uniform environmental assessment methodologies for food and drink products, including product category specifications where relevant, considering their significant impacts across the entire product life-cycle” (FOOD European Food SCP Roundtable 2016).	The SCP Roundtable points out their focus on science based knowledge that should help to develop a homogeneous assessment for environmental food sustainability.
Product Sustainability Forum	“It includes information from a wide selection of sources, such as government and private sector-funded scientific research, product life cycle assessment and footprinting studies, market and CSR reports and insight, peer reviewed journals, eco-labelling and environmental product declarations and case studies” (WRAP 2017).	Here PSF is reflecting on its ‘Knowledge Base’ pointing out the focus on ‘‘scientific knowledge’’ and the use of diverse sources (mainly within science based knowledge forms).

Source: Author, using organisation’s publication

A deeper analysis of documents and web content of both collaborative platforms reflect that the PSF and the SCP Roundtable have a preference towards the use of quantifiable scientific forms of knowledge. An example is the approach of the PSF in providing evidence in their reports and illustrations. Figure 4.9 illustrates PSF’s Grocery Sector Map that shows the potential impact of certain food products. The reader is predominantly confronted with numbers and figures of scientific elements including abbreviated scientific terms.

Figure 4.9 PSF Grocery Sector Map



PRODUCT SUSTAINABILITY FORUM — IMPROVING THE ENVIRONMENTAL PERFORMANCE OF PRODUCTS

Grocery Sector Map

Sector total estimates developed by PSF research partners.
Dashes denote where no impact data is available

Product	Product Mass (000 tonnes)	GHG Emissions (000 tCO2e)	Energy (000 GJ)	Total Water Footprint (000 million litres)
Milk	5134	10501	55	1831
Carbonates	3144	3062	22	967
Dilutables	2280	2221	-	1529
Bread & Rolls	2001	3121	30	731
Potatoes	1635	1923	16	121
Juices	1101	2457	28	616
Ready Meals (chilled & frozen)	912	6540	17	-
Beer	827	801	7	283
Poultry, fresh & frozen	815	4081	36	1215
Potato crisps	812	2421	11	220
Wine	767	2252	22	399
Pork (fresh & frozen)	762	5320	34	2801
Bananas	725	885	2	492

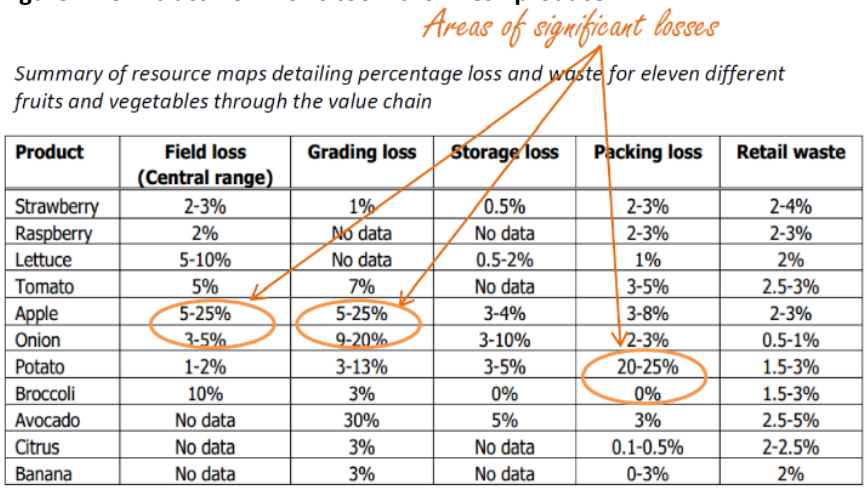
Source: Product Sustainability Forum 2014a

A further example from the PSF regarding their focus on quantifiable ‘‘scientific knowledge’’ is an online document that describes their ‘Toolkit’ for fresh food produce. According to the PSF this toolkit provides a guidance for actors along the food chain to implement more sustainability. The focus of this ‘Toolkit’ is the development of:

> *“a whole-chain resource efficiency (WCRE) project [which] uses a problem-solving approach to reduce waste and losses and improve resource efficiency across the entire product value chain – from farm to fork”* (Product Sustainability Forum 2014b).

‘scientific knowledge’ expressed through numeric data plays a key role within the document that outlines the WCRE project (see Figure 4.10).

Figure 4.10 Extract from PSF's toolkit for fresh produce



Areas of significant losses

Summary of resource maps detailing percentage loss and waste for eleven different fruits and vegetables through the value chain

Product	Field loss (Central range)	Grading loss	Storage loss	Packing loss	Retail waste
Strawberry	2-3%	1%	0.5%	2-3%	2-4%
Raspberry	2%	No data	No data	2-3%	2-3%
Lettuce	5-10%	No data	0.5-2%	1%	2%
Tomato	5%	7%	No data	3-5%	2.5-3%
Apple	5-25%	5-25%	3-4%	3-8%	2-3%
Onion	3-5%	9-20%	3-10%	2-3%	0.5-1%
Potato	1-2%	3-13%	3-5%	20-25%	1.5-3%
Broccoli	10%	3%	0%	0%	1.5-3%
Avocado	No data	30%	5%	3%	2.5-5%
Citrus	No data	3%	No data	0.1-0.5%	2-2.5%
Banana	No data	3%	No data	0-3%	2%

Source: Product Sustainability Forum 2014b

Not only does the published material of the PSF revealed a strong focus on 'scientific knowledge', the majority of interviewed members of the PSF have also expressed their preference for utilising and expressing issues on food sustainability through 'scientific knowledge' (3GU, 3C, 6C). A core founding member of the PSF and former policy maker stated that:

> *"…if you don't have science it's all sort of NGO speak. For us in governments it's always oh here we go again the NGOs are shouting. You have to get the science and you have to keep finding more science and sometimes there are some points where I find it quite frustrating. We still don't have a really good scientific analysis of many things. The thing is that you do need the whole behaviour change set as well. So you have to have social science involved, because people don't just change behaviour randomly and there are reasons why people change behaviour and there are lots or reasons why they don't. I' mot just only talking about citizens but also scientists and policy makers and all sorts of people"* (3GU).

This quote not only demonstrates a strong desire and demand for 'scientific knowledge', but also reveals a ranking of different types of knowledge. Particularly knowledge that is developed with the intention of convincing and persuading stakeholders. Such types of 'scientific knowledge' are held in high regard by policy makers. Thus, members of food related collaborative platforms are aware of the existence of non-'scientific knowledge' but demonstrate a higher value for 'scientific knowledge' in the context of food sustainability. Contrary to the published material and the majority of PSF members, some members understand 'scientific knowledge' as an approach to understand food sustainability topics from a wider, universal and more generic perspective. For those members the level and intensity of 'scientific knowledge' is less about numeric details and more about a bigger scientific picture. According to a long term PSF member:

> *"…the PSF had a much wider and general understanding rather than explicit numbers on 50g of paste or 120 grams of that other pasta. If you know where the hotspots are and it may not be perfect scientific information, but it's good to use it and do something about it" (7IU).*

Some members stated that they are aware of their preference for using and expressing food sustainability elements through scientific and technical knowledge. This awareness

is also linked to the communication with actors that are aware of scientific or technical knowledge. According to a PSF member from a large grocery chain stated that:

> *"…most people like myself tend to walk in with a technical knowledge of the issue and some degree a technical knowledge about how they played in supply chain interactions. At the various points when we did conferences or kind of communication pieces, the group was very mindful but it needed to engage from a development professional, for example who would work out how this stuff sort of feeds in to supply chain management, or senior decision makers, because we were very clear that we, amongst us would tend to talk quite technically, but if that stuff is actually going to happen then it has to engage people in different roles as well" (5IU).*

The SCP Roundtable appears to have similar strong focus on scientific, technical and numeric knowledge to the PSF. The analysis of the key documents from the SCP Roundtable's ENVIFOOD Protocol revealed the featuring of strong technical and 'scientific knowledge'. The core principle of the ENVIFOOD Protocol's methodology is outlined by the SCP Roundtable as the communication and transfer of environmental information that are "[…] *scientifically reliable and consistent, understandable and not misleading, so as to support informed choice"* (The European Food SCP Roundtable 2013, p.7). Figure 4.11 is an extract of the ENVIFOOD Protocol and illustrates the SCP Roundtable's approach for identifying potential environmental impacts by using indicators that feature a strong scientific, quantifiable and technical character.

Figure 4.11 Extract of the SCP Roundtable's ENVIFOOD Protocol

Impact Category	Impact Assessment Model	Indicators	Source
Climate Change	Bern model - Global Warming Potentials (GWP) over a 100 year time horizon.	kg CO_2 equivalent	Intergovernmental Panel on Climate Change, 2007
Ozone Depletion	EDIP model based on the ODPs of the World Meteorological Organization (WMO) over an infinite time horizon.	kg CFC-11 equivalent	WMO, 1999
Ecotoxicity for aquatic fresh water	USEtox model	CTUe (Comparative Toxic Unit for ecosystems)	Rosenbaum et al., 2008
Human Toxicity - cancer effects**	USEtox model	CTUh (Comparative Toxic Unit for humans)	Rosenbaum et al., 2008
Human Toxicity – non-cancer effects**	USEtox model	CTUh (Comparative Toxic Unit for humans)	Rosenbaum et al., 2008
Particulate Matter/Respiratory Inorganics	RiskPoll model	kg $PM_{2.5}$ equivalent	Humbert, 2009*
Ionising Radiation – human health effects	Human Health effect model	kg U^{235} equivalent (to air)	Dreicer et al., 1995
Photochemical Ozone Formation	LOTOS-EUROS model	kg NMVOC equivalent	Van Zelm et al., 2008 as applied in ReCiPe
Acidification	Accumulated Exceedance model	mol H+ eq	Seppälä et al.,2006; Posch et al., 2008
Eutrophication – terrestrial	Accumulated Exceedance model	mol N eq	Seppälä et al.,2006; Posch et al., 2008
Eutrophication – aquatic	EUTREND model	fresh water: kg P equivalent marine: kg N equivalent	Struijs et al., 2009 as implemented in ReCiPe

Source: The European Food SCP Roundtable 2013, p.31

Similar to the PSF, some SCP Roundtable members expressed their preference for utilising 'scientific knowledge' over other non-scientific types of knowledge. According to a founding member of the SCP Roundtable:

> *"If you look at the ENVIFOOD Protocol that's knowledge as a concept or methodology and a standard on how to perform life cycle assessment for food and drink products. So that's kind of knowledge I would say and scientific clearly, second more everyday knowledge or basic knowledge […] I mean by this, practical things that are closer to reality" (1IE).*

The dominance and importance of 'scientific knowledge' within the SCP Roundtable is for many of its members a starting point of viewing and understanding food sustainability. This is particularly influenced by the roundtable's founding principles that strongly emphasise 'scientific knowledge'. Some members however show an awareness of the potential limitation of utilising predominantly 'scientific knowledge'. For one SCP Roundtable member:

> *"…relying on a science-based approach is one of the founding principles of the roundtable. So otherwise it would be even more difficult to come to consensus within the group. At some point you can question properly science is not the only approach to be taken, but that's a precondition, that's a given in the roundtable" (3IE).*

This element of a given precondition of knowledge in the food system was also referred by some SCP Roundtable members as an existing infrastructure that benefits the creation and utilisation of 'scientific knowledge'. Even though the research findings have revealed a strong focus on scientific and quantifiable knowledge within both collaborative platforms and current policy making, some interviewees stated that it is important to open up for other non-'scientific knowledge' forms. Some policy experts and members of the PSF and SCP Roundtable regarded the dominance of 'scientific knowledge' as a barrier for the recognition of other knowledge forms. A former policy maker in food and health stated that a rethinking is happening in government to not overemphasise 'scientific knowledge'. The former government employee stated that:

> *"…there has been an evolution in thinking about that over the last 30 years. I think most of us, when I was first in government on this subject, we would have said 'well knowledge is the facts' the hard scientific facts who tell you exactly what to do. But then we gradually came to realise that inside and outside government that's not enough actually, because the answers are not as simples as they seem, even in the scientific sense; there are facts that interact with other facts, what causes what we don't know and then there is a whole other area what do people think and what do people feel?"* (4GU).

4.3.4 Knowledge on the nexus of food sustainability and business

Both the PSF and the SCP Roundtable have a strong core membership of food industry actors, and are industry-led. This suggests that the platforms are likely to have a strong interest in business relevant topics. This became evident through the interviews, as many members stated the central role of business interests when creating and sharing knowledge on food sustainability. Members explained that a regular trade off process is mentally ongoing. This thinking includes the consideration between knowledge that helps to improve food sustainability and potential short-term disadvantages for the core business of a food industry actor. Based on these insights, the researcher selected the theme on 'collaborative learning and the nexus of food sustainability and business'.

A former SCP Roundtable member expressed a critical view on knowledge that appears to be sourced from a broad spectrum of food value chain representatives and states that knowledge is *"[…] very often coming from the big business etc. and they are not necessarily supportive of agro-ecology or other things, as they don't have an interest" (1C).* In this relation, other members of both collaborative platforms claimed that certain types of knowledge that are not directly linked to business interest can become relevant for food industry actors if they align with consumer demands. According to an NGO representative and former SCP Roundtable member the initial interest for food industry representatives:

> *"…starts from business interests and not so much because they care about the environment. But then of course, by being more sustainable you can also reduce your costs when it comes to energy or other parts. I would say it's really just because of consumers demand" (1C).*

Similarly, for some members of the PSF, knowledge on food sustainability is particularly seen as valuable in the context of business interests. When asked about types of critical knowledge on food sustainability, a PSF member and food retail representatives stated that it is "*about how to frame sustainability in language that makes sense for business and which compile business to that is another type of knowledge to share" (1IU).*

Business related knowledge was also often described during the interviews as practical knowledge that is close to real-world scenarios of food related businesses. Some food industry actors who have been involved in collaborative multi-actor activities stated that the knowledge output of collaborations is often too theoretical and therefore less likely to be implemented in food businesses. According to a PSF member and drink manufacturer, food businesses are *"always up for saving money and they are always up for doing something that the customer wants that might be new" […]* (4IU). Thus, this food industry representatives concluded that "*companies need practical advice and practical knowledge that they can put into place in their work place and sometimes these things were going around at such a high level and there wasn't anything practical to come out of it"* (4IU).

The sensibility of certain members of both collaborations towards food industry and business-related knowledge is particularly evident with knowledge that reflects negative business aspects. For many members this is a balancing act between the acceptance of knowledge that is critical towards industry and the potential damage to the image of their own food business. A document by the SCP Roundtable that contains a critical view of the food and drink industry includes knowledge that is potentially useful in the context of food sustainability. However, according to an SCP Roundtable member:

> *"nobody likes this report […] because it talks honestly about the problems with our industries, but then there was a bit a hype with everybody on […] the figures that we could defend. So I remember we negotiated a lot within the […] industry on 'how far do we go to explain the issues, the critical issues with [Food industry A]?'. Nobody is promoting this so nobody has even told you that there is that type of document, but you can find it easily on the homepage of the SCP roundtable" (2IE).*

The importance of food business related knowledge for both collaborative platforms is also reflected in some of their published materials. An example of this are the case study documents on the PSF's Path Finder Projects. Figure 4.12 is an excerpt of a presentation by the PSF that outlines key findings of their Potato Value Chain pathfinder project in liaison with the retailers Co-operative Food and selected potato farms.

Figure 4.12 Excerpt of PSF's presentation on the Potato Value Chain pathfinder project



Source: Wrap 2014a, p.1

This first page of the presentation shows how the emphasis regarding the outcomes of this path finder project is on business related aspects, described here as 'value lost in the potato supply chain'. Similar to some PSF publications, the ENVIFOOD Protocol of the SCP Roundtable also reveals a focus on business related knowledge. The ENVIFOOD Protocol's methodology on the assessment of environmental impacts relates in several sections to the importance of incorporating and considering business interests. Particularly some principles in regard to voluntary environmental assessment and communication point out the importance of considering food business interests (The European Food SCP Roundtable 2013). Principle eight of the ENVIFOOD Protocol for example aims to ensure that all actors across the food chain aiming to use the methodology have no additional disproportionate burden. According to the SCP Roundtable such burdens are described as "[…] *extraneous factors or requirements such as procedural complexity, disproportionate costs, or unreasonable information or bureaucratic demands"* (The European Food SCP Roundtable 2013, p.47). The SCP Roundtable's focus on such business-related elements have also been set out on a more global level in their tenth principle, which outlines the importance of protecting the environment while considering the interests of internal markets and international trade agreements. Thus, according to the SCP Roundtable their methodology:

> "*shall not be prepared, adopted, or applied in a manner which would constitute a distortion of competition or an unjustifiable obstacle and to the proper functioning of the Internal Market of the European Union and to the international trade agreements. […] [This] will help promote a smoother articulation […] of free trade and environmental protection*" (The European Food SCP Roundtable 2013, p.47).

The SCP Roundtable's focus on food business related knowledge and the potential benefits of that knowledge economically can also be seen at their WG4 that focused on non-environmental aspects of food sustainability. As mentioned earlier in this section, only the two areas economic and social food sustainability are featured in the report, whereas content relating to economic aspects are more dominant and detailed. Content that relates to social aspects of food sustainability is either vague and lacking in detail or has an economic perspective to it. Excerpts from the SCP Roundtable's WG4 report that relates to social aspects provide a good illustration of this research finding. The

report states in relation to The SCP Roundtable's non-environmental aspects on land grabbing:

> *Land grabbing is a growing concern for developing countries and may have major impacts on small farmers and land workers in countries where land rights are not clearly established. These issues should be carefully assessed when developing sustainability schemes and policies (The European Food SCP Roundtable 2010c, p.9).*

This example on land grabbing illustrates on the one side the vagueness and lack of detail in relation to the social aspects of WG4 on land grabbing. A second example from the same report features the SCP Roundtable's non-environmental aspects on food security. The report states that:

> *"In cases of win-win situations, resource efficiency measures should not affect food prices and may even save costs along the food chain. Nevertheless, there might be cases in which the implementation of a specific sustainability initiative can create disproportionate costs, which are then reflected in prices. Still, the cost of non-sustainable development is not viable" (The European Food SCP Roundtable 2010c, p.7).*

This example on food security relates to the social aspect of food security, but the report reveals a clear economic perspective embedded in the content. Some members of both collaborative platforms and external experts from the food and drink industry claimed that it is essential and inevitable to include business interests within food sustainability (4IE, 3IE, 2IE, 4IU, 4GU). The rationale behind this thinking was based on the viewpoint of some interviewees that sustainability is something to be achieved within the current agro-industrial food system. According to a former food sustainability expert within a food and drink manufacturer:

> *"…it's very dangerous to be critical of companies that do something because you criticise them for doing something, because we can't do everything. So then companies do nothing because they cannot do everything. So even when I was at [Food and Drink manufacturer B] it would have been great that [drink product A] was zero carbon. But if you did that then somebody would say why don't you do all of [your drink products] globally zero carbon? Hang on at least they are doing something to move forward because we couldn't get to perfection in one step"* (4IE).

Furthermore, this interviewee along with other food industry experts, described how there is a rethinking in the food industry to not only focus on short term benefits as it used to be, but also on the long-term implications of food sustainability on their

business. Particularly the sourcing of raw materials and resources for food production appears to be critical from a long-term perspective. According to a food industry expert:

> *"many companies are now trying to help farmers, who use the most water to drip irrigation and not [to] irrigate in the middle of the day, not [to] over flood their fields because of the height of their generators and move to maybe higher value crops which use less water. So they [food companies] have to not only help each company to help itself, but also work with the local community, because they need secure supply of water for long term future" (4IE).*

This aspect of focusing on long-term commitment in relation to food sustainability also appears to be critical within the collaborative environment of the food system. The PSF for example is a collaboration that functions as a transit platform from the Courtauld Commitment to the Courtauld 2025 Commitment. It appears that the majority of current PSF members are likely to sign and participate in the Courtauld 2025 Commitment, knowing that the commitment will have a focus on long term effects. According to a PSF members and large UK national food retail representative:

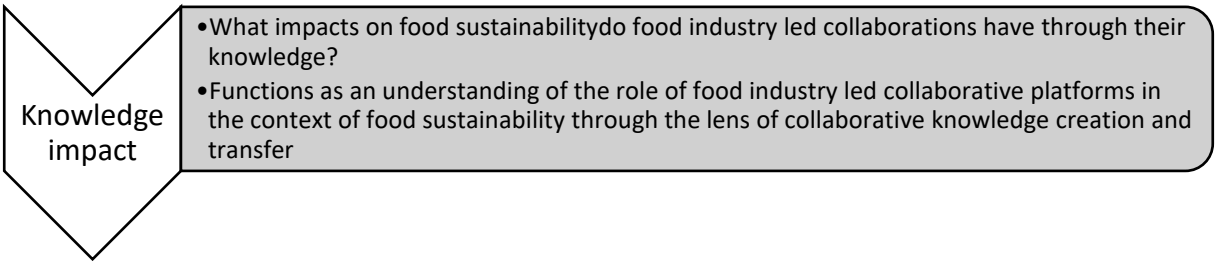
> "*A lot of people will sign up for that [Courtauld 2025] because it's a long-term piece that will challenge and I hope and I'm assuming given the processers and the senior officers within the businesses that are going to sign this commitment and then there will be people like me in other organisations have the authority to start; not to change things dramatically but to start to change things that ultimately lead to dramatic change. These things have to be built and embedded in businesses over time*" (3IU).

4.4 RQ4: The impact of collaborative knowledge on food sustainability

RQ4: What impacts on food sustainability do food industry led collaborations have through their knowledge?

This section elaborates on the impact of collaborative platforms on food sustainability through their collective knowledge. Thus, the findings in this section relate to the fourth research question of this research (see Figure 4.13).

Figure 4.13 Figure Logical structure of the research questions: Knowledge output



Source: Author

Chapter four has explored in Sections 4.1 - 4.3 predominantly internal aspects of the two collaborative platforms PSF and SCP Roundtable. These included the motives of actors to join a collaboration, collaborative learning and knowledge sharing processes and the types of knowledge created collaboratively. The research findings presented in this section function as a fourth step in analysing collaborative learning and knowledge creation within food sustainability. This section reflects on the perceptions of members on how their collaborative knowledge has affected food sustainability. This section also aims to explore the strategies used by the two platforms to promote their knowledge to stakeholders. The PSF and SCP Roundtable incorporated in their self-definition a clear commitment to not only analyse and gather knowledge on food sustainability, but also a desire to have an impact on the food system and its stakeholders (The European Food SCP Roundtable 2015a; WRAP 2017). Out of the 16 key themes of this research, the following three themes relate to the knowledge impact of the PSF and SCP Roundtable:

I. Concrete and direct food policy recommendations

II. Improved understanding and exploration of food sustainability
III. Voluntary industry led changes with the aim to improve food sustainability

The first knowledge-impact theme revolves around concrete and direct policy recommendations in the context of food sustainability. A central element to this is the organisational links of the PSF and SCP Roundtable to governmental bodies through their membership. This includes the implementation of food sustainability specific knowledge as recommendations for governmental policies. The second theme relates to the overall confusion and lack of homogeneity within food sustainability. Both collaborative platforms have worked towards an improved understanding of a harmonised food sustainability standards. The third theme focuses on voluntary industry led changes in the food system that aim to implement more sustainability. This is particularly fostered through the current preference by some European governments to promote sustainable practices in the food industry through voluntary agreements instead of formal legislations. Some of the content that is presented in this section is overlapping and relates to more than one theme. Thus, all of the following research findings need to be seen as cross-cutting themes rather than isolated findings.

According to some members of the PSF and SCP Roundtable, certain gatekeepers are critical for the promotion of their collaborations knowledge. Gatekeepers or respected actors, such as the Nestlé, the EC or WRAP and can function as critical players in the promotion and utilisation of the knowledge of the collaboration. Particularly the SCP Roundtable sees the benefit of gaining access to other food sectors and domains through their members (The European Food SCP Roundtable 2015a; WRAP 2017).

4.4.1 Concrete and direct food policy recommendations

This section focuses on the effects of the PSF and SCP Roundtable on the food policy arena through their collaborative knowledge. This theme on concrete and direct food policy recommendations was selected by the researcher based on the interviews as well as on the fact that governmental actors are embedded within the collaborative structure

of the PSF and SCP Roundtable. Most members within the PSF and SCP Roundtable have reflected through the interviews a clear understanding of how their collaboration is designed to have an impact on policy making. According to an SCP Roundtable member:

> *"…the food roundtable is a policy response, we always try to do something what otherwise could be potentially done by the Commission and that's interesting to see because there are many people in Brussels paid to be in Brussels who navigate the food roundtable to Brussel's policy and I'm remote, so I'm simply interested how that goes but at the moment it's really a very unproductive setting" (2IE).*

This aspect is particularly evident as both collaborative platforms have a direct link of communication to national and European governmental bodies through political gatekeepers. This embedding of governmental actors within collaborative activities is underlined by the perceptions of some PSF and SCP Roundtable members (1GE, 7IU, 5IU, 3IE). The structure and membership of the two collaborations include the two actors WRAP and the EC. WRAP can be seen as an indirect representative of the UK government since it receives its funding from Defra and other UK governmental bodies. WRAP provides organisational support to the PSF but is also involved in the framing and analysis of the work of the collaboration. According to a PSF member a strong link between the collaboration's work output and policy makers is that *"[…] they were in the room, as both funders and representatives at all the meetings (5IU).*

The SCP Roundtable is co-chaired by the EC which enables the collaboration to not only engage with representatives of EU policy makers, but also promote their knowledge directly to the EC. According to an SCP Roundtable member there is:

> *"…the exchange between the law makers and the law implementers and […] the exchange of information and opinion […] and there should be some concrete output in the scope of recommendations in contributions to policy making" (1GE).*

This relationship between the EC and the SCP Roundtable went, according to a number of SCP Roundtable members, through different phases which impacted the SCP Roundtable's impact on EU policy making. The first years of the SCP Roundtable were predominantly perceived by most members as the most efficient time of impacting EU policy. This was particularly fostered through the support and close collaboration of the

EC. This momentum was according to some SCP Roundtable members particularly provided through the membership of the NGO WWF, as it gave the SCP Roundtable greater knowledge and a higher level of public legitimacy. However, with the decreased interest of the EC in recent years of the SCP Roundtable, some members and external experts perceived a less efficient period in contributing to the food policy agenda of the EU. According to several SCP Roundtable member the departure of an individual that represented the EC within the collaboration was seen as one of the key reasons for the decreased interest of the EC. This perception of decreasing effectiveness was described by an SCP Roundtable founding member as a 'bit of waste of time' since:

> "*… we [SCP Roundtable} are not trying to agree on something, we are just more or less confusing each other and we are not following a clear mandate or we are not focusing on a clear output currently and that is for me more or less a waste of time*" (2IE).

This focus on connecting the output of the collaborative content to the government policy level was also emphasised by the members of the PSF. According to a PSF members the involvement of governmental actors, such as WRAP and Defra are central as:

> "*…they are part of the founders, they are on the steering group, so as the Scottish government and the Welsh assembly and I think they are absolutely key player there. So they are aware of the work and the current government is moving away from regulations and more towards collaborations and they leave it up the responsible players to do it"* (7IU).

This perception has also been expressed by governmental actors who have been interviewed. The majority sees it as important to develop policies with a cross-sector approach across the food chain. According to a UK senior policy maker "*[…] you get much better policy making if you have those players sitting around the table and in the room together or, at least being consulted on policy issues and policy areas*" (2GU). Evidence in the real-world for this kind of policy consultancy can be taken forward by the role of the SCP Roundtable's ENVIFOOD Protocol in EU policy making. According to an SCP Roundtable member:

> "*The main deliverable of the roundtable has been the Food Protocol and in the context of the environmental footprint activities of the Commission, they make an explicit reference to the Food Protocol that this is something that should be used and this is a clear measurable success for us*" (3IE).

This explicit reference of the work of the SCP Roundtable is linked to the EC Product Environmental Footprint project launched in 2015. This pilot aims to establish a harmonised methodology to assess environmental performance of food and non-food products. This PEF Pilot has included content from the SCP Roundtable's work and "*they [EC] have embedded […] into their methodology the ENVIFOOD Protocol […] that has been developed in the SCP Roundtable*" (1IE). Some members have even claimed that the outcomes of the SCP Roundtable's work had an impact in Australia and the Asian region (1IE). This statement, however, was only expressed in the interviews and could not be confirmed through the document analysis.

Some members of both collaborative platforms see it as their responsibility to inform and advise policy makers. The rationale behind this perceived advisory role is that "*you have to accept that most decision makers and businesses in policy circles are non-technical people*" (3C). Thus, according to a PSF member their platform is described as:

> "*…The Babel Fish of the food industry that allows the translation of quite technical and detailed research into non-technical terms that decision makers need and get on. That is really important. […] When we were looking at things like the hotspots analysis and priority products, we presented that information in slide decks not word documents, because they are instantly visual and they allow you to use a range of different communication mediums…*" (3C).

Even though the desire of both collaborations and their members was to have an impact on policy making, the outcomes and the members' perspective on this desired goal were mixed. The confidence of some members in being successful in impacting policy making appeared to be weak. Despite structural and organisational involvements of governmental actors, some members stated that they feel dependent on the preferences of the governmental actor about whether knowledge is actually utilised and implemented in policy making. According to a PSF member "*[…] you can give them (governmental actor) the information and give them the support, but whether they adopt it is an entirely separate issue*" (8IU).

This constellation can also be related to the aspect of changing governmental preferences and as a response to sudden and incremental changes in the policy agenda. An overall view that was expressed through the interviews that politicians, governments and thus, preferences in developing or changing policies can be impacted by specific and unpredictable developments in the real-world. According to a senior UK policy maker and former head of Defra, governmental preferences in adapting knowledge from collaborative activities can be dependent on current events and debates. The interviewee stated that a government can be interested in labelling and food waste, but change quickly to another focus, such as plastic bags (1GU) and:

> "*when we (the UK) have an animal disease outbreak, the government is of course working with the industry to try and control it. We learned the lessons from the mouth and foot outbreak in 2001, where actions to stop its spread was far too late and there was a review, on which we reflected, brought in new guide to what to do if that happened again…*" (1GU).

The research data has also revealed that collaborative platforms find themselves in a competition with other collaborative groups that work in the same or similar area of food sustainability. For the former SCP Roundtable member, beside collaborations such as the SCP Roundtable, "*we have a lot of other forums so this is not so much of a unique added value*" (1GE).

4.4.2 Improved understanding of food sustainability

A core motive for actors to participate in the PSF and SCP Roundtable is to find and agree on harmonised standards on food sustainability (see Section 4.1.). This motive is reflected in the efforts of both collaborative platforms to improve and add knowledge to the understanding of food sustainability. This was demonstrated throughout the interviews and document analysis. The researcher has therefore selected the theme on 'improved understanding and exploration of food sustainability'. According to the SCP Roundtable "*the members of the Food SCP Roundtable recognise the need to establish a*

scientifically reliable, practical and harmonised environmental assessment methodology for food and drink products across Europe […]" (The European Food SCP Roundtable 2013, p.7).

The underlining argument for many industry members was the potential of reducing cost by having a cross-sectorial agreement over harmonised standards on food sustainability. Particularly the SCP Roundtable's ENVIFOOD Protocol is a contribution by the members to explain what food sustainability is and how it can be measured and valued. According to a statement within the SCP Roundtable's ENVIFOOD Protocol:

> "An increasing number of operators as well as public authorities have introduced a widening range of different initiatives to inform consumers and other stakeholders about various environmental characteristics of food and drink products and to support continuous improvement in associated environmental performance. These include various labels, statements, product declarations and other means addressing different environmental aspects or impacts of a product. This on-going proliferation of different initiatives is highly diverse in terms of the chosen scopes, assessment methodologies and means and tools of communication. As this situation has the potential to confuse or even mislead consumers and other stakeholders and to lead to unnecessary burdens for food chain operators, the Food SCP Roundtable has established the ENVIFOOD Protocol to support environmental assessments of food and drink products" (The European Food SCP Roundtable 2013, p.9).

This contribution of the SCP Roundtable to food sustainability was not only developed by the members but was also promoted to businesses and organisations around Europe. According to an SCP Roundtable member:

> "*…those that drafted the Protocol or the secretariat went around to promote that […] in science and the Food Roundtable had an interest to back this up by dialogue in science. I also think the Food Roundtable strongly promoted that protocol in context with the PEF (Product Environmental Footprint). The PEF took up in the guidance that the ENVIFOOD Protocol applied and in the PEF2 that the Commission has drafted. That was of course I think the biggest success or biggest policy impact that we could achieved with that ENVIFOOD Protocol that the Commission really recognised as useful amendment to their own method that they developed*" (2IE).

The way the ENVIFOOD Protocol has been developed, was based on a number of ENVIFOOD pilot tests with over 18 participants. These predominantly food industry actors have tested from March 2013 until September 2013 various elements of the

ENVIFOOD Protocol within their own companies and on specific food products (see Table 4.4).

Table 4.4 Participants to SCP Roundtable's ENVIFOOD pilot test

Organisation	Product
Granarolo (Italy)	mozzarella cheese packed in a polyethylene bag
CarlsbergItalia	Beer products
Campden BRI (Research organisation, Hungary)	soy and beef products
European Bottled Water Federation	PET and returnable glass bottles for still and sparkling water
Coop Italia	high quality milk 1lt
Nestlé	Purina Gourmet Pearl Chicken (cat product), NaturNes (baby food product), Nescafé (coffee)
UNESDA	non-alcoholic drinks
Federación Española Del Vino (Spain)	Wine
Barilla	American Sandwich Nature/ Husman/ Pasta/ Tarallucci/ Tomato Sauce
ReMa-MEDIO AMBIENTE, S.L. (LCA Consultancy, Spain)	5 wine products
CTME (Technology Centre Foundation, Spain)	bottle of red wine
Swedish Institute for Food and Biotechnology	meat, dairy or fisheries product
Primary Food Processors	Starch, sugar, oilseed crushing and vegetable oil refining, or a selection of these
Gallina Blanca Star	Chicken stock cubes
FEFAC	compound feed for terrestrial species and aquafeed
FEDIAF	"Concept" dry and wet pet food products, followed by real products on the market
FERRERO	Lemon Ice and chocolate praline
Mondelēz International	Several coffee products

Source: The European Food SCP Roundtable 2016, p.17

Some members of the SCP Roundtable claimed that not only on the European organisational level, but also the utilisation of the ENVIFOOD Protocol on the individual members states' level of the EU is a significant achievement of their collaboration. The international composition of the SCP Roundtable enabled the collaboration to communicate their knowledge on food sustainability directly and indirectly to individual member states. According to an SCP Roundtable member this knowledge is particularly transferred through several members that represent high level food chain actors, which also bring in individual EU member states (1IE, 3IE).

Since the SCP Roundtable is a predominantly industry led collaboration, the majority of contributions to the understanding of food sustainability is delivered by the collaboration through a food industry lens. According to an SCP Roundtable member the contribution to the body of knowledge on food sustainability is to demonstrate that anti-food industry claims do not show the full context. An example that is put forward by this member relates to the correlation between packaging and food waste. This food and drink manufacturer states:

> "*We [The SCP Roundtable] have discovered that packaging plays a role in avoiding food waste and that banning packaging is not an option to improve the environmental performance of food products overall because, you may remove the impact generated by packaging, but you will create a much bigger impact due to the wastage or losses of the food itself, which is much more impactful. It may be known before, but the very fact that you work together and that you share ideas …*" (1IE).

For other members of the SCP Roundtable the collaboration has not succeeded in delivering true and honest contributions to the understanding of food sustainability. According to a former SCP member, a key problem of the collaborative platform is that *"[…] providing concrete output failed because the communication of sustainable food was shelved and this is what is not going to be proceeded*" (1GE).

The PSF's contribution to the understanding of food sustainability is partially focused on small and mid-sized companies. Thus, the PSF aims to "*involve all the small and middle sized companies […], make information on sustainability publicly available and to think in a much broader and bigger scale*" (3GU).

This development was particularly triggered by the experience of some PSF members in the previous Courtauld Commitment that focused on packaging and the impact on carbon emissions. Some members felt that to have an honest dialogue and understanding of food sustainability, a wider context had to be applied (5IU, 7IU, 3GU). It was important for the members to not fall "*into a slight trap in following what everybody else was doing*" (7IU), such as focusing on only certain environmental aspects within the complex food sustainability debate.

According to some PSF members, the collaborative and work of the PSF on food sustainability has the benefit of strengthening each members' organisation internally. The transparency between each member and particularly between competitors enabled each member to be more certain about their efforts in being more sustainable. Members claimed that this in turn has an impact on the organisation's overall efficiency (2IU, 3C, 2GU).

More specifically, the PSF contributes to the understanding and exploration of food sustainability through their various projects. Three examples for that are:

- The Product Sustainability Forum Knowledge Base
- Resource Map
- Pathfinder Projects

The Product Sustainability Forum Knowledge Base collates selected:

> "*information from a wide selection of sources, such as government and private sector-funded scientific research, product life cycle assessment and footprinting studies, market and CSR reports and insight, peer reviewed journals, eco-labelling and environmental product declarations and case* studies" (WRAP 2016a).

The PSF Resource Map focuses on 50 grocery products and their environmental hotspots. These hotspots describe correlations between certain environmental metrics of a grocery product and environmental impacts, such as greenhouse gas emissions associated with the product (Product Sustainability Forum 2014a). In correlation to these hotspots, members of the PSF have internally developed the term 'Reduction Opportunities' which they called ROs. These ROs were action plans and specific topic guides for anyone within the supply chain. According to a PSF member, these topic guides acted as "*a discussion document that organisations can take back and talk to colleagues about things like voluntary sustainability standards or engaging suppliers in sustainability thinking*" (3C). The Path Finder Projects are long term case studies that focus on a specific food or drink product and its value chain. Based on these various case studies, the PSF has elaborated on their findings through reports and presentations. This

is seen by the collaboration as an important contribution to the body of knowledge on food sustainability.

4.4.3 Voluntary Industry led changes with the aim to improve food sustainability

The interviews with members of both the PSF and SCP Roundtable, as well as the document analysis suggested that industry actors have a strong drive to implement industry led changes in the context of food sustainability. These changes were mainly described by the interviewees as a bottom-up approach, with the aim to improve food sustainability. The researcher has therefore selected this theme to elaborate on the research findings that relate to the bigger picture of knowledge impact.

Changes and new practices in the food system that aim to implement more sustainable practices can be indicated through a bottom-up or a top-down approach. A top-down approach can be described as the implementation of new laws and regulations by the government to promote changes in the food system that aim to direct actors towards more sustainable practices. In contrast a bottom-up approach is often a voluntary regulation that is initiated and taken forward by private actors such as industry, NGOs or consumer groups. The interviews showed that a key aspect of the collaborative work evolved around the direct and indirect development of voluntary bottom-up practices in the context of food sustainability. According to a former civil servant "*[…] the reason the industry likes the voluntary action is because they can influence, and this is why they are in the room […]"* (3GU).

Not only the industry, but also the government actors appeared to be in favour of voluntary initiatives by industry actors. According to an NGO representative, the UK government particularly supports the creation and development of industry led collaborative groups, to avoid top-down legislations. According to the NGO representative:

> "*…in the UK, if you can possibly avoid legislations than avoid it and do as much as you can through voluntary measures undertaken by the principle companies involved and seek to make de-risk that volunteerism if you like by looking as interested as a*

> *government should be. But all of those collaborations here in the UK were set up and created on the explicit assumption that legislation should be avoided*" (2C).

A food and drink manufacturer and member of the PSF also shares that idea and states that "*[…] the current government also is more in favour of collaborations and voluntary agreements then steering things through regulations*" (7IU). Interviewees from industry and government representatives believed that the majority of their peers within their collaboration have an honest interest in improving food sustainability (3GU, 7IU, 4IE, 2GU, 1GU). According to a PSF founder:

> "*…industry volunteers to be honest, so if they have absolutely no interest in doing anything that will improve the sustainability of their products and they joined the PSF then they are clearly in the wrong room. So you know they won't come if they don't care. So you tend to find there are people in the room who actually sign up to the goal and they recognise that what we are doing will help them in the long run and properly in the short run, too*" (3GU).

Voluntary agreements are however not always seen as a positive pro-industry approach and some industry members regard such initiatives with caution. According to a food and drink industry representative *"[…] as an industry, retail has to think carefully about when it wants to take on a voluntary commitment and when actually it would like to call for regulations" (8IU)*. To illustrate this statement, the interviewee described an example on potential regulations or voluntary commitments in regard to sugar targets in food and drink products. This example shows that a conflict of interests might occur between different actors across the food value chain, as retailers tend to be neutral towards the introduction of sugar target regulations, whereas food and drink manufacturers tend to be less in favour. The food and drink industry representative stated that:

> "*…the introduction of sugar targets […] that's an area where there is a different opinion between manufacturers and retailers, where they are taking different approaches. But that's an area where the government I think at the moment doesn't have an appetite to regulate, but retailers wouldn't oppose regulations if they were introduced. So sometimes regulations can be helpful and sometimes voluntary approaches more*" (8IU).

Both collaborative platforms have developed a guide or schemes that aims to recruit and motivate actors across the food value chain to participate in voluntary activities. Internally, the members of the PSF and the SCP Roundtable are becoming part of a

voluntary multi-actor agreement through the engagement in various pioneer projects and case studies, such as the PSF's Path Finder Projects. An example for this is the SCP Roundtable's work on communicating environmental performance of food and drink products. This study involved the participation of several food industry members and according to an SCP Roundtable member:

> "*...the conclusion was that we agreed to summarise that we need to have the necessity of a multi-approach and that you cannot put these things [environmental performance] on a package. This was for some of the members of the roundtable something new. The dominating idea was that it (environmental performance) has to be in on a pack and we discovered or even confirmed with a study that there are other ways to communicate then printing everything on to a pack*" (1IE).

Both collaborative platforms studied in this research have a particularly high level of participation from food industry actors, such as Nestlé, Kraft Foods or the Kellogg Company. This in theory implies a wide-ranging impact and influence within the food system. This particularly applies to the SCP Roundtable as a consequence of its international membership and focus. The SCP Roundtable's ENVIFOOD Protocol is directly addressed to actors that are outside of their collaboration (mainly food industry) and includes the message to voluntarily join activities and practices that aim to address food sustainability.

Similarly, members of both collaborative platforms can be motivated through the collaborative work and show more individual efforts in being more sustainable. A PSF member outlined how certain retailers have voluntarily taken initiatives as a result of the collaborative work within the PSF and states that:

> "*Something like [food retailer X] had done last year and I don't know if this resulted directly out of the PSF but it was the same guy that presented it was the same guy at the PSF there and it was part of their broader thinking. They were talking and looking at their risks of their supply chain to climate change and something like 95% of their fresh produce supply chain were at risk and therefore they needed to take action. So that goes back to that collective understanding and insight certainly plays a key point here at the PSF. I also know that [food retailer Y] made a change with their suppliers as a result of the PSF work*" (7IU).

4.5 Summary

This chapter outlined the research findings through four main parts that relate to each of the four research questions. The findings that are presented in this chapter are based on the research data that was gather through interviews and content analysis (see Chapter three). It is important to understand that this findings chapter (Chapter four) is only outlining the findings in a descriptive and 'face-value' manner without any interpretation or analysis. The aim of this chapter is to present the 'raw' data of this research to the reader structured through themes that give the data presentation structure and 'flow'. The presentation of the raw data helps to understand the argumentative process of this thesis and provides evidence to the researcher's argumentation and interpretation at a later stage for the research analysis (see Chapter five). This includes the following summary, as key findings are outlined in an explanatory and descriptive way with the absence of any deeper analysis of interpretation of these findings.

The first part of this findings chapter (Section 4.1) focuses on the motives of actors to participate in a collaboration in the food system. The findings show that particularly food industry actors seek to collaborate on the basis to develop harmonised food sustainability standards. Food industry actors see unharmonised standards and uncoordinated actions of stakeholders as disadvantageous for business interests. Particularly around food sustainability, differences in standards and procedures are seen as burden. Each industry actor has to manage a variety of food sustainability standards, such as standards on environmental protection. At the same time, negative outcomes of unsustainable practises force actors to collaborate more and have a constant dialogue with other stakeholders in the food system. The depletion of resources, such as water put food businesses in an uncertain position in relation to their future business projections. An additional motive for actors to join a collaboration is based on the 'bandwagon effect'. This effect describes a situation where actors are interested in joining a collaboration because of the presence of certain actors within that platform. These can be competitors or government representatives that are of interest for an

actor. Key elements that play a role are the 'fear of missing out' and the desire to be associate with successful and powerful actors.

The second part (Section 4.2) of this research findings chapter elaborates on the mechanisms of collaborative learning and knowledge sharing in the context of food sustainability. Members of both collaborative platforms interact with each other through formal and more informal setups. The majority of interviewees from both platforms stated that almost all activities are within a formal and transparent context. This also included informal setups, such as working lunch meetings or workshops that are kept formal and inclusive. Members of both collaborations believed that activities which are kept formal, official and transparent contribute to the level of trust amongst the members and foster collaborative learning and knowledge sharing. Trust and competitiveness amongst the members of both platforms was described as critical aspect to be aware of, but not seen as a real threat that affects the platform's knowledge sharing and learning activities.

Knowledge on food sustainability was predominantly referred to by the members as non-competitive areas that affect everyone equally. These elements relate also to the stakeholder's concerns that unsustainable practises affect current and future business operations. Since both collaborations are voluntary, the level of trust and the openness to share knowledge is seen by members as strong. Most members of the SCP Roundtable and the PSF described the environment within their platform as a pre-competitive, where competitiveness is present but starts at the supermarket shelf.

The research findings have shown that for many members of the collaborations the key element regarding collaborative knowledge sharing and learning is the presence of a knowledge broker and external experts. Particularly knowledge brokers make complex knowledge more accessible to all members of the collaboration. Individuals that represent a stakeholder tent to have a different background and thus, have different levels of cognitive accessibility to knowledge. The PSF is particularly aware of this potential problem and has therefore contributions from WRAP and external experts. The SCP Roundtable also uses the expertise of external experts to make complex

knowledge more accessible to its members. The SCP Roundtable does not have a neutral knowledge broker, such as WRAP and members are aware that some more complex knowledge will be less accessible for some of their members.

A central method of collaborative learning and knowledge sharing for the SCP Roundtable and the PSF are joint activities on specific case studies. Since some members of both collaborations represent actors along the food chain, it is possible to design and execute studies on specific food sustainability aspects. Such joint efforts are seen by the members as highly efficient in knowledge transfer and learning with a real-world setup. The adoption of online platforms and digital solutions were seen as an important element of collaborative activities and particularly for the organisation and transfer of knowledge.

An overarching theme that was linked to almost all collaborative knowledge activities was the utilisation of digital and online solutions. Members of both collaborations felt that there is a significant potential in using online and digital solution to gather and store knowledge in order to have a more effective collaborative learning process. Advantages were pointed out such as the ability to process large amounts of quantitative data or to have always up to date knowledge. Many online solutions, such as the PSF Knowledge Base were already in place and members were on the one side optimistic about the future but had also some concerns. Some members of both collaborations stated that they feel sometimes overwhelmed from the knowledge availability which in turn leads to less effective learning.

The third part of this chapter focused on the types of knowledge that are predominantly created and transferred within the PSF and SCP Roundtable. The research findings unveiled a strong positivist focus of both collaborative groups on quantifiable 'scientific knowledge'. 'Scientific knowledge' was also often described as quantifiable knowledge that comes from 'hard science' and conducted through experiments by recognised scientific authorities and methods. A second trend was the need to organise and manage already existing knowledge within the food system. Some participants of both collaborative platforms claimed that there is no need to create novel knowledge in the

context of food sustainability as vital knowledge already exists but is undiscovered. This is linked to the need for organisational knowledge on the food value chains. Several interviewees from PSF and SCP Roundtable members outlined the lack of knowledge on relationships between actors within specific food chains. Since most members from both collaborative platforms have a food industry background, knowledge on the nexus of food sustainability and business were highly valued. This in particular relates back to one of the motives for stakeholders to collaborative in the first place (Section 4.1), as unsustainable practises are impacting the economics of the food industry.

The fourth part of this chapter discussed the research findings regarding the knowledge effects and impact. More specifically it was about the knowledge that was created or seen as important by the SCP Roundtable and PSF regarding food sustainability. Both collaborations aim to improve the understanding of food sustainability. This is particularly driven by the perception of the members regarding the lack of harmonisation of food sustainability standards. The recommendations of the SCP Roundtable are predominantly addressed towards industry and government actors, whereas the PSF includes recommendations to a broader audience. Both collaborations aim to have their knowledge as open and accessible as possible to anyone who is interested. It is noticeable from the websites and documents of both collaborations that a wide range of national and international actors are interested in the collaborations. Representatives from the Spanish or Dutch government for example have an observer status within the SCP Roundtable.

Compared to each other, the SCP Roundtable tents to focus on in depth science related knowledge, such as carbon labelling, whereas the PSF aims to give predominantly simple, practical and everyday recommendations to industry and consumers. Both collaborative platforms recommend their knowledge to other actors in the food system and initiate voluntary agreements. These predominantly industry led agreements are mainly between food industry actors. These arguments have on the one side the aim to harmonise food sustainability standards and on the other side enhance sustainable practices on a pre-competitive basis. Members of the SCP Roundtable mentioned as an example of direct knowledge impact the recognition of their ENVIFOOD Protocol by the

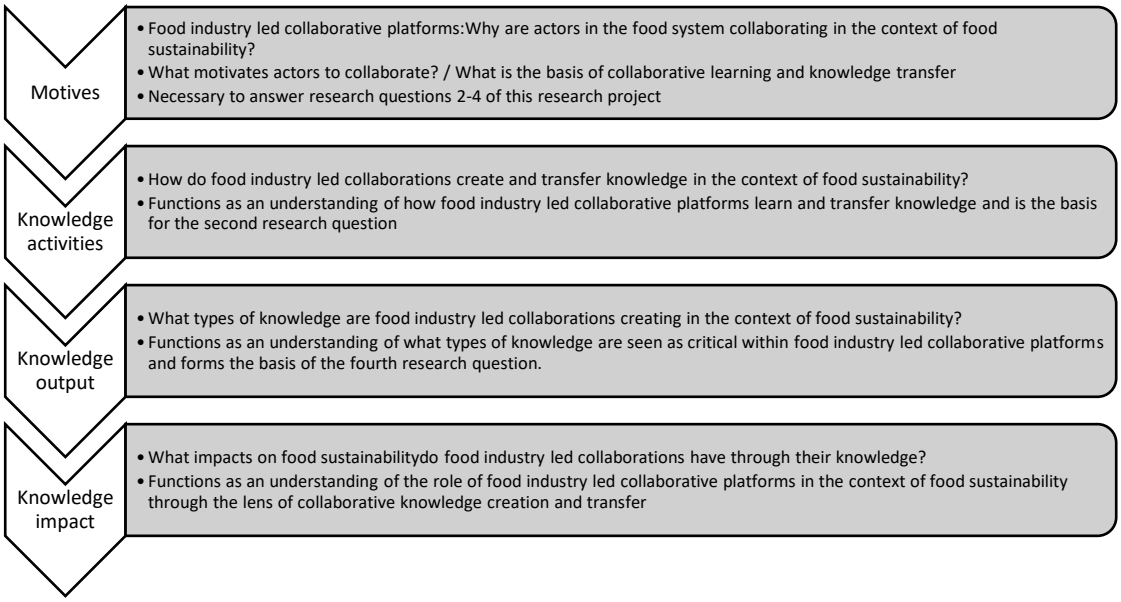
European Commission. The ENVIFOOD Protocol is an industry specific methodology on assessing sustainability within the food chain and was featured and promoted within EU Commission papers and summits.

This section functioned as a summary of the key findings and aimed to help the reader to understand the outcome of the data analysis. This summary is also aimed to help readers to build a bridge between the raw research data and the analysis of that data in the following Chapter five. Each of the key findings that were outlined in this Chapter four will be analysed one by one and put against existing theoretical concepts that were outlined in Chapter one and two. The raw data of this chapter will also be used in Chapter V to justify the researchers own theoretical concepts on collaborative learning and knowledge creation in food sustainability. In other words, the key findings in this chapter are the foundation of the following Chapter V and helps to provide a coherent link from data collection, research findings and the analysis of these findings.

5 Chapter Analysis and discussion

Chapter V is a connecting chapter which revisits the research findings of Chapter four through the academic literature outlined in Chapter one and two. This not only includes the testing of theories, concepts and the hypotheses of scholars, but it also aims to contribute and bridge a 'gap' within relevant academic fields through a critical analysis. Research findings from the interviews and the document analysis from Chapter four are critically assessed against the research questions of this thesis whilst positioned against existing literature. This chapter follows the logical structure that correlates to each of the four research questions (see Figure 5.1).

Figure 5.1 Logical structure of the research questions



Source: Author

In order to maintain a strong analytical structure, this chapter analyses the research findings through the 16 key themes that emerged from the data (see Table 5.1).

Table 5.1 Key research themes in relation to research questions

	RQ1 Themes (Motives)	RQ2 Themes (Knowledge activities)	RQ 3 Themes (Knowledge output)	RQ4 Themes (Knowledge impact)
Theme 1 of RQ#	RQ1/1: **The finding of common and shared understanding of food sustainability**	RQ2/1: **Agenda setting and power distribution**	RQ3/1: **The organisation of existing knowledge**	RQ4/1: **Concrete and direct food policy recommendations**
Theme 2 of RQ#	RQ1/2: **Unsustainable practices and their tangible effects on the food system**	RQ2/2: **Formal vs. informal forums**	RQ3/2: **Organisational knowledge on food systems**	RQ4/2: **Improved understanding and exploration of food sustainability**
Theme 3 of RQ#	RQ1/3: **The 'bandwagon effect' and the presence of respected actors**	RQ2/3: **The role of competitiveness and trust in collaborative learning**	RQ3/3: **The dominance of 'scientific knowledge'**	RQ4/3: **Voluntary Industry led changes with the aim to improve food sustainability**
Theme 4 of RQ#		RQ2/4: **Collaborative joint activities**	RQ3/4: **Knowledge on the nexus of food sustainability and business**	
Theme 5 of RQ#		RQ2/5: **The role of knowledge broker and external experts**		
Theme 6 of RQ#		RQ2/6: **The role of online platforms in knowledge sharing and learning**		

Source: Author

The findings from the interviews and document analysis have confirmed that the PSF and SCP Roundtable actively participate and work on food sustainability challenges, including areas such as climate change, waste, and carbon footprint. At the same time, both collaborations aim to take a more holistic approach in understanding food sustainability. This means both collaborations not only focus on agriculture or consumer rights, but also present themselves as a collaboration that looks at a broader range of themes across the food value chain. This makes the collaboration and its work more likely to be visible in the food system compared to stakeholders predominantly working in niche areas of food sustainability.

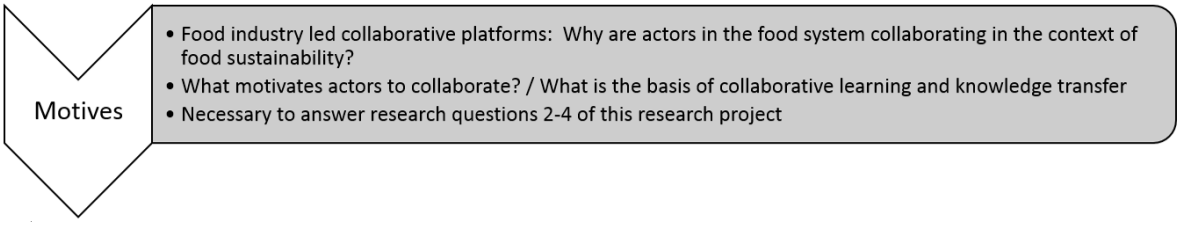
The fact that the membership of the PSF and SCP Roundtable consists of prestigious and well-known actors demonstrates a level of significance and legitimacy of both collaborative platforms in the food system. At the same time, members desire for their

collaborative work to be visible and recognised in the political environment. This means the group is more likely to ensure that the focus on the work is aligned with the general political environment and agenda. This aspect is particularly interesting as the collaborations, the PSF and SCP Roundtable, function in two ways within the food system. On the one hand, they aim to align and conform with the current political environment and agenda to be politically visible. On the flipside, the collaborations have an impact on the political agenda itself through their work and existence. These elements are elaborated in more detail in the coming sections of this chapter.

5.1 RQ 1 Motives of collaborating in the food system

The following section relates to the first research question and aims to explore the motives of actors to participate within food industry led collaborations that work on sustainability challenges (see Figure 5.2).

Figure 5.2 Concept of analysis for Motives



Source: Author

Section 4.1 demonstrated that there are varying reasons and motives that bring different actors across the food system collaboratively together. To understand collaborative knowledge sharing and learning within food industry led collaborative platforms, it is crucial to understand why actors are willing and motivated in the first place to share their knowledge and learn from other actors.

5.1.1 The motives of stakeholders in joining a collaborative platform

Motives can provide insight into understanding what basis actors learn and share knowledge and how their collaborative learning approach and thinking is shaped. Both

the SCP Roundtable and the PSF have illustrated that actors are motivated by three key factors: (a) lack of harmonisation, (b) unsustainable practices that lead to negative tangible effects (short term), and (c) a 'bandwagon effect' (as outlined in Section 4.1).

The lack of harmonisation in the food system concerning food sustainability can be described as the co-existence of multiple standards, certificate, and definitions that relate to food sustainability. This situation is negatively regarded by the food industry and motivates actors to collaborate for more harmonised standards in food sustainability. The co-existence of multiple food sustainability standards is seen by industry actors as a financial burden. The negative economic impact on stakeholders through unsustainable practices (such as the rising costs of raw ingredients) is a second motive that emerges from the research. The third motive can be described as a 'bandwagon effect', where actors are motivated to join and participate within a collaborative platform because of certain actors or stakeholders that are already a member of that platform. On several occasions during the interviews, members of the PSF and the SCP Roundtable mentioned that they joined the collaboration because of the participation of certain actors, such as WRAP or Nestlé. Such stakeholders that are perceived as reputable to follow have a dominant role within the food system, either they are a governmental institution or a large food and drink manufacturer (see Section 4.1.3).

Compared to the literature that is set out in Section 2.1.3 which looks at the motives of actors for joining a collaborative platform, this research has shown that the variety of motives is significantly less diverse than what has been outlined in the literature (Gray 1989; Pellicelli 2003; Fadeeva 2005; Thomson and Perry 2006; Innes and Booher 2010; Huxham and Vangen 2013). Most motives that have been outlined by the literature have a common and unifying core. It is possible to identify certain parallels between the motives from the study and the motives from the literature (see Table 5.2).

Table 5.2 Motives in literature vs motives from case studies

		Motive 1 from study	Motive 2 from study	Motive 3 from study
Motives from study		Lack of harmonisation	Unsustainable practices that lead to negative tangible effects	The 'bandwagon effect'
Motives from literature	1. Conflict solving	X	X	
	2. Response to a crisis			
	3. Decrease environmental turbulence	X	X	
	4. The efficiency argument	X	X	
	5. Economic benefits and risk distribution	X	X	
	6. Advantage in policy bargaining processes			X
	7. Create an innovative and creative environment			

Source: Author

A parallel is indicated in the table with a 'X' symbol where motives from the case studies overlap with motives from the literature. Correlations between study and literature motives were allocated based on comparing each motive from the study individually to analyse wider implications on the collaboration. Those implications were then compared to the motives from the literature.

A deeper analysis of the harmonisation motive (see Sections 2.1.3 and 4.1.1) reveals that a low degree of harmonisation is often the root for other motives that have been outlined by the literature. The lack of harmonisation can be the source of a conflict between different stakeholders, such as a dispute about how to define an organic or sustainable food product. In order to avoid potential conflicts between stakeholders, it can be important for actors that collaborate in the food system to be more assertive and considered than other actors (Gray 1985; Huxham 1996; Thomson and Perry 2006). Through an interpretation of the research findings in Section 4.1, this motive of conflict

solving can be extended by adding the motive of preventative conflict management. This includes the avoidance of misunderstandings, anticipating potential problems, and being collaboratively proactive rather than reactive. Thus, the motive of members to create knowledge that aims to harmonise standards on food sustainability is a way of avoiding current and future conflicts between stakeholders.

The research findings have also shown that harmonisation for many members means to harmonise stakeholder activities to make them more predictable. This was pointed out by food industry actors (see Section 4.1.1) as a way of decreasing environmental turbulence (see Section 2.1.3) and creating a more predictable environment (Huxham 1996, Emery 1965; Trist 1977; Gray 1985; Gray 2003). The perception of the public is that harmonisation is purely technical and evidence-based and can include standards such as harmonised methodologies across different actors within a specific industry. Jasanoff points out that beside the technical component, there has to be a political process and the political acceptance of certain standards that can lead to harmonisation (Jasanoff 2013). Collaborative platforms can play a key role in providing a stage where stakeholders can have that political dialogue and reach consensus. As seen in the research findings in Section 4.1.1, the SCP Roundtable with its strong food industry character appeared to be motivated by the goal of harmonisation. This includes the desire to have a more coordinated and efficient food system within Europe. An example is the harmonisation of assessment methodologies in the food industry through the ENVIFOOD of the SCP Roundtable.

Previous research outlined in Section 2.1.3 elaborates on the motive of actors to be more efficient through collaborating. This includes the benefit of splitting tasks and avoiding the duplication of work for stakeholders that operate in a similar section of the food system (Gray 1985; Huxham 1996; Fadeeva 2005). An interpretation of this efficiency argument in relation to harmonisation reveals its relevance for activities on the administrative and organisational level, such as in standard setting. Previous research on collaborative platforms describes the efficiency argument as a situation where actors collaborate in order to help each other with tangible, labour, or production-oriented tasks, such as the sourcing of raw materials or the production of

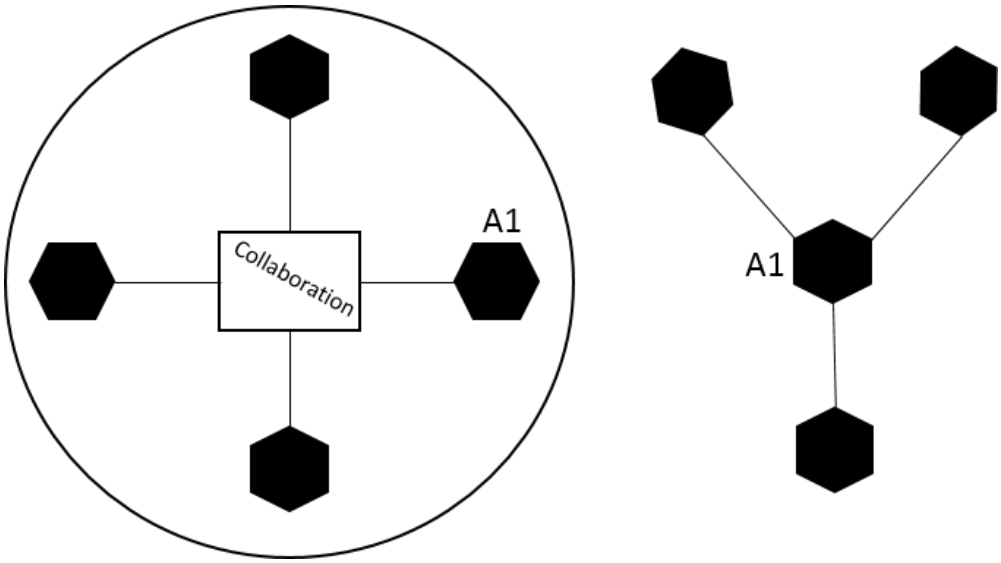
food and drink products (see Section 2.1.3). The research findings show that for industry led collaborations, such as the PSF and the SCP Roundtable, this kind of task sharing appears to be outdated. This might be due to the current agro-industrial food system being efficient on its own where the sharing of tasks already exists.

The PSF and SCP Roundtable have shown that efficiency revolves around the development, testing and justification of certain standards and regulations. This includes administrative, organisational and planning tasks. Thus, collaborative learning and knowledge sharing within food industry led collaborations occur when there is an expectation by members to improve efficiency within mutual administrative processes.

For the majority of PSF and SCP Roundtable members, a strong advantage of being part of a collaborative platform is to minimise individual peer-to-peer meetings and administrative tasks that aim to confirm, reassure and negotiate the nature of the relationships between actors (see Section 4.1.1). Through a collaborative approach, actors can gather at one location on a regular basis to negotiate and confirm consensus within the group.

Efficiency within a collaborative platform becomes clear when comparing two models of a collaborative and non-collaborative environment. Figure 5.3 illustrates a non-collaborative environment with four actors. By considering the perspective from A1 as marked within the Figure, the actor (A1) requires three individual interactions with the other actors. This can range from having three individual meetings at three different locations. The same actor constellation within a collaborative environment demonstrates that actor A1 is engaged in a single process and location that involves the other three actors, therefore showing the efficiency within a collaboration.

Figure 5.3 Collaborative benefit of avoiding additional work



Source: Author

Collaborative platforms aim to create and share knowledge that help their members to develop multi-actor communication skills, including how to implement them in negotiation strategies. The intention for members to collaborate and share knowledge because of harmonisation is ultimately aimed at maximising economic prosperity and reducing business risks for members. The drive for economic benefit and mitigating risk distribution are mentioned in Section 2.1.3 by several scholars in regard to voluntary collaborative platforms (Huxham 1996; Weber 1998; Bizer and Julich 1999; Ingram 1999; Williams 2012).

The research findings suggest that collaborative learning and knowledge sharing within food industry led collaborations mainly occur under the umbrella of maximising profit and minimising economic risks. It is surprising to see that food industry actors are focused on investing time and resources into participating within collaborative learning and knowledge sharing activities despite the food industry being highly competitive. Thus, knowledge on sustainable practices and on the implementation of more sustainability within the food system appears to be good value for food and drink businesses.

The membership of a collaborative platform is attractive for smaller members, both economically and politically, if other more powerful stakeholders are involved. Smaller

members benefit from participating in a collaboration with larger members who have influence and advantage in the policy bargaining process. Within food sustainability arena, a strong position in the policy bargaining process can help food industry actors to promote industry-friendly arrangements and avoid compulsory regulations by the government. The avoiding of legislation through voluntary agreements with governments was also mentioned in the literature review (see Sections 2.1.3 and 2.3.1) as a common motive for actors to join a collaboration. This perspective supports Gray's argument that collaborations can be utilised for the bargaining process between participating stakeholders and the government (Gray 2000). It is a priority for members of collaborative groups to learn and exchange knowledge that helps to create stronger bonds between like-minded stakeholders, including the utilisation of collaborative bargaining power with other stakeholders. The correlation between collaborative learning and political bargaining power is an interesting finding of this research (see Section 4.1.3). Collaborative knowledge sharing and learning in the food system can be regarded as a situation where stakeholders who aim to have a stronger position within political bargaining processes can trade their knowledge and expertise to gain more political bargaining power. On the other side of this trade deal, larger and more powerful stakeholders, such as large food businesses see an advantage in sharing their political and economic power in exchange for niche and specialised knowledge from smaller, more specialised stakeholders.

This motive for food industry stakeholders, might not be the most advantageous concerning the development of a sustainable food system. On the one hand, the collaborative development and promotion of voluntary regulations and harmonised standards can foster the implementation of sustainable practices in the food system. On the other hand, certain efficient and useful practices negatively perceived by food industry stakeholders might be excluded as it is against their business interests. Thus, voluntary harmonised food sustainability standards that have been collaboratively developed and promoted can be less effective in the context of implementing sustainable practices. It is important to note that such activities seem to be highly connected to the type of government and political colour that is currently in power. Conservative and liberal policy makers are more likely to be in favour of voluntary

industry led agreements, whereas left and green governments tend to steer through governmental regulations. Jasaonoff and Hustedt describe the involvement of external actors as strong enough to be regarded as a separate government body in itself (Jasanoff and Jasanoff 2004; Hustedt 2013).

Ultimately, the research findings suggest that the government remains the strongest actor holding the most power when it comes to voluntary industry led agreements and governmental regulations (see section 4.1.3). In the case of the EC, who is the co-chair of the SCP Roundtable, the governmental representative remains in a powerful position on which the members of the collaboration are highly dependent. When the EC started to lose interest in the knowledge output of the SCP Roundtable, the members of the collaboration felt a loss of power as well as a loss of impact on the policy. This research finding is in line with the view of Baumgartner and Jones concerning group-government arrangements. The scholars claim that group-government arrangements can come to an end as a response of changing policies. Such arrangements and relationships are embedded in dynamic processes and cannot be seen as constant (Baumgartner and Jones 2010).

The motives of members whether it is to gain bargaining power in policy making, resolve and prevent conflict or mitigate environmental turbulence, reflect a complexity within food sustainability that continues to expand and become more complex over time (see Section 1.2). The two collaborative platforms, SCP Roundtable and PSF, are examples of what Jasanoff describes as a situation of growing complexity where stakeholders are investigating the place of science, technology and knowledge in society. In the context of this research, this complexity results in a general lack and ambiguity of how and where to place food sustainability related knowledge in society (Jasanoff 2009).

For the PSF, the individual dimension of power exertion appears far more relevant in shaping the agenda of the collaboration compared to the organisational dimension. Individuals that regularly participate within the PSF seem to be personally engaged with the collaboration's work and are to some extent detached from the organisation they represent. Several members of the PSF have pointed out how engaged and enthusiastic

members are, and how they often take the initiative within the collaboration. This involves actions that shape the agenda to drive objectives forward (see Section 4.2.1).

The dominance of power exertion on the individual dimension was so significant that members could not remember immediately the organisation affiliated to the other members. This also aligns with the research finding that even though PSF and SCP Roundtable members were representing their organisation, they actively decided as an individual to invest time and effort into the collaboration. Most of the interviewees from both collaborative platforms were enthusiastic and emotionally attached towards chances, risks and challenges that related to food sustainability (see Sections 4.1.2 and 4.2.1). A reason for this personal interest of the members, beside their professional engagement, might be the impact of the cultural dimension of food. The relationship between individuals and food is so strong that it is almost impossible for the members to participate within a food related collaborative platform from a detached professional perspective. This analysis has shown that within food related collaborative platforms not only larger companies, but also enthusiastic and engaged individuals can influence the agenda.

5.1.2 The inclusion and exclusion of actors through motives and practical barriers

Certain motives for joining a collaborative platform can be the basis of bringing like-mined stakeholders together (see Sections 2.1.3 and 4.1). Common motives for some actors across the food system can be, at the same time, the reason for others to not participate within a collaborative platform. Even if several actors share a specific motive for joining a collaborative group, the motive might not necessarily unify all these actors. The same motive could be seen totally differently by different actors concerning the content and aim of the motive. Thus, the lack of harmonisation in food sustainability might be a common motive (Section 4.1.1), but the detailed content and approach on harmonisation might differ between actors. The idea of having a broad spectrum of actors across the food value chain involved in the creation of policy-relevant knowledge appears to be challenging within food related collaborative platforms. It appears that food industry led collaborations, such as the SCP Roundtable and the PSF, do not

necessarily aim to attract actors along the entire food chain (for example, from ‘farm to fork’).

It appears that food industry led collaborations aim to attract a predominantly homogenous membership that is clustered around specific parts of the food value chain and stakeholders that share similar values. This appears to be relevant in relation to previous research on the potential downsides of collaborative platforms. The literature review in Section 2.1.4 elaborates on the argument of Fadeeva that collaborations tend to deliver superior results due to their consensus-based nature (Fadeeva 2005). This research suggests that actors in the food system are aware of the challenge in finding collaborative consensus and thus aim to collaborate within a homogenous collective that is based on common and unifying motives.

Shared motives are an indicator for actors to associate themselves with collaborative platforms and define its membership. Beside the ideological aspect that defines the cohort of a collaboration, some practical boundaries might even exclude those actors who share the same motives. The ability to be physically away from work and

have the financial resources for travel and accommodation are just some obstacles for these actors. For larger companies these boundaries are likely to be considered very low as they have often dedicated funds and personnel for such activities. Smaller companies tend to have lower budgets and only a limited number of employees. Thus, even though a food industry led collaboration might be open to all sorts of actors who share similar motives, it is only those that have sufficient resources than tend to take part in the collaborative and the creation of policy relevant knowledge.

Both case studies, the SCP Roundtable and the PSF, have therefore an exclusive membership (also see Section 3.5). The collaboration's dialogue food sustainability is predominantly through actors who share the similar motives but are also similar in their organisational structure and size. This unintentional exclusion of smaller actors can have negative implications on food sustainability itself. There is the risk within food industry led collaborative platforms that relevant policy knowledge is created and transferred by an exclusive group of actors in the food system, which is not representative of the real-world food system. Collaborative learning and knowledge sharing can sometimes be specific to an actor's immediate network and does not necessarily encompass the complete food value chain. undermines the PSF and SCP Roundtable's aspiration of being a holistic collective that considers the food chains as a whole. A solid understanding of a value chain is critical for the understanding of food sustainability challenges, as shown in Section **Error! Reference source not found.** of this research. This holistic idea of being considerate of other actors and their activities in the food value chain seems from a members' point of view challenging. From the perspective of individual members, the transfer and creation of knowledge within a multi-stakeholder collaboration appears to be only relevant towards a much smaller network of actors. In comparison to a 'farm to fork' network, the smaller network can consist of actors that are either horizontally on the same level of the food chain or are located in the immediate up- or down-stream.

This questions the effectiveness and authenticity of such collaboration in the context of food sustainability. There is the potential risk that members are less likely to be engaged in knowledge creation and sharing on topics that are outside of their immediate

network. Thus, it is difficult for a food industry led collaborative platform to be truly capable of working on certain themes from a holistic and inclusive food sustainability perspective. Exclusivity appears to be an additional challenge for food related collaborative platforms. Both the PSF and the SCP Roundtable are industry led groups and their membership consists of food industry stakeholders (see Section 3.5). Even though some non-food-industry stakeholders are involved in collaborations, key representatives from other parts of the food value chain such as farmers are not present. It is therefore important to recognise the role of such industry led collaborations; such collaborations can never be a creator or provider of knowledge that relates to food sustainability issues from a holistic food systems perspective. Collaborative groups that are willingly or unintentionally exclusive towards certain stakeholders of the food value chain lack the ability of exploring food sustainability from the perspective of other stakeholders within the food system.

The absence of perspective from other stakeholders appears to be embedded in the work of the two collaborative platforms. An example for this is the SCP Roundtable's working group on non-environmental food sustainability factors (see Section 3.5.1). A pragmatic way of bypassing the lack of certain stakeholder views seems to be compensated through a process of predicting the standpoint of the missing food chain actors. This is accompanied with the input of external experts and the use of secondary sources, such as reports by third parties. Despite this limitation, the PSF and SCP Roundtable are recognised and respected by governments and policy makers. This recognition and legitimacy are evidenced through the involvement of the EC and WRAP in their respected collaborative groups (see Section 4.4.1).

From a pragmatic perspective, the research findings demonstrate that the two collaborative groups aim (un)intentionally to have a manageable number of participants that can work effectively towards a common goal. During the interviews it was explained that having a high number of stakeholders can be challenging in regard to reaching consensus, fully capturing all individual views (see Section 4.2.1). Thus, it is critical to understand that the role of such food related collaborative platforms within food

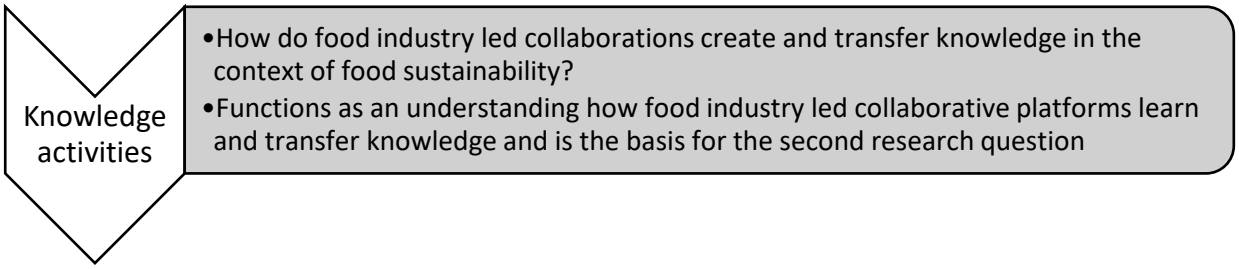
sustainability is likely to be exclusive to those parts of the food system that are represented through the membership of the collaboration.

It appears that food related collaborative platforms are therefore less holistic and are unable to involve and cover all aspects of food sustainability across the entire food value chain. Instead, food related collaborative platforms focus on segments of the value chain. This suggests that a partial focus on the food value chain is actually more of an effective approach in collaboratively discovering and solving food sustainability challenges. The two collaborative platforms SCP Roundtable and the PSF are key representations of knowledge contributors specialised around specific food value chain areas (see Section 4.3). A challenge for representing the entire food value chain can be to identify all actors and recruit them for the collaboration. Even for specific food value chains that appear to be reasonably simple products such as bread, value chain specific actor-relationships and activities can become ambiguous and complex.

5.2 RQ2: Mechanisms and processes of collaborative learning

The following section relates to the second analytical string (knowledge activity) and focuses on collaborative learning and knowledge transfer within food related multi-stakeholder platforms (see Figure 5.4). This analysis aims to answer the second research question.

Figure 5.4 Concept of analysis for Knowledge activities



Source: Author

Based on the data collection through interviews and document analysis (see Section 3.7), this section is organised through the same key themes of Chapter four To answer the second research question of this thesis, this section includes an analysis of the following six themes on collaborative learning and knowledge transfer. These six themes are part of the 16 themes that are used throughout Chapter four and five.

I. Agenda setting and power distribution
II. Formal vs. informal forums
III. The role of competitiveness and trust in collaborative learning
IV. Collaborative joint activities
V. The role of knowledge broker and external experts
VI. The role of online platforms in knowledge sharing and learning

Overall the analysis of the interviews and documents demonstrated that both the PSF and the SCP Roundtable appear to be successful in accumulating the knowledge of their members to a collaborative knowledge pool that is later utilised by its members and external stakeholders (see Sections 4.2 and 4.3). The primary role of such platforms is not only the sourcing and pooling of knowledge, but the collaborative network in which

that knowledge pool is embedded. The PSF or the SCP Roundtable can be seen as an attempt by stakeholder groups to organise and position themselves within a group of other stakeholders that operate in the food system. The core of this positioning process is to create and transfer knowledge that includes important elements such as the collaboration's views, definitions, ideologies and priorities within food sustainability (see also Section 4.4.2). The aim of this positioning is to have an impact within food sustainability that benefits directly or indirectly the members of the collaborative platform.

5.2.1 Agenda Setting and power distribution

The research findings have shown the exploration of hierarchal structures within collaborative structures is essential in understanding power dynamics. Section 4.2.1 has illustrated that certain members within a collaboration can be more dominant in influencing the agenda of the collaboration. This can impact what types of knowledge are created and transferred within the organisational activities of the platforms.

The research data has shown that within food industry led collaborations, maintaining a balanced and equal power distribution between the members is challenging. This became evident when analysing the differences in power distribution between the PSF and the SCP Roundtable. This comparison was conducted based on the responses of interviewees on their perception of power and equality within their collaborative platform. Collating those responses from PSF and SCP Roundtable members reflected two distinctively different distributions of power (Section 4.2.1).

The members of the PSF appeared to be proud of their collaborative structure, as it was perceived as a balanced, equal, and democratic collaboration (Section 4.1). This organisational balance is not something that evolved naturally, rather the members made conscious efforts through implementing democratic, open, and transparent structures into the PSF. The design of the collaboration aims to empower all members by giving equal weight to the opinion of each member and fostering a flat hierarchy during discussion. Individual members have equal rights to speak up and suggest,

criticise, or support an argument during collaborative sessions. Clearly, this has a benefit of designing the agenda of the PSF through a truly collaborative and equal approach. There is, however, a further dimension of the agenda setting within the PSF. It is critical to understand that the PSF is both a follow up collaboration of the past Courtauld Commitment, and a preliminary body for the forthcoming Courtauld Commitment 2025. The agenda of the PSF is based on the themes of the previous Courtauld Commitment and the anticipated aims for the Courtauld Commitment 2025. This brings WRAP into a central position (see also Section 3.5.2). WRAP, the neutral actor and facilitator within the PSF, had that pivotal position in the past Courtauld Commitment and it is going to be the facilitator for the coming Courtauld Commitment 2025.

Even though the research data has shown that the intention of WRAP is to be a neutral facilitator and expert for the members of the PSF, it has also had an essential impact on the agenda of the PSF. Especially in the early stages of the PSF, the activities of WRAP around the organisation of the PSF involved the provision of knowledge and the skeleton outline of the agenda. Even though WRAP aimed to deliver a true and neutral service for the PSF members, it was the key actor that set the first stones of the PSF's pathway (see Sections 4.2.5). This demonstrates that even though a collaborative platform is perceived as an open and democratic environment, in which members can freely create and transfer knowledge, the agenda in which the collaboration is embedded restricts and limits collaborative learning and knowledge sharing. This indicates that the collaborative knowledge activity of members becomes limited to the agenda of the collaboration and excludes other potentially important areas. Even through collaborative agendas might change over time, the root and basis of that agenda is likely to evolve from the previous set agenda reproducing similar mental models that facilitate collaborative learning and knowledge transfer. Compared to a learning environment that has been set up from 'scratch', an existing collaborative platform would in theory be more open to novel knowledge and provide an environment of true creativity and spontaneity.

Through such learning mechanisms, members of the collaboration can have the ability to stimulate their mental activities and explore beyond their usual capabilities of

knowledge creation. The work around food sustainability is especially perceived by some members as an area that is in constant need of creative and innovative energy to unleash alternative ways of problem solving. It is therefore debatable how spontaneous and creative knowledge in these collaborations can be, as this collaborative environment can favour an agenda that reinforces old mental models. This analysis aligns with the theory of Foucault on governmentality and critical theory (Foucault 1977; Foucault 1980). The theory describes a form of power that creates knowledge through social control in disciplinary institutions, such as food related collaborative platforms. This created knowledge becomes internalised by individuals and impacts behaviours and activities, such as collaborative learning and knowledge transfer mechanisms.

This internalisation reinforces cognitive patterns and the use of familiar agenda items and structures within the collaboration. This can influence collaborative learning and knowledge sharing in relation to the development of sustainable systems. The argument for this analysis is based on the theory of a genuine form of dialogue within collaborations (see Section 2.2.5). This aspect has been outlined in Chapter two of this thesis and describes a "*spontaneous and creative, less focused on a prior question and more broadly aims at learning, evolution and action*" (Innes and Booher 2010, p.121). This form of genuine collaborative dialogue is an essential element for the development of sustainable systems. It is therefore debatable whether collaborative platforms that have been formed out of a legacy (such as the PSF) are capable of discovering and transferring effective knowledge regarding food sustainability.

The power distribution within the PSF has a balanced and democratic nature. Interviews with PSF members have shown that the ability to shape the agenda is perceived as a process open to all members equally (Section 4.2.1). This indicates that the PSF is internally a balanced, fair and democratic collaboration, where the political and economic size of a participant does not necessarily reflect its power in shaping the collaboration's agenda. This is a contrary position the SCP Roundtable, where economic and political size correlates to the power within the collaborative platform (Section 4.2.1).

The SCP Roundtable exerts power and shapes the agenda from a more inter-organisational perspective. This means that political and economic power often translates into a situation where only certain actors exert power within the collaborative platform. The research data has shown that on the one side, particularly within the SCP Roundtable, larger food and drink industry actors are perceived by the members as dominant actors within the collaborative platform. On the other side, members that have political power and perceived significance, such as the EC or NGOs were also perceived as critical and powerful actors in shaping the agenda of the collaboration (Section 4.2.5). The SCP Roundtable, as well as the PSF are trying to ensure a balanced and equal group dynamic, despite the involvement of some politically and economically dominant actors. This demonstrates that there is an overall awareness of the potential credibility loss when a minority of dominant stakeholders dominate the agenda setting. This is particularly evident when the majority of SCP Roundtable members feared the loss of legitimacy and credibility after the departure of an NGO. The fact that members of the SCP Roundtable felt that their collaboration had lost its social credibility through the departure of the only NGO demonstrates the political and social significance of NGOs within food industry led collaborations.

This particularly reflects the benefit of being recognised and respected by policy makers and other actors within the food system (also see Section 4.1.3). It can be vital to have a broad spectrum of actors included that have a strong political, social or economic importance in the food system. When forming a food related collaborative group, it appears that a trade-off has to be made in regard to political visibility and social credibility. To be recognised by policy makers, the members of a collaborative group have to shift their agenda to some extent towards the preferences of current governmental bodies. In the case of the SCP Roundtable, when such a governmental body is part of the collaborative cohort, this actor has an advantage in exerting power. Similarly, to gain social credibility, a collaborative platform aims to have an NGO in its membership, which in turn empowers the NGO to shift the agenda in favour.

Despite the absence of certain stakeholders in collaborative platforms, a potential reason for that recognition of such collaboration is the perceived importance of the

collaboration's existing membership. Larger food and drink manufacturers in particular gain their legitimacy through their dominant strategic status within the food value chain and their economic strength. In the case of the SCP Roundtable, it has been shown that certain food industry actors were more powerful than other members and were significant in shaping the collaboration's agenda (Sections 4.2.1 and 4.2.5). This might be described by the literature and some civil society actors as a one-sided collaboration that is controlled by a minority of stakeholders from the food industry. At the same time, the research findings have also revealed that this dominant role of certain food industry actors within collaborative platforms does not automatically translate into a negative or disadvantageous experience for other, less dominant members. Members with more experience and expertise see themselves as having the responsibility to lead a collaboration and be consciously involved in shaping the agenda. The intention of such actors can be the provision of stability and to guide s towards emerging and critical food sustainability themes. Large food and drink manufacturers that have been working in the food system for more than 100 years for example, can be a significant asset to a collaboration in identifying key areas within food sustainability (also see 3.5). At the same time this experience and expertise of certain members from the food industry is also, to some extent respected and admired by some members with less experience.

This perception was also shared by members within the SCP Roundtable who acknowledged to some extent the expertise and track record of certain members and were open to the idea of being led by those more experienced members. In this regard, food related collaborative platforms might be unique compared to other fields of collaboration. Within food related collaborative platforms, agendas might be shaped by one or two more powerful actors (see Section 4.2.1), which in turn impacts what types of collaborative knowledge is transferred and created. At the same time, it seems to be a preferred learning environment for some members to be led by more powerful and experienced actors, and to take part within a fully or partially set agenda.

The leading role of some more dominant members within the collaboration appears to have a positive effect on other members. Smaller and less experienced members felt motivated, inspired and some members even felt a sense of security and reassurance. If

reviewed on an individual level, the acknowledgement of the thinking of more powerful actors can decrease the insecurity of members of being 'wrong' regarding a trend in the food system and the potential of 'going the wrong way' (Section 4.1.3). This aspect can in turn enhance the learning and knowledge transfer activities of some members, as they are embedded within a collaboration where they feel more comfortable in exploring ideas within an agenda theme they perceive as right. Thus, some members consciously participate within collaborations that include experienced actors. At the same time this habit can lead to a loss of diversity when smaller actors do not feel confident in expressing their niche knowledge and expertise.

The analysis in this section has shown that power exertion and the ability to shape the agenda within food related collaborative platforms can be complex and multi-dimensional (see Section 4.2.1). The findings have shown that the organisational and individual dimensions are co-existent within the membership of collaborative platforms. This differentiation between the organisational and the individual level has been drawn from previous literature that points out the importance of distinguishing different levels within collaborative platforms (Lewicki 2002; Gray 2003; Ansell and Gash 2008; Clarke and Roome 1999; Huxham 1996; Innes and Booher 2010; Lozano 2014**;** Lozano 2008).

Table 5.3 illustrates two scenarios that relate to organisational and individual dimensions of a collaboration. A scenario (Scenario 1) within the organisational dimension revealed that a food related collaborative platform can have a flat hierarchy and members perceive the collaboration as democratic and equal regardless of their economic, strategic, social or political capabilities. The research findings have shown that within a collaborative platform with a flat organisational hierarchy (Sections 4.1 and 4.2.1), the individual dimension appears to be more dominant. This scenario (Scenario 1) within the individual level reflects enthusiastic members that have strong personal interests and are perceived as detached from the organisation they represent. Such individuals are keen to guide other members and drive the agenda forward. This, however, might not always be the case and other forms of power distribution such as a flat organisational hierarchy and individual dimension of power distribution. Scenario 2 relates particularly to the analysis of the SCP Roundtable and demonstrates a strong

organisational dimension where organisations exert power and shape the collaboration's agenda. Their legitimacy is gained through their perceived dominance within certain capabilities, such as politically or economically. For this research a strong organisational dimension of power exertion correlates with a weak individual dimension. This scenario (Scenario 2) of the individual dimension is characterised through individuals that respect the authority of other members (organisational and individual) and are comfortable in being guided. In Scenario 2, collaborative learning and knowledge transfer within an individual dimension occurs inside boundaries that are predominantly shaped by more dominant and powerful members.

Table 5.3 Dimensions of power and agenda setting

<table>
<tr><th>Collaborative dimension</th><th>Scenario 1</th><th colspan="3">Scenario 2</th></tr>
<tr><td rowspan="3">Organisational dimension</td><td>Democratic and equal power distribution between members</td><td colspan="3">A number of actors hold more power over other members</td></tr>
<tr><td>Political or economic size of a member does not relate to their power and ability to shape the collaboration's agenda</td><td colspan="3">Political or economic size and the strategic positioning of a member relate to their power and ability to shape the collaboration's agenda</td></tr>
<tr><td>All members all equal in regard to power and agenda setting</td><td>Economic, strategic and historical capabilities benefit

Food industry actors</td><td>Political capabilities benefit

Governmental bodies</td><td>Social capabilities benefit

NGOs</td></tr>
<tr><td>Individual dimension</td><td>Individuals have a personal interest and exert more power than other members

Enthusiastic and engaged individuals have a leading role in shaping the collaboration's agenda

Individuals are to some extent detached from the organisation they represent</td><td colspan="3">Individuals participate as an observer and learner and admires expertise and experience of other individuals or their organisation

Individuals exert less power than other actors and are comfortable to be guided by other members with key capabilities</td></tr>
</table>

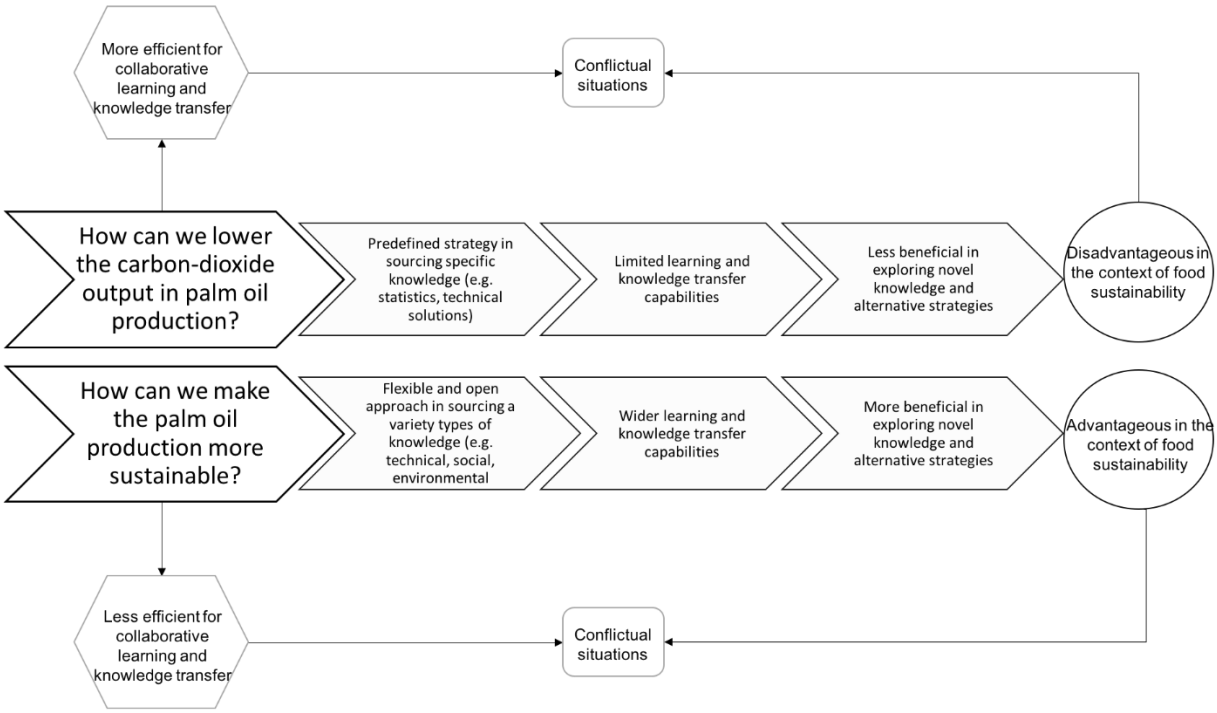
Source: Author

This confirms existing literature which distinguishes between the individual and organisational dimensions (see Sections 2.2.2 and 2.2.3) within collaborative activities (Senge 1991; Crossan et al. 1995; Lozano 2008). This analysis also adds to the evidence from literature that certain dimensions within a collective can play a stronger or weaker role and determine the outcome of collaborative activities, such as agenda setting. This understanding is vital for this research as the agenda is a determining factor for the learning and knowledge activities of the collaboration and consequently its knowledge output. At the same time, the analysis of power between the organisational and individual level within the collaborative platforms also emphasise differences between individual and organisational learning and knowledge sharing. Thus, collaborative learning can be an individual process, where an attendee is engaged as an individual within the collaboration. The organisational dimension of learning within collaborative platforms refers to a process where a company, NGO or governmental body learns through knowledge acquisition and enhances their body of knowledge and capabilities.

Not only is the use of familiar topics within the agenda setting process critical for collaborative learning, but also the differences between a fixed and flexible agenda. A fixed agenda can help to maintain a clear structure within the collaboration and allow it to channel its workforce towards a dedicated goal. Because of a diverse membership and often limited time resources, a set agenda with clear goals appears to be advantageous. This, however, can also have a negative effect, as a set agenda within a collaboration is likely to steer the members' cognitive capabilities towards particular topics and themes. This can have a negative impact in relation to food sustainability, as many topics that could be beneficial for the development of sustainable models are either excluded or less considered by the collective. A more flexible agenda can widen up the members' capabilities to also develop learning and transfer knowledge outside the topics and themes of the agenda. Having the ability to collectively think outside the pre-defined themes can enhance creativity. Creativity, in turn, is an important element for the development of sustainable models (see Section 2.2.3) and food sustainability since it helps to create alternative and innovative strategies (Innes and Booher 2000; Feldman et al. 2009; Innes and Booher 2010). Figure 5.5 features two examples of a set

and a more flexible goal within a collaborative platform and the implications on collective learning and knowledge transfer in the context of food sustainability.

Figure 5.5 Collaborative learning on food sustainability and the role of agenda



Source: Author

The first situation has a predefined and focused strategy on carbon-dioxide output. This can lead to a limitation in collaborative learning, as members are focused on one specific solution. In contrast the second situation implies a wider approach in finding a solution to the production of sustainable palm-oil. This in turn can lead to more creativity and flexibility within collaborative learning.

Predefined and set goals can lead to a situation where the attention of the collaboration is drawn towards certain solutions and knowledge (also see Sections 4.2.1 and 4.2.2). Set goals can be linked to certain expectations in answering these goals and thus, can define the knowledge transfer strategy of the collaboration, including the desired goals. Goals that are more loosely defined can also allow the exploration of solutions through multiple learning and knowledge transfer strategies. On the other side, the disadvantage of loose goals and an unstructured agenda are difficulties in managing the collaboration and being inefficient in having concrete outputs and results. An agenda that is too lose

can lead from a pragmatic perspective to a situation where members lose track and experience difficulties in being focused. This especially relates to the collective exploration of knowledge towards a unified and common goal. This reveals a conflictual situation within food related collaborative platforms that work on sustainability. Flexible goals lead on the one side to an advantage for exploring knowledge in the context of food sustainability, but at the same time this advantage correlates with an inefficiency of exploring that knowledge from a pragmatic standpoint. Analogous to this, clearly defined goals enhance the capabilities of the collaboration to explore knowledge, but that knowledge is less beneficial in the context of food sustainability.

The research findings have shown that the majority of PSF and SCP Roundtable members prefer defined goals that are embedded in the collaboration's agenda and linked to clear time frames (see Section 4.2.1). The clear intention of those members is to have a strong structure within the collaboration that helps to keep all members together and channel the work. A reason for this preference is that members are more familiar with environments where there is a set agenda and clearly defined goals, since they encounter these circumstances in their daily work. From a pragmatic perspective of a member, the benefit of learning and transferring knowledge within an organised environment outweighs the potential benefit of exploring alternative types of knowledge outside the set agenda and goals. Based on interviews, it also appears that members are aware that a food related collaborative platform should be adaptable and flexible in discovering solutions for food sustainability. Thus, even though the model in Figure 5.5 illustrates two opposite poles and a black and white scenario, the data collected in this research reveals the applicability in real-life.

5.2.2 Formal vs. Informal knowledge forums within collaborative platforms

The members of both the PSF and the SCP Roundtable have revealed that they have been learning and exchanging knowledge within formal and less formal collaborative environments (Section 4.2.2). The analysis of the research findings showed that most members prefer a predominantly formal collaborative environment that includes informal elements. An example of this is that members of a collaboration participate in

line with a set time schedule for a meeting but are able to turn up in casual clothing. Informality that relates to secretive talks behind closed doors are against the core idea of transparency within collaboration. The way collaborative formality is perceived by the members appears to be solely of an organisational and structural nature. This means that formality is related to elements such as a predominantly fixed time schedule, agenda, formal location or formal dress code. Contrary to that, collaborative informality is related to elements that differ from formal aspects, such as casual clothes, flexible time-schedule or the usage of creative materials.

The difference in having a formal versus a more informal collaboration is likely to have an impact on the collaborative learning and knowledge transfer environment. This relates to existing literature from Clarke and Roome on different formal and informal setups of collaborative platforms, which they refer to as network locations (Clarke and Roome 1995). The research findings confirm their findings (see Section 2.1.5) that network locations play an important role within collaborative platforms when working on sensitive and complex issues.

To answer the second research question and to understand how food related collaborative platforms learn and share knowledge, it is critical to elaborate on role of learning environments within a collaboration. For this analysis it is important to understand that most of food related collaborative platforms, such as the PSF and the SCP Roundtable, are likely to consist of different actors who come from different learning environments. This relates on the one side to their professional and on the other side to their personal learning environments. In food related collaborative platforms, these learning environments influence collaborative learning and knowledge sharing. This can be illustrated through an example by putting two members of a food related collaborative platform side by side. One member of the collaboration is a manager from a large food and drink manufacturer, who is predominantly involved in formal environments at work. This environment is, at the same time, the environment in which the manager is predominantly confronted with knowledge that relates to food. Another member from the same collaboration is from an NGO that represents farmers

and also used to be a farmer. Thus, there can be differences in the working and learning environment between an NGO representative and a manager.

The environment and circumstance in which an individual predominantly learns might lead to a situation where his or her cognitive capability of knowledge creation and transfer are mainly coined to that familiar learning environment. Thus, a collaboration between actors that operate in the same area of the food value chain, such as retailers, are more likely to share a common learning environment. A more diverse collaboration with actors from different areas of the food value chain, such as retailers and farmers have a more heterogenic and diverse learning environment. This can be regarded in two ways in relation to collaborative learning and knowledge sharing. First, a collaboration that includes members who share the same learning environment might feel (unknowingly) familiar and comfortable to learn and exchange knowledge amongst each other. In return, a learning environment that is perceived by members as more comfortable or beneficial can lead to more efficiency regarding the collective knowledge output. Secondly, a collaboration where members share the same learning environment can also lead to a loss of diversity in how knowledge is collectively created and transferred. The rationale behind this argument is that members are not confronted with a new learning environment that might develop their capabilities in collective learning and knowledge transfer. The consequence from this can be that critical knowledge is not created or transferred within the collective, as the discovery of these types of knowledge are outside the prevalent learning environment. The real disadvantage of this becomes evident when considering any collaborative platform that focuses around food sustainability.

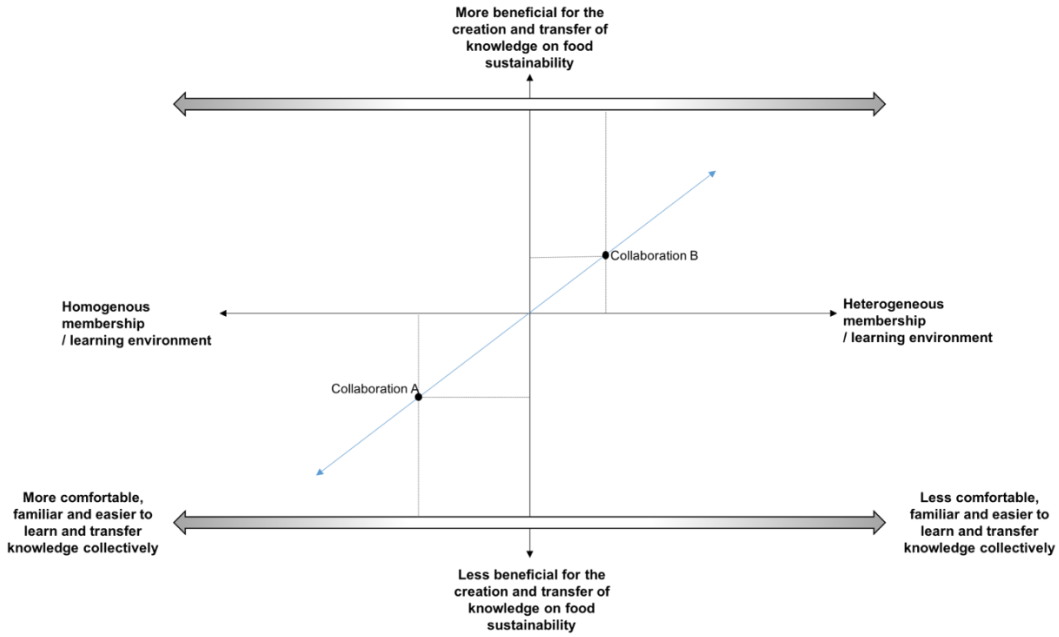
The literature review and the previous section regarding power distribution and agenda setting have illustrated that it is a critical ability for a collaborative platform to create and transfer a broad and diverse range of knowledge when working on sustainability (Sections 1.2 and 1.3). Thus, collaborative activities on food sustainability, require knowledge and input of actors that work across the food value chain. A predominantly heterogenic membership is more likely to create diverse knowledge that is beneficial in

work relating to food sustainability (Aiking and De Boer 2004; Gupta 2004; Lang et al. 2009; Lang and Barling 2012; Lang et al. 2001).

This confirms the work of other scholars that have pointed out that a shared culture within a collaboration can limit the ability to learn more. This deficit in learning may occur, as members may be unwilling to adapt mechanisms that are outside of a certain belief system even though they may be more efficient (Nahapiet and Ghoshal 1998; Inkpen and Tsang 2005). Rayner (2012) has described this aspect as 'uncomfortable knowledge', where certain knowledge that stays in contrary to a certain belief system or mindset is excluded from a knowledge pool (Rayner 2012) (also see Section 2.2.8).

Thus, a more homogenous membership is more likely to create less diverse and less beneficial knowledge in relation to food sustainability. Food related collaborative platforms that work on food sustainability appear to be in a constant act of balancing membership diversity and efficiency in collective learning and knowledge transfer. This circumstance is illustrated through the central diagonal in Figure 5.6. Food related collaborative platforms such as collaboration A or B in this example can be located on this diagonal depending on their membership diversity.

Figure 5.6 Collaborative learning environments in food sustainability



Source: Author

The bottom and top arrows in thick illustrate how comfortable / familiar members are in terms of collaboratively learning. Towards the left side of that arrow members are more likely to be comfortable and familiar with the collaborative learning, whereas the right side illustrates a less comfortable learning environment. These thick bottom and top arrows correlate with the level of homogeneity / heterogeneity of the collaboration, which is illustrated in the figure through the horizontally located arrow in the centre. Towards the left side of that horizontal centre arrow the members of a collaboration a more homogenous in their overall background. An example for this could be a collaboration that consists of members from large food and drink retailers. Towards the right side of that arrow members of a collaboration are more heterogenous based on differences in their overall background. An example for this could be a collaboration that consists of members from small scale farmers, large food and drink manufactures and environmental activist groups. The arrow that is located vertical centre illustrates how beneficial the created knowledge is regarding food sustainability. The more upwards on that arrow the more beneficial certain knowledge is for food sustainability, due to the diversity of knowledge. Whereas more downwards on that vertical centre arrow, the knowledge output is less beneficial concerning food sustainability. All these outlined arrows in Figure 5.6 illustrate an 'environment' in which food related collaborations can be located in regard to their learning activities within food sustainability. The positioning of a collaboration within that environment results in a location along the centre diagonal arrow. Depending on where a collaboration is located along that centre vertical diagonal it is possible to determine how effective a collaboration is likely to be regarding the creation of knowledge on food sustainability.

The two examples A and B on that diagonal illustrate two extremes of collaborations. Collaboration A in the lower left corner can be described as a collaboration that mainly consists of a homogenous membership and is therefore more likely to be comfortable in learning and creating knowledge collaboratively. At the same time this knowledge output from collaboration A is less likely to be beneficial for food sustainability due to the lack of knowledge diversity. Members that are similar are likely to think in similar patterns and create knowledge that is less controversial or interruptive and therefore

less beneficial for food sustainability. Example B in the upper right corner illustrates in contracts a more heterogenous collaboration that allows knowledge creation through members that have differences in their thinking and therefore are likely to create more diverse forms of knowledge. Even though this knowledge is more beneficial for food sustainability, at the same time due to the differences in learning it is likely that the collaboration is less comfortable and effective in providing concrete knowledge output.

Figure 5.6 illustrates that the level of diversity correlates with the ability of the collaboration to learn and transfer knowledge, but also gives an indication on how beneficial the knowledge output is likely to be for food sustainability. The basis of this collaborative learning environment analysis confirms existing literature which states that learning within organisational structures only occurs through individuals (Section 2.2), but individual learning does not necessarily imply collective learning (Simon 1991; Innes and Booher 2000; Lozano 2008).

This concept can help to analyse and understand the structural dimension of food related collaborative platforms and how the level of heterogeneity/homogeneity influences collaborative learning on sustainability. Existing literature also supports this form of structural analysis, as collaborative learning can be described as a combination of experiences and ideas of individuals or groups (Doppelt 2009; Lozano 2014). In particular, the existing model of collaborative learning through dialogue, where members are able to move on from vague ideas towards more complex judgments, can benefit from the additional insights on collaborative homogeneity/heterogeneity (Innes and Booher 2010).

As an example, Figure 5.6. features the two collaborations A and B, which are different in their membership diversity. Collaboration A is compared to collaboration B, more likely to create knowledge that is beneficial for food sustainability. At the same time, collaboration A will have more difficulties in learning and creating knowledge compared to collaboration B based on the differences in learning environments. This rationale in relation to knowledge creation, food sustainability and homogeneity/heterogeneity of membership becomes even more evident when focusing on the actual knowledge

output of collaborative platforms. A good perspective on this aspect is outlined in Section 5.3.2 concerning collaborative knowledge specific to the organisation of the food value chain.

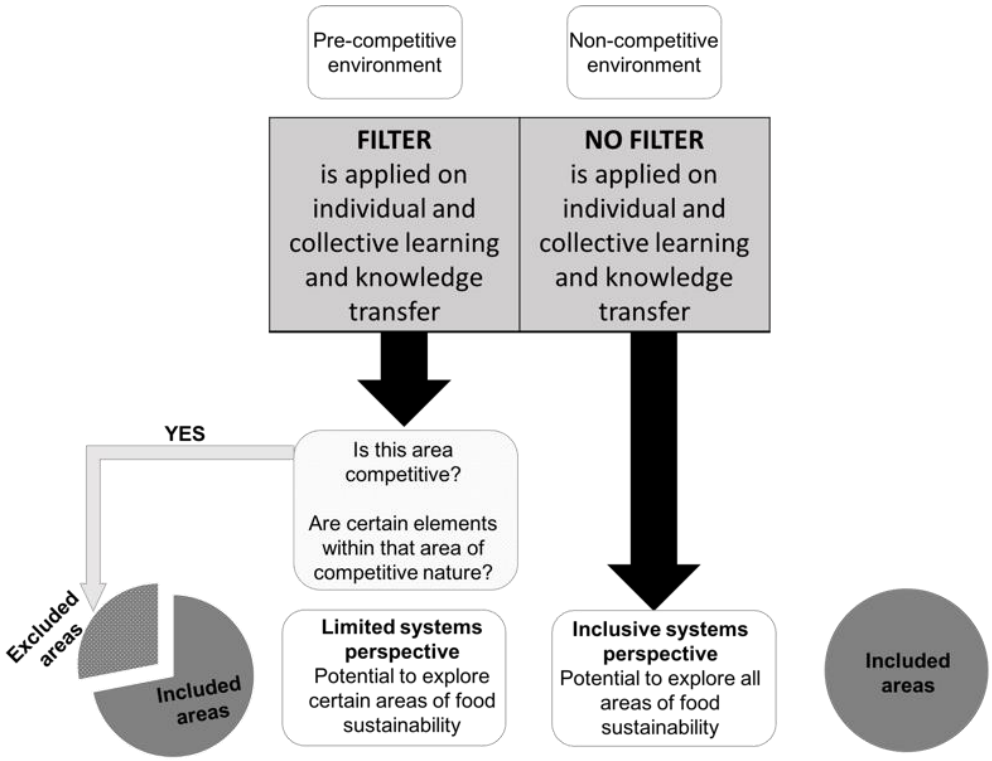
5.2.3 Competitiveness and trust in collaborative learning and knowledge transfer

Several authors have pointed out that industry led collaborative platforms, such as the PSF or the SCP Roundtable, have by nature a competitive mentality regarding inter-partner learning (Hamel 1991b; Lei et al. 1997; Tsang 1999; Simonin 2004). Within food sustainability and in relation to food related collaborative platforms, this research has shown that the role of competitiveness in collaborative learning is not that simple (Section 5.2.3). This section is divided into two parts and elaborates on how pre-competitiveness influences collaborative learning and knowledge transfer processes in the context of food sustainability. The first part of this section analyses the relationship between competitiveness and the limitation of members to create and transfer knowledge from a food systems perspective. The second part of this section focuses on the actor level of competitiveness within food related collaborative platforms and how certain members have a disadvantage in learning and knowledge transfer compared to other members.

The analysis of the research findings revealed two major elements in relation to the role of competitiveness and trust within collaborative learning in the context of food sustainability (Section 5.2.3). First, voluntary food related collaborative platforms are perceived by members as spaces that are predominantly pre-competitive. Secondly, in relation to knowledge sharing, this pre-competitiveness particularly relates to food sustainability challenges that are considered as universal and of concern for a broad spectrum of stakeholders in the food system. These challenges are pre-dominantly in the field of environmental sustainability that affect areas such as raw food products and livestock. Considering that environmental sustainability is only a section of food sustainability, this research has shown that knowledge concerning other food sustainability areas appears to be lacking. This becomes particularly evident since there are other critical social, health and economic aspects within food sustainability. It is however important to note that this statement relates particularly to food industry led collaborative platforms, since this research has focused on two industry led collaborations.

The focus on solely pre-competitive topics and the exclusion of more competitive areas within a collaboration can also lead to a collective mental barrier. Figure 5.7 illustrates two contrary scenarios of a pre-competitive and non-competitive collaborative environment and the impact on learning and knowledge transfer in the context of food sustainability. The selection of these two scenarios is based on the interviewee's responses where a clear distinction was drawn between a non-competitive and pre-competitive environment within collaborative activities. In addition, the two scenarios are also in line with current existing literature that emphasises the importance of the role of competitiveness (Section 2.1.6) within collaborative learning and the implications on the learning outcome (Tsang 1999; Huang and Yu 2011; Lozano 2008; Hamel 1991a). A purely competitive environment has been purposely left out from the model in Figure 5.7, since it is against the nature of a voluntary collaborative platform.

Figure 5.7 The role of knowledge and competitiveness in the context of food sustainability



Source: Author

A pre-competitive environment within a collaboration not only creates a mental barrier, but also functions as a filter that constrains members' learning and knowledge transfer capabilities. Members are consciously and unintentionally in a constant mental process of distinguishing between competitive, pre-competitive and non-competitive areas. The

consequence of this is that members invest their mental and cognitive resources for the filtering process rather than for the actual learning and knowledge transfer process. This leads to the circumstance where the collaboration has restricted capabilities of learning and knowledge transfer in addition to the exclusion of potentially critical food sustainability themes. Thus, from a food systems perspective a pre-competitive environment in a food related collaborative platform only allows for the exploration of certain aspects of the food system. Compared to a hypothetically complete non-competitive collaborative environment, members do not apply a filter during their learning and knowledge transfer processes and thus are more focused on the actual act of collective learning with a 'free' mind. This forms an ideal situation from a food systems perspective, since members can explore and discover knowledge from all areas and be able to learn and transfer knowledge from a variety of perspectives.

From the perspective of an actor, a key statement of many members was that competitiveness in the food system predominantly starts at the supermarket shelf and less at other sections of the food value chain. Interpreting this statement from an actor perspective, within food related collaborative platforms, particularly food and drink retailers and their immediate up and down-stream, actors are more likely to have a competitive mind-set during collective activities. Food and drink retailers are vital actors in the food system and an important stakeholder within food related collaborative platforms. This means that there is an imbalance within the collaboration regarding competitiveness, as some members are more strongly affected than others. This in turn can influence collective learning and knowledge transfer.

As pointed out in the literature chapter of this thesis, a competitive character within a collaboration can lead to asymmetrical learning structures, where some members have a disadvantage in learning and knowledge sharing (Section 2.1.6 and 2.2). Asymmetrical learning particularly refers to the situation where members regard the collaboration from a selfish and competitive perspective rather than a truly collaborative effort (Hamel 1991b; Simonin 2004). In food related collaborative platforms this asymmetrical learning can lead to a lack of knowledge regarding the food and drink retailer sector and a disadvantage when working on food sustainability. Considering food sustainability

from a systems or farm to fork perspective, the lack of knowledge in a particular segment of the food system can impact the effectiveness of a collaboration's food sustainability work.

Members across the food system of both the PSF and the SCP Roundtable saw the retail sector as the key are of competitiveness within the food system. At the same time, competitiveness in the food system was perceived by the members as something not expulsive to the food and drink retail sector. The reason for this might be that even if competitiveness starts at the supermarket shelf, members are aware that this competitiveness affects a broader segment of stakeholders in the food system (see Figure 5.8).

Figure 5.8 Competitiveness in the food and drink sector and its impact sphere



Source: Author

Thus, competitiveness might affect even a larger group of members within food related collaborative platforms, since the modern agro-industrial food system is a space of highly inter-dependent actor activities and relationships. For example, a supermarket chain that sells chocolate and is in a competition with other supermarkets will aim to offer the product for a lower price, or at least for the same price as its competitors. This pressure to lower costs will be passed on to other actors across the food chain, such as distributors or manufacturers, and will ultimately lead to a domino effect. Thus, in a

wider context, competitiveness has a high relevance in food-related collaborative platforms and affects members based on their positioning within the food and drink retail sector.

Both the thematic and the perspective of actors on competitiveness within food related collaborative platforms revealed that knowledge in relation to food sustainability can only be partially explored by members. This raises the question of whether it is even possible to collectively explore knowledge in the context of food sustainability. It seems challenging to have a multi-stakeholder collaborative platform in the food system that is completely free of competitiveness.

5.2.4 Joint collaborative activities

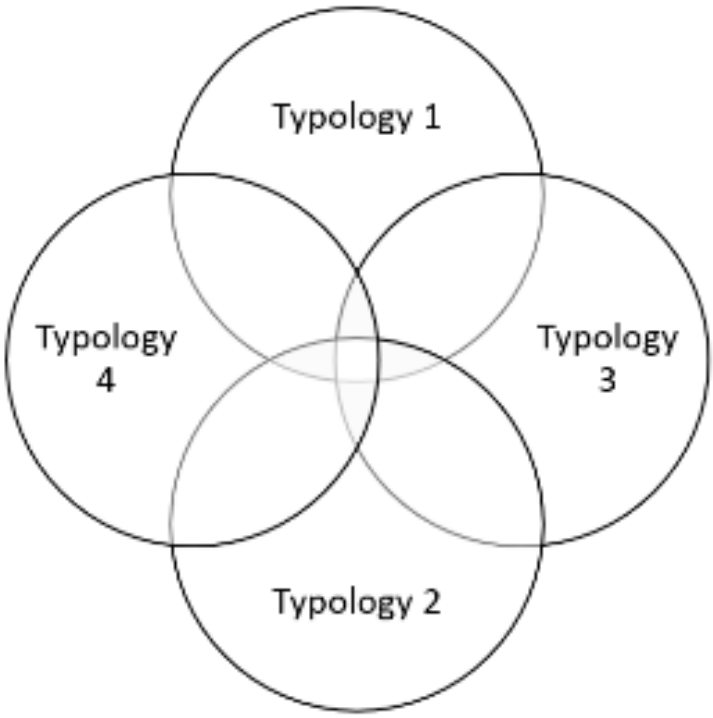
The active form of learning and knowledge transfer through joint collaborative case studies relates back to Lozano's learning typologies which have been outlined in the Section 2.2.4 (Lozano 2014). This indicated that mainly practical and real-life learning typologies have a high relevance for collaborative multi-stakeholder platforms in the food system. The majority of learning and knowledge transfer processes within food related collaborative platforms occur predominantly under an active rather than passive process (Section 4.24). This means that most members of a collaborative platform are aware of activities that aim to enhance their pool of knowledge and they are actively seeking those activities. In collaborative environments, the active and conscious side of learning and knowledge creation appears to be stronger than passive and non-anticipated learning typologies (Section 2.2.4).

This preference for more pragmatic learning processes is likely to be based on the fact that food related collaborative platforms work predominantly on tangible real-world problems (also See Sections 4.3.3, 4.3.4 and 4.4.1). These evolve around different aspects of the food value chain, such as farming or food production. Industry led collaborative platforms such as the PSF and SCP Roundtable are likely to have an easier access to practical real-world learning and knowledge transfer typologies through their routine daily work in the food system. Thus, Lozano's experimental and inquisitive

learning typologies are applicable concepts for collaborative platforms in the food system. Both of these typologies focus on learning and knowledge transfer through real-life problem solving. The experimental typology describes the challenging of mental models by linking abstract concepts to real life situations. The number of abstract concepts is however, kept to a minimum as the emphasis of such collaborations is limited to the practicality and the ability of embedding those concepts into the current existing food system. Lozano's inquisitive learning typology appears to be the most relevant for food related collaborative platforms since it describes the development of new processes and methods and the questioning of current existing models (Lozano 2014). It is important to note that in relation to the agro-industrial food system, the questioning of current existing models does not drastically lead to the questioning of the food system itself. For food related collaborative platforms, this means that their created knowledge can help to implement sustainable concepts within smaller sections of the food system, such as the banning of certain pesticides (also see Section 1.2). However, larger changes that affect the food system from a systems or multi-dimensional perspective are more challenging to achieve with the inquisitive learning typology. Such changes are, for example the banning of all pesticides from the food system with the aim of having a positive impact on overall health and environment.

The research findings revealed that within food related collaborative platforms it is difficult to have a clear distinction between the experimental and the inquisitive learning typology (2.2.6 and 4.3). Some abstract thinking appears to be always involved as part of the learning process. These particularly include the development of new processes and methods that can be applied to real life scenarios. It is therefore important to understand that for collaborative platforms within the food system, the typologies of Lozano are not clearly distinctive and need to be regarded as overlapping and cross-cutting learning processes that can occur in parallel (see Figure 5.9).

Figure 5.9 Cross-cutting learning typologies



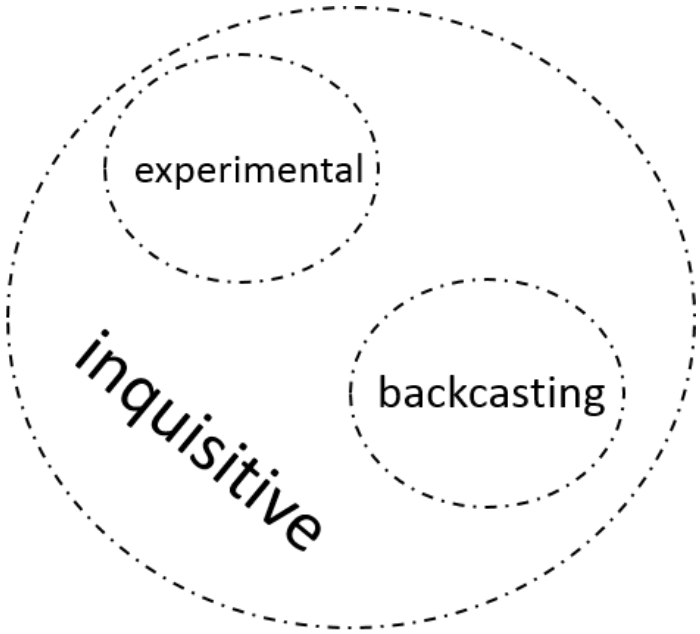
Source: Author

When working in the field of food sustainability it is inevitable for food related collaborative platforms to internalise learning mechanisms that allow the creation and transfer of knowledge that is applicable to current and future scenarios. A key aspect of sustainability is the ability to maintain the current food system for future generations. This includes the mental processes of stakeholders and their ability to think ahead and use anticipative learning processes.

The interviews with both members of the PSF and the SCP Roundtable revealed that a large portion of their learning and knowledge transfer is aimed towards the development of sustainable concepts for potential future scenarios (Section 5.3.4). This particular focus on future scenarios relates to the learning typology of 'backcasting' coined by Lozano (Lozano 2007; Lozano 2014). This typology is similar to experimental and inquisitive learning and describes the challenging of current circumstances with the particular aim of creating an ideal future scenario. This process includes the mental process of anticipating potential future scenarios in the context of real-world food system scenarios. This anticipation was expressed by members of both collaborations as the foreseeing of future chances and challenges within food sustainability.

Considering the complexity of the food system and current food sustainability issues, this foreseeing appears to be a difficult task for the members of a collaborative platform. External factors such as climate change, terrorism and changing governments are difficult to foresee. This means collaborative outcomes of the 'backcasting' learning process often appear to be speculative and less trustworthy. In relation to the collaborative learning this means that members are aware of potential future challenges and chances, but predominantly focus on the creation and transfer of knowledge that is provable under current and immediate circumstances. Figure 5.10 illustrates how the more practical inquisitive learning is the dominant typology within food related collaborative platforms and how more abstract and anticipated learning typologies are predominantly considered within the existing agro-industrial food system.

Figure 5.10 Learning typologies of collaborative platforms in food sustainability



Source: Author

Beside the different learning typologies that can potentially occur within food related collaborative platforms during joint activities, a second critical aspect relates to the differences between members in their learning and knowledge transfer capabilities. Joint activities such as case studies are presented by food related collaborative platforms as a predominantly collective effort of planning, executing and analysing. Particularly, PSF Pathfinder projects have shown that many of these case studies are conducted collectively with WRAP and certain food industry actors (Section 4.2.4). A

deeper analysis in relation to collective learning and knowledge transfer reveals an imbalance between members of food related collaborative platforms. It appears that not all members are involved in all activities equally in joint case studies. In most cases only certain members that have the appropriate infrastructure and financial resources are conducting the actual case study. Thus, certain learning experiences, such as 'learning by doing', learning through mistakes or failure are confined to only a smaller group of members. A closer look at those members reveals that predominantly economically large members, such as global food and drink manufacturers, or national supermarket chains are conducting case studies within their own organisational structures. This has an impact on creating differences between individual members regarding learning and benefiting from the collective case study. This becomes especially evident when considering the different stages of a collaborative case study and the differences in learning. This differentiation is between individuals that have actually conducted the case study and other members that learn more passively, as they have not actively conducted the study (see Table 5.4).

Table 5.4 Learning stages in collaborative case studies from an actor perspective

Stage at joint case study	Collective learning and knowledge transfer	Individual learning of certain members
	Symmetrical learning	Asymmetrical learning
Having the idea for the case study	+	+
Planning of case study	+	+
Conducting the case study	+	+++
Analysing the case study	+	++
Having positive consequences from the case study		+++

+ =Level of involvement/benefit from learning and knowledge transfer

Source: Author

Most of the case study stages are part of the collaborative learning and knowledge transfer process. This means that it is a collective effort in designing, planning or analysing the outcomes. For certain stages however, such as learning through the practical operation of the case study, members that are actively conducting the case study and providing their resources and infrastructure are likely to have an advantage in learning compared to other (more passive) members of the collective. An example of

this asymmetrical learning is the PSF Pathfinder Project Milk/Chocolate Value Chain (Sections 3.5 and 4.2.4). This project was a case study conducted through the food and drink manufacturers Nestlé and First Milk. The ability to learn from the stage of analysing the outcomes of a case study are stronger for certain members through their practical on-the-ground experience. The consequence of this is that other members who do not have this first-hand knowledge learn through the filtered perception of other, more practically engaged members. This not only creates an asymmetry in learning within the collaborative platform, but also puts certain members in a more powerful position over others in the context of prioritising certain knowledge.

It is important to note that this is not necessarily negative for all collaboration members. This research has also revealed that a key motive of some members for joining a collaborative platform is their recognition of other members as authorities and respected actors. Because of this motive, members of a food related collaborative platform can also feel comfortable in the role of a student, since they consciously seek knowledge from those members with more experience and economic success. It can be in the interest of the collaboration and its members to use resources and the infrastructure of more economically stronger actors for a collaborative case study to distribute risk. Minimising the economic risk can also allow members to learn and transfer knowledge free from pressure and anxiety. This can lead to a situation where members feel more motivated to view problems from alternative perspectives or suggest unconventional and creative solutions. This analysis has a lot of parallels to some of the key motives that have been laid out in the literature regarding the motives of actors for joining a collaborative platform (Section 2.1.3). These are in particular the economic benefits, risk distribution and the creation of an innovative and creative environment (Gray 1989; Huxham 1996; Huxham and Vangen 2013).

On the one side this leading role of certain members can distribute the overall financial risk for the collective and can allow economically smaller members to be part of a project that is usually outside their economic scale. On the other side, conducting collaborative case studies through the infrastructure of large global actors can benefit food sustainability on a bigger scale. From an agro-industrial perspective, larger

members, such as international food and drink manufacturers are responsible for a large proportion of food supply globally. Thus, the improvement of processes and practices within the organisational structure of such actors can have a larger impact on food sustainability globally.

Within joint collaborative case studies, the learning and knowledge transfer abilities of members are significantly shaped by those members that have been practically conducting the study. This appears to be problematic, as predominantly economically larger members with sufficient infrastructure are leading the case studies. Furthermore, knowledge that is gained from such case studies might be limited in its applicability to smaller actors and their food production lines. Thus, even though a food related collaborative platform defines itself as an equal or balanced collective, through a leading role in joined case studies, actors that already hold a strong position within the food value chain can extend their influence in shaping the knowledge output of the platform.

5.2.5 The role of a knowledge hub and neutral actors

The data collection revealed that neutral actors, such as WRAP or the EC, play a key role in the learning and knowledge transfer processes of the collaboration (Section 4.2.5). A neutral actor in the context of this research can be understood as an individual or organisation that acts as a facilitator, mediator, neutral expert or is responsible for administrative tasks within a collaborative platform. The investigation of the neutral actors within the PSF and the SCP Roundtable were particularly interesting, as they demonstrated two opposite positions. WRAP and the EC played a different role in the collaboration's learning and knowledge transfer capabilities. The role of WRAP within the PSF was a strong facilitator and expert in the field of food sustainability, including overall support from almost all members. Even though WRAP was perceived by most members as a neutral actor, it is important to note that no actor can truly be neutral since even trying to be neutral is a position itself, as this neutrality is based on certain values. The expertise of WRAP in food sustainability functioned within the collaboration as a knowledge-hub. A knowledge-hub in this regard is an actor that has a large repertoire of knowledge and is able to process complex knowledge from the collective

and individual members. The aim of a knowledge-hub is to provide knowledge and make it comprehendible to all members of the collective. This puts WRAP into a critical position within the learning and knowledge transfer processes of the PSF, as being a knowledge-hub also means to be a filter, processor or censor of knowledge. Interviewees of the collective outlined how WRAP would help to make sense out of large data files or would censor certain knowledge to protect sensitive data. Even though WRAP's intention is to be neutral and support the knowledge creation of the PSF for food sustainability, it plays a significant role in how the collaborative learning environment is set up and how knowledge is being processed. Thus, the role of a neutral actor that acts as a knowledge-hub within a collaboration entails certain risks and advantages (see Table 5.5). The presence of a neutral actor that functions as a knowledge-hub can cause certain knowledge to be lost or weakened. This can lead to authentication problems in relation to the content and meaning of certain knowledge obtained through the process of analysing and filtering. This is not necessarily a conscious act by the neutral actor, but more unintentional by trying to protect sensitive content or entangle the complexity into more plain language.

Table 5.5 Risks and benefits of a neutral knowledge hub

	Risks of a neutral knowledge hub within a collective	**Benefits of a neutral knowledge hub within a collective**
Perspective on censorship	Knowledge get censored	Sensitive content, such as personal information can be protected.
Perspective of authenticity and accessibility	Content of knowledge gets changed and loses the creator's meaning.	Complex content can be made accessible to a larger cohort.
Perspective on individualism and accessibility	Members' ability to create knowledge is limited through adaptation or imitation of the knowledge hub's knowledge management (golden standard).	Large amounts of knowledge can be processed easier through expertise and resources of a knowledge hub.

Source: Author

The processes of learning, analysing and filtering knowledge are mental process that are unique to an individual (Section 2.2). This can include the way someone organises knowledge or processes knowledge through preferred conceptual lenses. Similarly, a

knowledge hub, such as WRAP has a unique way of processing and analysing knowledge. The risk within a collaborative platform could be that the individual ability of members to learn and processes knowledge is shaped by the knowledge-hub. This is achieved through adaptation or imitation of the knowledge management and organisation preferences of the knowledge-hub. Thus, members might consciously or unintentionally aim to adapt their preferences in learning and knowledge processing towards a 'golden standard' that is defined through the neutral actor that also acts as a knowledge-hub (Section 4.1.3 and 4.2.5). This might lead to the loss of creativity and diversity within the collaborative platform in relation to different ways of exploring and transferring knowledge. Members might get into the habit of censoring their thinking. This can include a process of excluding and weakening the content of knowledge that they perceive as too complex or inappropriate for the collective. The danger for a collaboration is that the collective creation of knowledge occurs predominantly through a standardised process that lacks individuality and creativity (Section 2.2.3). This is critical for collaborations that work within food sustainability, as a loss of diversity can lead to weak capabilities of exploring effective solutions.

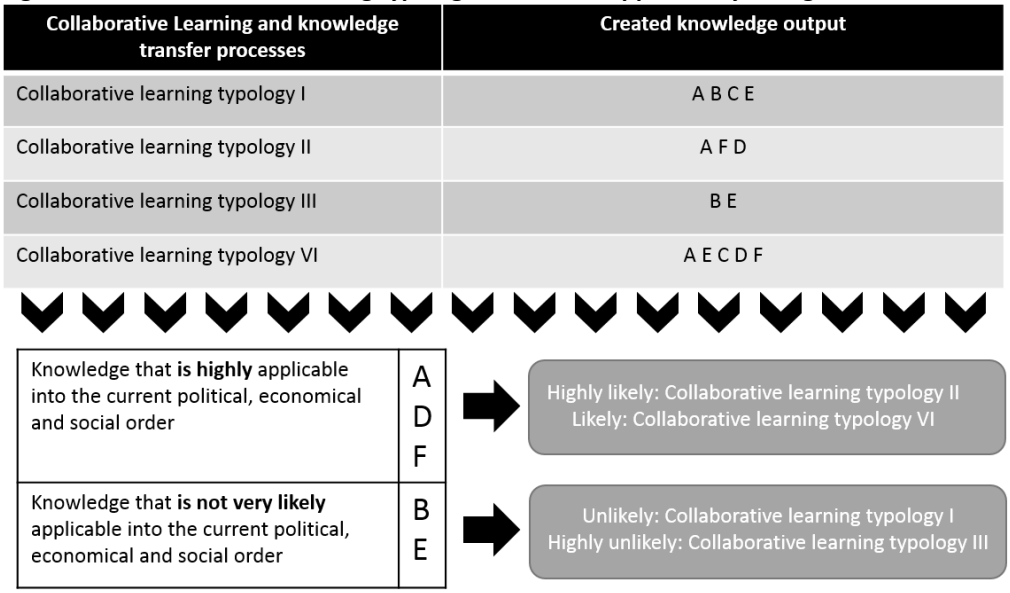
A closer analysis of the research findings also revealed a better understanding of how this 'golden standard' of collective learning and knowledge processing becomes evident. A neutral actor who functions as a knowledge-hub, processes knowledge in a way so that knowledge becomes more accessible to members within the collaboration. The preferred process in the case of WRAP was through a predominantly quantitative, plain scientific and generalised language. This position appears to be coherent when considered against some of the literature that has been laid out in Chapter two and the perception of the interviewees regarding quantifiable and scientific learning environments. Knowledge that consists of data and information, such as statistics or graphs, was considered by the members of PSF and SCP Roundtable and within literature (see Section 4.3), to be universal and easier to transfer than other forms of knowledge (Spek and Spijkervet 1997; Liebowitz 1999; Innes and Booher 2010). This 'scientific knowledge' within food related collaborative platforms in the context of food sustainability is set out in detail in Section 5.3.3.

The data collection of this research in relation to the SCP Roundtable and its co-chair (The EC) reflected a different setup, compared to the PSF, and relationship between the neutral actor and the members of the collaboration. The EC played a more active role setting the agenda and ensuring success of the SCP Roundtable. The ideal scenario for the SCP Roundtable was to develop ideas and methodologies that are picked up by the EC and are beneficial for stakeholders that are represented through the members of the collaboration. This was particularly evident as members stated that the biggest success of their collaboration was when the EC recognised the ENVIFOOD Protocol as an appropriate method and guidance for evaluating food sustainability in the agro-industrial food system (see Section 3.5 and 4.4). Thus, the SCP Roundtable aims to produce content that is applicable to the already existing organisational structure of the EC. This dependence can lead to a loss of diversity in relation to collective learning and knowledge transfer processes. This is different from the relationship between the PSF and WRAP, as it also has the potential to lead to a standardised approach of collaborative learning and knowledge transfer. The SCP Roundtable aims to ensure integrity within already existing approaches and methods of the EC. Thus, the thinking and learning of members is intentionally or unintentionally focused on being aligned with those standards. This might have the potential to create a standardised way of learning and knowledge transfer, since there is a defined aim of how the knowledge output should look. Food related collaborative platforms, which see themselves strongly embedded and connected to an existing order, might suffer a loss of creativity and diversity within their collaborative learning. This existing order can be set by an overarching authoritative body, such as a government or industry standards.

This intentional or unintentional desire of collaborative platforms to be aligned and compatible with an already existing order appears to be a logical and unavoidable consequence. Particularly, for those collaborations, such as the PSF and SCP Roundtable, that aim to implement their idea of food sustainability through impacting governmental bodies and food industry. Therefore, members of food related collaborative platforms aim to do both by creating knowledge that is appropriate and of interest to current trends, whilst being able to apply that knowledge into already existing organisational structures. Food related collaborative platforms that work in the context of food

sustainability appear to learn and transfer knowledge through an already defined and familiar approach (also see Sections 4.2.2 and 5.2.2). Especially the collective work on food sustainability from a 'farm to fork' approach requires the collaboration to recognise existing organisational procedures of the food system (political, social and economic). Figure 5.11 illustrates this relationship between collaborative learning typologies and the level of knowledge comparability to current political, economic and social orders.

Figure 5.11 Collaborative learning typologies and their applicability to organisational orders



Source: Author

Learning typologies in this context relate to different collaborative learning and knowledge transfer processes and are defined as collaborative learning typologies I to VI. This model suggests that certain learning typologies create certain knowledge outputs, which are illustrated in Figure 5.11 as knowledge A to F. Food related collaborative platforms that aim to have an impact on the food system might see the need to get into a mind-set and thinking that allows them to create knowledge that is highly applicable to the current political, economic and social order. These highly applicable knowledge forms are symbolised as A, D and F, whereas knowledge that is not very applicable is referred to as B and E. Consequently, certain learning typologies might be excluded (consciously or unintentionally) by the collaboration since they are unlikely to produce impactful knowledge.

This section has illustrated how neutral actors can function as a point of reference and a point of reassurance for the collaboration and its members. Even though this relationship appears to be neutral, the neutral actor can have a critical impact on the collective learning and knowledge transfer processes. Section 5.3 illustrates in more detail what types of knowledge are predominantly created within food related collaborative platforms that work in the context of food sustainability. These knowledge forms are also elements of what is considered by stakeholders of the food system as suitable to current political, economic and social circumstances.

5.2.6 The role of digital online platforms in knowledge sharing and learning

The data collection of this research has shown that food related collaborative platforms that work in the context of food sustainability make use of digital and online platforms for their learning and knowledge transfer activities (Section 4.2.6). Digital online platforms are referred to in this research as a broad spectrum of online media, such as emails, cloud storage solutions or the usage of any form of digital online and offline storage of information. Within collaborative platforms, such digital online platforms (DOP) are used for three aspects of collective learning and knowledge transfer.

- Communication and exchange
- Knowledge storage and access (internally)
- Access to external knowledge pools (externally)

Firstly, digital online platforms are a tool of communication and exchange between members of the collaboration and external experts, particularly through email services and online video communication. Secondly, an online platform can be a virtual location where knowledge, such as statistical datasets are stored and accessed by the members. Third, a DOP can provide a way for the collective and its members to access external knowledge pools which are not part of knowledge repertoire of the collaboration, such as descriptive stories from online blogs or statistics from EUROSTAT.

When interviewing the members of the PSF and SCP Roundtable, the majority expressed their confidence in and enthusiasm for using DOP. Only a minority of interviewees either did not mention the importance of DOP in relation to collaborative learning and knowledge transfer or gave the impression that they are sometimes technically challenged. There was a large disparity between highly enthusiastic and supportive members of DOP and others less interested in the usage of DOP for their learning and knowledge transfer activities. This suggests an imbalance between members of a collaborative platform in relation to their learning and knowledge transfer capabilities based on the differences in their use of DOP. This asymmetrical learning refers to a situation where some members learn faster than others (Hamel 1991a; Simonin 2004). With the rapid development of technology and the replacement of physical content such as paper to digital forms of documentation, most of content within collaborative platforms appears to be processed through DOP. Consequently, this will require members to be highly technically literate to participate in the learning and knowledge transfer activities of the collaboration. In food related collaborative platforms, such as the PSF or the SCP Roundtable, this requirement did not seem to be causing a problem, since all members had a certain level of familiarity using DOP.

The danger however within multi-actor collaborations in the food system can be the exclusion of certain actors of the food value chain that have minor or no capabilities of using DOP. As a consequence, the collaboration might not get exposed to the knowledge pool of such actors and thus, have a disadvantage in creating knowledge. The exclusion of certain actors from food sustainability, such as local farmers, can lead to the creation and transfer of less authentic and useful knowledge within the collaboration. In most cases however, such stakeholders are likely to be represented in collaborative platforms through a group or an individual with sufficient capabilities of using DOP. It is important to note that a true and authentic representation of knowledge from other actors through a third party might not be fully possible and can still lead to the exclusion of certain knowledge.

A second critical point in this section relates to DOP that are used to store and access a knowledge pool that is internal or external to the collaborative platform. The ability to

have an almost unlimited space of online storage can enable food related collaborative platforms to have on demand geographically independent access to large amounts of knowledge through a highly structured and organised system. This element can become particularly relevant when considering the work of the collaboration on food sustainability. To find the best solutions and to implement more sustainability into the food system, it is vital to have access to as much knowledge on that food system as possible. This aspect was confirmed through the interviews, when members of the PSF and SCP Roundtable pointed out that DOP can help to make large and complex amounts of knowledge on the food system accessible to groups and individuals that work on food sustainability. For some members, the technical revolution and the ability to store and access large amounts of knowledge was seen as a turning point to having a systems approach in implementing more sustainability into the food system. The ability to have highly accurate and up to date knowledge, such as live satellite images of water levels can enable collaborative platforms to learn and transfer knowledge more effectively and lead to knowledge outputs of high relevance to the food system (also see Section 4.4.1). The utilisation of DOP can make it possible for actors in the food value chain to contribute to the knowledge pool instantly while being geographically flexible. This allows food related collaborative platforms that lack internal knowledge on certain aspects of the food value chain to learn and transfer knowledge through the input of external knowledge of other large stakeholder groups in the food system.

This research has revealed that some members and experts expressed that the technical abilities of knowledge creation and transfer through DOP are not utilised to their full potential within food related collaborative platforms. This shows that even though the technical capabilities of learning and knowledge transfer are highly advanced and seem to be beneficial for the development of sustainable concepts within the food system, the actual utilisation by most stakeholders in the food value chain is not as advanced. In relation to collaborative platforms in the food system, this can be related back to the potential circumstance that not all members have a high level of technical literacy and the access and that the usage of certain DOP can be affiliated to high costs.

The utilisation of DOP for collaborative learning and knowledge transfer in the context of food sustainability can also have a disadvantage for the collective's knowledge activities. The danger can be that members of the collective feel overwhelmed with the amount of knowledge available to them and can lose their focus or get lost in details and nuances. This might result in the creation of highly complex knowledge that has a low level of applicability to real-world scenarios in the food system. Food related collaborative platforms consist of members that are humans, who have a certain cognitive limit to store and comprehend knowledge. This human cognitive limitation questions whether it is even possible to use the full potential of DOP for individual and collaborative learning purposes. Interviews with PSF and SCP Roundtable members have also revealed how existing DOP have in some cases been forgotten or even lost track of due to the large amount of knowledge that gets onto the virtual platform. One interviewee described an example how a system has been forgotten that measures air and soil quality on farms, even though it has automatically and instantly been transmitting to a DOP. In a similar manner, members of both collaborations gave the impression during interviews that they sometimes lose track in email conversations and often find it difficult to distinguish between important and less important content. This state of being overwhelmed from the vast amount of knowledge can lead to disadvantages in collaborative learning and knowledge transfer. Members of a collaboration might find it challenging to identify knowledge that is relevant because of the vast availability of seemingly endless knowledge in virtual space (also see Section 2.2).

This section has shown that the utilisation of digital online platforms within food related collaborations in the context of food sustainability is a curse and a blessing at the same time. On the one hand, food sustainability is complex and messy. The use of DOP can help to collect, structure and make knowledge about food sustainability more accessible and organised. This advantage appears to be overwhelmingly strong, including a constant progression through technical developments. Thus, collaborations can benefit from DOP by accumulating knowledge more effectively and creating knowledge that adds to knowledge that is already in existence. This suggests that food related collaborative platforms have the advantage of creating novel knowledge that makes use

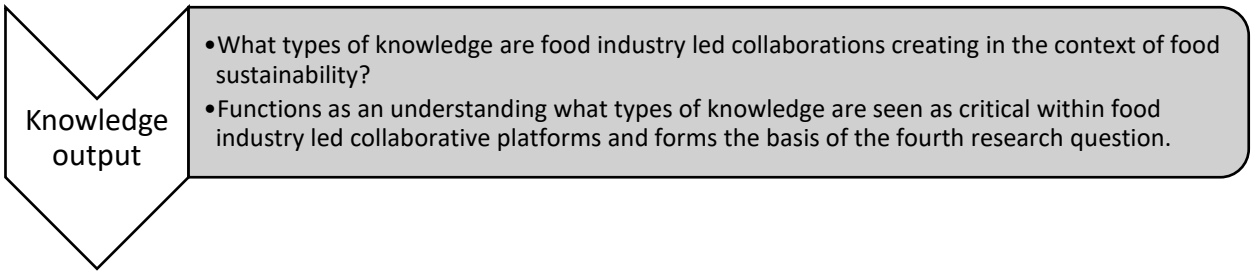
of already existing knowledge and lowers the risk of duplication. On the other hand, DOP can have a negative impact on collaborative learning and knowledge transfer processes, as the amount of knowledge and technical capabilities required to use them are overwhelming and can even increase the existing complexity of the food system's knowledge pool. Food related collaborative platforms might be in a balancing act of making the appropriate usage of DOP in their learning and knowledge transfer activities. This includes an approach that allows the collective to utilise most of the benefits associated with DOP. At the same time, the usage of DOP can reach a limit for a collaborative platform through the complexity they can add to collaborative learning and knowledge transfer.

DOP in the food system are also relevant to the type of knowledge that is seen as critical by members of food related collaborative platforms. Section 5.3.3 of this research elaborates on the correlation between the importance of 'scientific knowledge' for food related collaborative platforms and the adaptation of the food system towards technocratic and digital systems of Industry 4.0. This development towards a digital society is likely to have implications on the types of knowledge used and communicated.

5.3 RQ3: Types of collaborative knowledge in food sustainability

The following section is an analysis of the research findings that relate to knowledge that is predominantly created and transferred within food related collaborative platforms in the context of food sustainability (Sections 2.2 and 4.2.). This section answers the third research question of this thesis and relates to knowledge output (see Figure 5.12). Thus, all forms of knowledge that are part of the knowledge output of food related collaborative platforms are the result of the collaborative learning and knowledge transfer processes, which have been outlined in Section 5.2 and referred to as knowledge activities.

Figure 5.12 Concept of analysis for Knowledge output



Source: Author

This research project has revealed that it is important to understand that members of a collaboration are not only knowledge creators, but also those that define knowledge within their collective (Section 4.2 and 5.2). Thus, all knowledge activities of collaborative learning and knowledge transfer include the conscious and unintentional process of the inclusion and exclusion of knowledge. Indirectly, this forms the definition of knowledge itself for the collaboration. This process of knowledge definition is the basis for all collaborative learning and knowledge transfer activities since knowledge itself is at the core of these activities. In the context of food sustainability, these knowledge definition activities can be critical. This is particularly relevant as there are contradictory definitions in academia, politics and economics of what food sustainability is. This lack of a commonly accepted understanding and definition of food sustainability appears to be of interest for food related collaborative platforms, as members seek to influence this debate through their knowledge output. This is particularly evident through the publication of methodologies of the collaboration, such as the ENVIFOOD

Protocol of the SCP Roundtable, or through online tools such as the Knowledge Base of the PSF (Section 3.5 and 4.2). Knowledge that is not recognised by the members of a food related collaboration is likely to become excluded from their knowledge pool and, lose recognition within sustainability. Thus, the types of knowledge and the analysis of knowledge from food related collaborations are a contribution to the definition of food sustainability.

The research findings in relation to mechanisms of collaborative knowledge creation (see Section 4.2) and the types of critical knowledge in the context of food sustainability (see Section 4.3) have demonstrated that the majority of members referred to knowledge as predominantly written and illustrated forms of knowledge. These include numeric data, descriptive text or visual illustrations. Other knowledge forms that are more intangible and lay knowledge forms, such as experiences or storytelling, have not been mentioned by the majority of SCP Roundtable and the PSF members. Thus, such knowledge forms appear to be less of importance for food related collaborative groups. Certain forms of knowledge can therefore be excluded at the very beginning of collaborative activities even though the aim of such collaborations is to manage and discover knowledge within the food system.

The data collection of this research revealed that food industry led collaborative groups, such as the PSF and SCP Roundtable, have a core approach in analysing and understanding food sustainability challenges. The PSF considers food sustainability challenges from a specific food product perspective, such as a loaf of bread. In contrast, the SCP Roundtable uses a methodological approach to assess predominantly environmental aspects of food product groups, such as coffee beans, tea and drink beverages. These focuses are the lenses through which each collaborative platform defines and regards different types of knowledge within food sustainability. The danger in relation to the knowledge output is the usage of certain food products or food product groups and the drawing of generalisations and conclusions to similar food products and food product groups. An example of this is that knowledge produced by the PSF in collaboration with the retailer Sainsbury's through their specific Path Finder Project on a certain fish value chain might not necessarily reflect the same food sustainability

challenges of other fish value chains in the food system. It might therefore be challenging for food related collaborative platforms to create knowledge in the context of food sustainability, as the level of universal applicability of that knowledge is questionable. Even if a small generalisation can be drawn from that knowledge to other food products and value chains, it would not address food sustainability from a global food systems perspective. Instead, based on the focus of the collaboration, the applicability of that knowledge might only be useful to a smaller section of the global food value chain.

From a pragmatic and real-world perspective, it can also be questioned whether it is possible or useful to aim for knowledge that is universally applicable to the food system. Food sustainability challenges might be as diverse in the food system as the food system itself. The diversity and complexity of the food system is a result of its different actors, value chains, political, social and economic orders or environmental circumstances as demonstrated in Chapter two. This suggests that knowledge about food sustainability is created by collaborative platforms in relation to specific situational circumstances. In addition, the collective's aim to generalise and create universal knowledge can also be seen from a less absolute perspective. The knowledge created might not be exactly applicable to other situational circumstances in the food system, but they might be applicable and useful to some extent.

The interviews from both case studies revealed that for most members it is critical to include a broad spectrum of knowledge that preferably covers all aspects of food sustainability (see Section 4.3). At first glance this appears to be logical and positive since knowledge that covers more areas of the food system can be highly beneficial in understanding the complexity around certain food sustainability challenges. This is also in line with current literature that points to the complexity and diverse topical spectrum of food sustainability (Aiking and De Boer 2004; Gupta 2004; Lang et al. 2009; Lang and Barling 2012).

This holistic approach of aiming to cover a wide range of topics can also lead to an ongoing phase of knowledge collection and to a difficulty in building a coherent body of

collaborative knowledge. The research findings suggest that the desire to collect a broad spectrum of knowledge within collaborative platforms on food sustainability might be based on the following three elements:

1. The insecurity about the definition of food sustainability
2. The element of being overwhelmed from the complexity of the food system
3. The differences between member preferences within multi-stakeholder platforms

As mentioned in earlier in Sections **Error! Reference source not found.** and 4.1.1, the term food sustainability is not clearly defined, which can make the work on food sustainability vague and less tangible. This not only allows stakeholders to bring in their own interpretation and definition it also makes it difficult to understand what types of knowledge are critical in relation to food sustainability. A consequence of this for food related collaborative platforms can be the presence of an insecurity over what food sustainability entitles. Thus, to ensure critical food sustainability themes are comprehensively covered, food related collaborative platforms aim to create and focus on a broad spectrum of knowledge.

The second reason for this holistic approach of food related collaborative platforms in relation to their food sustainability relevant knowledge can be the situation of being overwhelmed from the complexity of the food system. The potential availability of knowledge on various areas of the food system, particularly through technological advancements, can lead collaborative platforms to source all sorts of knowledge to cover the food system's complexity. This situation of broad sourcing and creation of knowledge can lead to an overwhelming amount of unstructured knowledge. This argument is related to the research findings in Section 4.3.1 and analysis of these findings in Section 5.3.1 on the organisation of already existing knowledge.

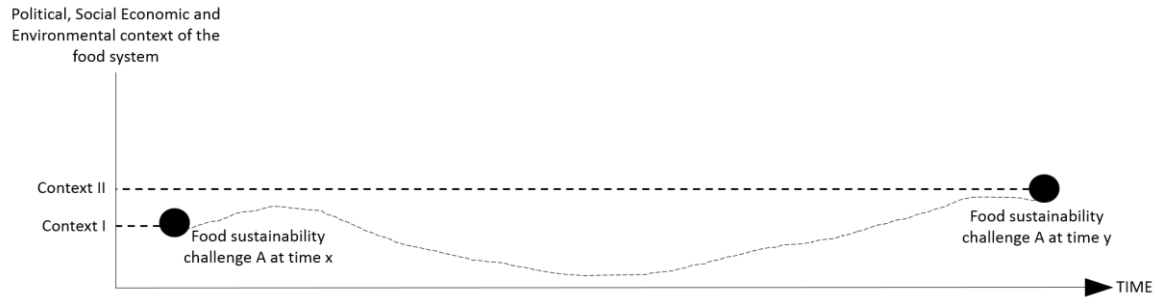
The third reason behind the desire to focus on a broad spectrum of knowledge in relation to food sustainability might lie in the membership of a food related collaborative platform. The fact that a collaborative multi-stakeholder platform consists

of individual actors with individual preferences and expertise also creates an environment of multiple desires to create and share a broad spectrum of knowledge. The research findings in Section 4.3 outlined that even though both case studies of this research have a certain level of homogeneity within their membership by being industry led, differences in their knowledge preference were evident. This might be based on the differences in individual preferences of participating individuals and their differing interpretation of details within the main agenda of the collaboration.

Another challenge that food related collaborative platforms might face in relation to food sustainability relevant knowledge output is the relevance of knowledge over time. Particularly aspects such as climate change, animal and plant diseases or geopolitical instability can change often rapidly over short periods of time. The research findings in Section 4.3 show that most of the knowledge produced relates to contemporary food sustainability issues, such as translating findings from case studies into generalised knowledge. This knowledge has a connection to a case study at a particular time and in circumstances which might change over time and thus, might lower the significance of that produced knowledge. This makes such aspects of food sustainability not only difficult to predict but makes it challenging to create relevant and applicable knowledge over time.

The food system is not a static system, as it is constantly shaped through the changing elements of stakeholder interactions, environmental or political and social aspects. The danger might be that by the time a multi-stakeholder collaboration has produced food sustainability relevant knowledge, the relevance of that knowledge might not meet the current needs of the food system (see Figure 5.13).

Figure 5.13 Changing food sustainability challenges



Source: Author

This appears to be even more challenging considering that the collaborative process of creating and agreeing upon a collective's knowledge output is a time-consuming process. Research findings from the two case studies in Section 4.2.4 that relate to joint collaborative projects revealed that multi-stakeholder collaborations in the food system can be of slow paste due to their diversity. This in turn can often be the source of inefficiency. This slow pace of collaborative platforms and their non-delivery of the delivering the anticipated results has also been outlined by a number of scholars as a clear disadvantage of collaborative multi-stakeholder groups in Section 2.1.4 (Huxham 1996; Fadeeva 2005; Williams 2012). Many members of a collaborative group perceive the high investment of time and slow pace as problematic during collaborative (Weber 1998; Fadeeva 2005). This is described through the term collaborative 'inertia' which occurs where the actual collaborative work output is often lower than expected (Huxham 1996). On the one side, it is beneficial for food related collaborative groups to have a broad spectrum of actors involved to understand food sustainability challenges from a diverse value chain perspective. On the other side, multi-stakeholder collaborations in the food system, such as the PSF and SCP Roundtable, take longer in relation to collaborative learning and knowledge creation compared to more homogenous collectives. This in turn might lead to the creation of out-dated collaborative knowledge, as the pace of knowledge creation cannot keep up with potential rapid changes in relation to food sustainability challenges. This aspect has been illustrated in the research finding in Section 4.3.

5.3.1 The organisation of existing knowledge

The research findings in Section 4.3.1 have revealed that for the collaborative work on certain food sustainability challenges, it is not only about the creation of new knowledge. To find solutions for food sustainability challenges it is more about the organisation and analysis of already existing knowledge.

The research findings show that food related collaborative platforms that work on food sustainability focus on the creation of novel knowledge, rather than the organisation of already existing knowledge. Some interviewees however have pointed out that the creation of new knowledge might add up to complexity and confusion within the area of food sustainability. Instead, for those individuals the organisation and utilisation of already existing knowledge should be a focus when working on food sustainability, as existing knowledge can help to implement food sustainability in most of current challenges (see Section 4.3.1).

The complexity of the food system and its food sustainability challenges appears to be partly rooted in the vast amount of unorganised and unstructured knowledge in the food system. A key reason for the existence of that unorganised knowledge are various and almost automated systems of knowledge output. These can be, for example, technical instruments in agricultural fields that automatically measure environmental figures such as air quality or nutritional levels in soil. Thus, the development of technology can help to manage and create complex knowledge, but it can also be the cause of uncontrolled and unorganised knowledge in the food system.

It appears to be challenging for food related collaborative platforms to solely focus on the organisation and structure of already existing knowledge. The interviews have shown that there is always the desire to create and to be unique through the creation of novel knowledge. An interpretation of this finding illustrates that the creation of novel knowledge is likely to be more valued over the utilisation of already existing knowledge. There are three key potential reasons for why the organisation of existing knowledge is a low priority for collaborative groups that work on food sustainability (see Table 5.6).

Table 5.6 Potential rationales for novel knowledge over existing knowledge

#	Reason	Why this matter
1.	Existing knowledge does not reflect the political and economic interest of the collaboration and its members	Already existing knowledge might be less likely to support a collective's specific individual political and economic standpoints and results in the collective's desire to create novel and more specific knowledge.
2.	Existing knowledge is outdated and not relevant anymore in the light of constantly changing aspects of food sustainability challenges.	The correlation between knowledge and time is a central element for collaborative platforms that work on food sustainability challenges. Thus, knowledge that is aimed to solve and understand contemporary food sustainability challenges appears to be time sensitive.
3.	The creation of novel knowledge appears more progressive for a neutral observer and thus, can help to justify the collaboration's activities and existence.	One way of expressing a collaboration's importance and validity within the food system is its ability to demonstrate knowledge output that has never been created before by other parties.

Source: Author

The first rationale outlines how existing knowledge that is even potentially critical for certain food sustainability challenges might not necessarily be of interest for a food related collaborative platform. The research findings in Chapter four have illustrated that collaborative platforms are based on certain ideological grounds that attract actors across the food system towards the collaboration. These actors often share the same or similar elements of ideology and goals. Thus, the knowledge output of a food related collaborative platforms demonstrates the political and economic interests of that collaboration. Members of a collaboration participate within a collective, as they aim for a knowledge output that expresses the core interest of the membership. The two case studies in this research were food industry led and therefore had produced a knowledge output that was more food industry friendly. Even though both, the PSF and the SCP Roundtable were food industry led, each collaboration showed some differences in its political and economic beliefs. This demonstrates that food related collaborative platforms and their membership have diverse and often specific political and economic interests. Thus, already existing knowledge might be less likely to support specific individual political and economic standpoints of the collaboration and result in the desire to create novel and more specific knowledge. This could lead to more knowledge creation within the food system and add to the complexity instead of utilising already existing knowledge. This situation becomes even more problematic when more specific

knowledge is created by food related collaborative platforms that is predominantly relevant for a niche segment of the food system. Thus, such specific knowledge can be less universal and therefore less likely to be utilised by other actors of the food system in the future.

The second reason relates to the situation where already existing knowledge is outdated and less relevant to addressing the constantly changing food sustainability challenges. This aspect has been laid out in the introduction of Section 5.3 concerning the time-consuming activities of collaborative knowledge creation (see Figure 5.13). The same argument can be applied to explain why food related collaborative platforms are less focused on the organisation of already existing knowledge. Existing knowledge might be relevant for a collaborative group in relation to its agenda but may not be applicable to current food sustainably challenges. It appears that the correlation between knowledge and time is a central element for collaborative platforms that work on food sustainability challenges. Knowledge that is aimed at solving and understanding contemporary food sustainability challenges appears to be time sensitive. This in turn emphasises the importance of the argument of whether multi-stakeholder collaborations are a suitable approach to develop and discover knowledge in relation food sustainability, since collaborative activities tend to be time consuming compared to non-collaborative activities (also see Section 5.2).

The third reason relates to the situation where the creation of novel knowledge appears more progressive for a neutral observer and can therefore help the collaboration to justify its activities and existence. The research findings of both case studies, the PSF and the SCP Roundtable, have shown the importance of members being progressive, innovative and unique (also see Section 5.3.3). Interviewees from both case studies made it clear how unique and special certain elements and achievements of their collaboration were. This demonstrates that the creation and presentation of novel knowledge appears to be an important element for food related collaborative platforms to gain internal and external validation. Novel knowledge is likely to be associated by the members and external observers as progressive, innovative or modern compared to the utilisation of already existing knowledge. Thus, one way of expressing importance

and validity of a collaboration within the food system is its ability to demonstrate knowledge output that has never been created before by other parties. The creation of novel knowledge can also have the benefit of drawing more attention from external parties compared to the organisation of already existing knowledge.

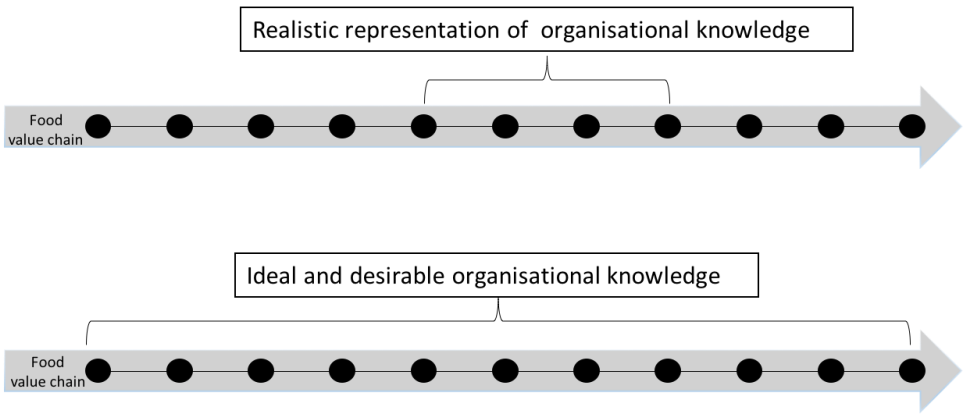
5.3.2 Organisational knowledge on food systems

The following section outlines an interpretation of the research findings that relate to the importance of organisational knowledge for food related collaborative platforms that work on food sustainability (see Section 4.3.2). The focus on food value chain specific knowledge can be understood as the need to optimise own behaviours and processes. Particularly those that help to avoid misunderstandings with other actors and improve already existing relationships. This type of knowledge can especially be critical to improve the food system towards more sustainability. This section is closely related to Section 5.3.4, since the optimisation of organisational elements of the food supply chain can have a link to the aims of an actor to have positive economic impacts on the food industry and its businesses. In this research, knowledge that is referred to as organisational knowledge is defined as knowledge that is relevant to the food supply chain including its actor interactions, structure and processes.

The research findings show that organisational knowledge or knowledge related to the food value chain can be seen at the heart of food related multi-stakeholder collaborations. A core element of collaborative platforms in the food system can be the pooling of ideas and perspectives from a broad spectrum of actors to gain a better understanding of the food system and its value chain. Collaborative knowledge creation and transfer activities that have been discussed in this thesis, such as joint collaborative case studies (see Sections 4.2.4 and 5.2.4), particularly focus on knowledge that relates to food value chain specific elements. In addition, the research findings of actors' motives (see Sections 4.1 and 5.1) revealed a strong motive of gaining an understanding of other stakeholders and processes along the food value chain.

When working on food sustainability challenges, both case studies of this research have demonstrated the importance of having a diverse membership of actors that represent the food value chain in their collective. At the same time however, it appears difficult for collaborative platforms to have a complete and inclusive representation of the food value chain within their membership. Even though food related collaborative platforms aim to capture knowledge that truly relates to an inclusive food value chain perspective, organisational knowledge sourced within collaborations is likely to be specific to certain sections and actors within the food value chain. Figure 5.14 illustrates this discrepancy between the expected scope of organisational knowledge and the actual range that organisational knowledge is likely to cover across the food value chain in the context of food sustainability.

Figure 5.14 Ideal vs. realistic spectrum of organisational knowledge



Source: Author (based on the case studies of this research project)

Figure 5.14 suggests that there is a difference in how food related collaborative platforms that work on food sustainability imagine organisational knowledge and how that knowledge actually exists within their collective. The research findings in this research have demonstrated that the actual organisational food value chain specific knowledge only focused on a certain section of the food value chain or on certain overarching themes and perspectives, such as waste reduction, or a predominantly technical and scientific perspective.

A closer look at the pathfinder project of the PSF on the potato value chain, in cooperation with the supermarket chain Co-operative Food and potato farms, provides

a good example on this limited inclusive food value chain perspective (also see Sections 4.2.4 and 5.2.4). Even though the PSF claims that this specific project was a farm to fork assessment (meaning an inclusive food value chain perspective with all involved stakeholders), an analysis of the project content revealed a focus on only certain sections within the food value chain. On one side, the PSF appears to have a convincing and sufficient food value chain perspective, but at the same time the collective puts limitations on this approach by concentrating the project aims on waste and resource efficiency. The core aims of the PSF for its potato value chain path finder project is described by the collaboration as; *"This project was a farm to fork assessment of the potential to reduce waste and improve resource efficiency in the potato value chain"* (WRAP 2014b). This demonstrates on one side a clear dedication to food value chain sections that relate to waste and on the other side a generic focus on resource efficiency. A closer look within these two focused themes reveals six key areas of the pathfinder project that can be located within the food value chain (see Table 5.7).

Table 5.7 The focus of the PSF on the potato pathfinder project

#	Focus
Focus 1	A focus on maximising pack-out rates (as well as yield) so that more of the harvested crop is available for sale to consumers.
Focus 2	Less electricity can be used in storage without impacting quality, saving emissions and cost.
Focus 3	Less water could be used to grow the crops.
Focus 4	Reductions in material usage can be achieved by rationalising packaging and staff training.
Focus 5	Transport costs, fuel and emissions can be reduced.
Focus 6	Effective supply chain collaboration, for example through order timing and promotional planning, can save significant costs.

Source: (WRAP 2014a)

By projecting these six suggested areas of action onto a simplified potato value chain reveals that many areas are predominantly linked to environmental and financial aspects of food sustainability. Elements that related to social and health implications for example are not included in the pathfinder project of the PSF, which they claimed to be a farm to fork approach. It is therefore questionable whether this project can be defined

as a farm to fork approach in the context of food sustainability when key sustainability areas are not present.

In a similar manner, Section 4.3.2 revealed that the SCP Roundtable also appears to have limitations in its organisational knowledge by having a strong focus on food industry sections of the food value chain and viewing these sections through a predominantly positivistic, technical, scientific and economic perspective. Even though the SCP Roundtable aims to have a holistic food sustainability approach that considers all stakeholders and perspectives within the food value chain, the research findings have shown the collaboration's limitation in capturing the food system's diversity. Similar to the PSF, other critical key sections of the food value chain in the context of food sustainability, such as social or health implications of sustainability appear to be under-represented within the organisational knowledge of the SCP Roundtable.

This illustrates discrepancy between a desired and a realistic approach of creating and utilising organisational knowledge in the context of food sustainability. The interviews and document analysis that have been carried out in this research with the two case studies, PSF and SCP Roundtable, have demonstrated that when working in the context of food sustainability, most members are aware of the benefits and effectiveness of creating and utilising organisational knowledge from an inclusive farm to fork perspective. This farm to fork concept is therefore advertised and put forward by the collective and its members whenever they describe organisational knowledge. The reality and actual spectrum of organisational knowledge, however, has shown with the Path Finder Project of the PSF, a limited cover of the food value chain and its food sustainability themes. Based on these research findings and analysis, this discrepancy can be partially explained through the following three reasons:

- Limitation of the membership volume and the challenge between collective efficiency versus collective diversity.

- Cognitive limitation of members through the speciality of induvial members and their specific role within the food value chain, including upstream and downstream concentration.

- Focus of members on organisational knowledge that is regarded as practical and/ or economically beneficial within the agro-industrial food system.

The first reason is based on the limitation of members within food related collaborative platforms and the collaboration's aspiration of having a holistic food value chain approach when working on food sustainability. This point has previously been outlined in a different context within this thesis (see Sections 5.1.2, 5.2.2, 5.2.4). The research findings suggest that food related collaborative platforms that work on food sustainability are likely to be in a constant balancing act between having a diverse or a more homogenous membership. At the same time, a collaborative platform that works on food sustainability is likely to benefit from a diverse membership by reflecting different positions and perspectives of stakeholders across the food value chain. This has also been outlined by several members of food related collaborative platforms (see Section 4.1). The more diverse a collaborative platform is, the more likely it can be that more actors across the food value chain are represented. At the same time, a diverse membership can lead to difficulties in collective learning and knowledge transfer processes. Thus, this situation results into a discrepancy between the anticipated inclusive food value chain approach and the actual organisational knowledge output.

The second reason is linked to the previous argument, and the likeliness of food related collaborative platforms to have a focus in their membership and within the food value chain. Individual members of the collective can form knowledge that is focused on a certain aspect of food sustainability. This focus and individual specialism, however, also makes members less knowledgeable on topics that are located at other sections within the food value chain that are outside their expertise. At this point it is important to put

a second element into account. The two case studies have shown that it is likely to have actors joining a collective when they have similar ideologies, backgrounds or interests and work in the same section of the food value chain or up/downstream to each other (see Section 4.1). Both case studies were food industry focused and have a membership that shared an overarching expertise that was specific to a certain section of the food value chain. Thus, even though a food related collaborative platform defines itself as diverse, it is likely that members share a similar focus on certain sections of the food value chain. Hence, this membership within food related collaborative platforms can lead to a situation where members aim to create organisational knowledge that covers all aspects and stakeholders of the food value chain, but lack in doing so due to the limited diversity in their membership. The expertise of the members can limit the collective in exploring and comprehending organisational knowledge and potentially draw them towards more familiar knowledge that is likely to reflect their role within the food value chain. This rationale can be particularly illustrated through the work of the Food SCP Roundtable. Even though the collaboration has a core membership of food industry actors and a focus on environmental factors, the collective claims to create and promote organisational knowledge from an inclusive and holistic value chain perspective (see Section 4.3.2).

The third reason is based on food related collaborations' focus on practical and economically beneficial knowledge within the agro-industrial food system. This point is closely related to the following Sections 5.3.3 and 5.3.4 that elaborate on practical scientific, technical and business-related knowledge in the context of food sustainability. A potential reason for food related collaborative platforms to focus their organisational knowledge on certain sections and themes within the food value chain can be the actual value of that knowledge for members. This research has demonstrated that certain sections of the food value chain, such as those that relate to food production or animal welfare, will hold a certain value for a food related collaborative platforms and their members. These preferences within a collaboration are likely to be linked to the level of perceived practicality of that knowledge, the collaboration's goals and overarching agenda of its members. This conscious or unintentional preferences of members can lead to a discrepancy where certain sections of the food value chain are under-

represented within the organisational knowledge pool of those collaborations that aim at the same time to have a holistic food sustainability approach.

5.3.3 Formal, scientific and pragmatic knowledge

The research findings in Section 4.3.3 revealed that food related collaborative platforms that work on food sustainability predominantly focus on tangible, scientific and pragmatic types of knowledge. Based on the data collection from the case studies, there are a number of potential reasons that can explain this focus on 'scientific knowledge' forms. These are:

1. Universality of 'scientific knowledge'
2. Preconditioned system of knowledge
3. Pragmatic forms of knowledge

The first rationale is based on the nature of multi-stakeholder collaborations that work on food sustainability, such as those of the PSF and the SCP Roundtable. The inclusion of a diverse range of stakeholders can bring light to a topic from different perspectives and thus enrich the knowledge pool of a collaborative platform. This appears to be highly beneficial when working on food sustainability since the food system is a diverse and complex system with a wide range of stakeholder interactions. At the same time, a high diversity within the membership of a collaborative platform can also constrain the types of knowledge that are created and transferred within the collective. As mentioned earlier in relation to collaborative knowledge creation (see Sections 4.2 and 5.2), a diverse pool of stakeholders can have a wide range of different educational and professional backgrounds that in turn might result in communication difficulties between members. This pluralistic environment can also be the reason that members focus on knowledge that is most likely to be accepted and understood by most of the other members. The interviews have shown (see Section 4.3.3) that most members from the SCP Roundtable and the PSF particularly valued 'scientific knowledge' over other knowledge forms. 'scientific knowledge' was associated with liability, neutrality, universality and replicability. Thus, 'scientific knowledge' appears to be a perfect

candidate to be used within collaborative platforms that have a diverse cohort of members. 'scientific knowledge', such as numerical equations and statistics can be seen as universal since they can be transferred between individuals with no or minor use of language. Particularly knowledge that is aimed at convincing and impacting stakeholders, such as policy makers, was seen as critical within collaborative knowledge activities. This kind of knowledge was associated by some interviewees of this research study with the creation and utilisation of 'scientific knowledge' (see Section 4.3.3). This strong belief by members of food related collaborative platforms and external stakeholders constantly feeds into a system of knowledge that benefits and propels the use and creation of 'scientific knowledge'.

The second reason relates to a predefined knowledge environment that benefits 'scientific knowledge' in the food system. The research findings demonstrated that members of food related collaborative platforms regard the current system in which knowledge is utilised and valued as given and preconditioned. Stakeholders in the food system including members of food related collaborative platforms appear to have a fixed mind-set in preferring and excluding certain knowledge forms. This is mainly based on the aim of conforming to the existing hierarchy of knowledge in the food system. Non-'scientific knowledge' forms were seen by some actors as less valuable and powerful in impacting other stakeholders and challenges that relate to food sustainability. This standpoint of certain members appears to be based on their belief in the given hierarchical knowledge order. At the same time, other interviewees elaborated that certain stakeholders, such as governments have concluded that 'scientific knowledge' is not the only valuable knowledge form when working on food sustainability challenges. This can be interpreted that certain stakeholders, including members of food related collaborative platforms are challenging the preconditioned knowledge hierarchy of the food system and recognise the importance of other, non-'scientific knowledge' forms, such as the feelings of consumers. The data in this research has however revealed that the recognition of non-'scientific knowledge' in the context of food sustainability is a minor development that is put forward by a minority of stakeholders. Most actors in the food system, including most members within food industry led collaborative groups appear to have a strong belief in the current existing

knowledge hierarchy. This in turn leads to a situation that benefits the creation and utilisation of 'scientific knowledge' over other non-'scientific knowledge' forms within food sustainability.

This acceptance of a fixed knowledge hierarchy (also see Section 2.2) can on the one side have the benefit that most stakeholders in the food system are conforming to the utilisation and acceptance of a certain knowledge forms (in this situation 'scientific knowledge'). Working within a unified system can help stakeholders to work across organisational structures easier and ensure that the creation of knowledge is likely to be recognised by other stakeholders in the food system. On the other side, working exclusively to a predefined pro- 'scientific knowledge' hierarchy can also lead to the exclusion of other non-'scientific knowledge' forms in the food system. The creation and utilisation of predominantly 'scientific knowledge' can particularly entail a structured, systematic and positivistic approach for stakeholders in the food system. At the same time this can lead to a disadvantage in knowledge creation and utilisation because of the lack of creativity, innovation and diversity. A creative and flexible approach to collaborative learning, such as mind-mapping or brainstorming can particularly help to discover effective knowledge within food sustainability. The implementation of creative and innovative learning environments within food related collaborative platforms is however something that requires the conscious effort by the members to accept unconventional learning environments.

Food related collaborative platforms and those that have an industry focus appear to evolve predominantly around pragmatic and tangible themes and thus primarily foster technical and 'scientific knowledge'. This approach can also benefit learning environments that were described by certain interviewees as pragmatic and familiar. Especially learning environments that are conventional, such as conferences or meetings can be described as pragmatic (see Sections 4.3.3 and 5.3.3). Within such environments, members are confronted with a familiar setup and know what to expect. The challenge for collaborative platforms in the food system is to find a balance between conventional, pragmatic and more creative, innovative learning environments.

The third explanation of why food related collaborative groups predominantly focus on 'scientific knowledge' is based on the aim of the collective to have pragmatic and in some cases short term outcomes. The research findings in Section 4.3 illustrated that the members of the PSF and SCP Roundtable focused on knowledge that was considered pragmatic in most cases this also happened to be 'scientific knowledge'. A specific example that illustrates this argument is the PSF project related to bread and sustainability. The members of the PSF focused among other things on the correlation of the CO_2 output of toasters along the bread value chain. In a similar manner, the SCP Roundtable sees its ENVIFOOD Protocol as a pragmatic and 'hands-on' tool that helps stakeholders to assess environmental sustainability in the food system. Such technical themes often involve knowledge that is based on scientific findings which in turn can explain the focus of food related collaborative platforms on 'scientific knowledge'. It is however important to note that a reason behind this focus on pragmatic and 'scientific knowledge' forms might be the fact that this research has focused on two food industry led collaborations. The majority of PSF and SCP Roundtable members were industry actors who tend to be engaged with knowledge that is technical and, which include a high level of applicability for their business. The production and sourcing of food products predominantly involves technical and electronic manufacturing tools and machines. This argument correlates with the transformation of the industry (including food) towards the so-called 'Industry 4.0'. This transformation is particularly driven through technological and digital developments, such as big data and automated systems through artificial intelligence. Thus, the transformation of the food system towards 'Industry 4.0' and its proposition to food sustainability relevant knowledge is likely to play a critical role. The utilisation and creation of 'scientific knowledge' in the food system is likely to rise because of the ongoing digitalisation and technocratic development of the agro-industrial food system.

This argument also aligns with other scholars such as Capello et al. who claim that developments through 'Industry 4.0' are gaining importance within the agro-industrial food system. Particularly in the area of agri-food logistics "*the Internet of Things (IoT) and, specifically, Industrial IoT, can be the answer for currently food sustainability challenges, such as food tracking* " (Capello et al. 2016, p.2). They claim that:

> *"Agrifood industry is more and more under pressure from stakeholders which require products quality and safety for end consumer. In a global world, where agrifood goods are produced remotely from the end consumer, the knowledge about conditions of the products during processing and transportation requires systems able to track changes undergone by goods all along the supply chain from producer to the end-users, in order to eventually identify the product which suffered a damage and reconstruct its story from "farm to fork" and back. (Capello et al. 2016, p.1).*

Thus, this ongoing transformation prioritises on the one side 'scientific knowledge' that is seen by actors as more pragmatic and relevant, but on the other side this development pushes other non-'scientific knowledge' forms out of food sustainability. The focus on the digital and technological aspects within the food value chain might lead to a dangerous environment, as other non-technological aspects, such as food culture or working conditions of employees might lose political importance.

At the same time scholars such as Stirling et al. emphasise that science alone does not necessarily lead to policy and political decisions (see Section 2.3.2). There are various examples, such as genetically modified food where policy makers have made decisions that are not necessarily based on the scientific evidence that was evident at that time (Stirling et al. 2015).

To conclude this section on food related collaborative platforms and their fixation on 'scientific knowledge', an overall critical analysis of 'scientific knowledge' itself can help to put the outlined reasons into perspective. The importance of 'scientific knowledge' for actors in the food system also raises the question about the providers of 'scientific knowledge'. These can have an authoritative status for seekers of 'scientific knowledge'. Scholars such as Jasanoff even argue that knowledge providers, such as science advisors have such a strong impact on policy making that they can be seen as a separate governing body (Jasanoff and Jasanoff 2004; Hustedt 2013). Similarly, Hoppe argues that researchers often have self-interests when providing knowledge to policy makers and indicates that they can have their own tactics depending on who is financially supporting the research (Hoppe 2005). It is important to mention this critical perspective of authority, which can be referred to as a social and bias construct. This can lead to

individual differences in interpretation and can have two implications in relation to food related collaborative platforms that work on food sustainability.

First, the status of 'scientific knowledge' within the food system of being neutral and trustworthy exposes a strong vulnerability for actors (including collaborative platforms) that have a strong belief in the neutrality of 'scientific knowledge'. Stakeholders in the food system that base their activities and decisions predominantly on 'scientific knowledge' might end up being misinformed and impact the food system in a potentially negative way. The trust and belief in predominantly 'scientific knowledge' can be a disadvantage particularly for actors that work in the context of food sustainability. Even though the aim of such actors might be the improvement of sustainability within the food system, the trust in potentially misleading and manipulative 'scientific knowledge' can lead to the opposite of the desired outcome or even the fostering of unsustainable practices.

Secondly, actors themselves, such as food related collaborative platforms can consciously interpret 'scientific knowledge' in their favour with the aim of creating strong and powerful evidence. It is important to note that this research project suggests that any form of knowledge, including 'scientific knowledge' cannot be completely neutral, as knowledge is always created and interpreted through individuals and groups that have a certain worldview with a subjective belief-system. Even knowledge such as numerical raw data can be affected by the collection method and in what context that knowledge is embedded. Since 'scientific knowledge' is regarded by certain stakeholders of the food system as superior to other knowledge forms, the utilisation of biased 'scientific knowledge' for evidence purposes can be a powerful tool particularly when creators of such biased 'scientific knowledge' aim to influence policy makers and thus impact policy making.

5.3.4 Knowledge on the nexus of food sustainability and business

The following section outlines an interpretation of the research data in relation to business relevant knowledge within food sustainability (Section4.3.4). In particular,

those knowledge forms that are valued by members of food related collaborative platforms and other stakeholders in the food system.

The importance of business relevant knowledge in the food system has similarities to the focus of actors on 'scientific knowledge' (see Sections 4.3.3 and 5.3.3). Knowledge appears to be particularly valuable for actors in the food system if it is considered as practical and applicable in the real-world. In a food environment dominated by the agro-industrial food system, this element of practicality translates into the aim of benefitting food industry and business interests. As mentioned in Section 4.3.4, this creates an environment where actors, such as food related collaborative platforms are in a constant balancing act of deciding between knowledge that is potentially beneficial for food sustainability and knowledge that is at the same time beneficial or at least not harmful to business interests.

Some scholars such as Nestle even argue that the core interest of food businesses is to do everything, they can to preserve the environment which allows them to sell and promote their products (Nestle 2013). A potential result of this environment can be that primarily business relevant knowledge is created and promoted at the expense of other less business relevant knowledge. Disregarding non-business relevant knowledge in the food system might lead to a disadvantage for actors that aim to find solution for food sustainability challenges. Even though the current food system is predominantly shaped by agro-industrial food production, food business and food industry relevant knowledge are unlikely to be sufficient enough to capture and understand the complexity and diversity of current and future food sustainability challenges. This argument goes back to the holistic concept of reaching 'real' sustainability through the inclusiveness of all potential elements that impact sustainability (Hardin 1968; Berkes 1985; Ostrom et al. 2002; Lozano 2007; Costanza et al. 2014). In relation to food sustainability this means not only focusing on food business relevant knowledge, but also include knowledge that is less relevant in terms of business interests. This might even cause negative economic outcomes for food businesses but benefit the food system as a whole in the long run.

Most actors within the agro-industrial food system find knowledge related to food sustainability critical and at the same time economically advantageous for food

businesses and industry. At the same time, it appears that a transformation and rethinking is occurring among actors within the agro-industrial food system in relation to knowledge of food sustainability. The interviews, in particular with food industry actors revealed a shift in the food industry from the focus on short-term benefits towards the focus on more long-term advantages (see Section 4.3.4). This shift can also influence the type of knowledge that is considered as food business sensitive. Types of knowledge, such as those that focus on the wellbeing of local communities might not seem relevant for stakeholders in the food industry in the short run. From a long-term perspective however, the support of local communities can potentially benefit a food business by securing critical resources for food production over a long period of time, such as water (see example outlined by food retail representatives in Section 4.3.4).

It is important to note that this shift does not necessarily mean that actors, such as food industry led collaborations become more open to non-business-related knowledge when working on food sustainability. This shift is rather an extension of the types of knowledge that are considered by actors as relevant for business and industry interests. This also means that the more actors in the agro-industrial food system focus on the long-term implications of food sustainability, the more likely it might be that more diverse knowledge types will be regarded as critical within food sustainability.

An additional perspective of the stakeholder focus on the nexus between knowledge on food sustainability and its relevance to food industry and business was described by a number of interviewees as consumer driven initiatives (see Section 4.3.4). This argument relates to the correlation between the food industry pleasing consumer and positive financial impacts on industry and business stakeholders. The correlation between consumer demands and the success of food businesses has been outlined by a number of scholars (Senauer et al. 1991; Vermeir and Verbeke 2006; Cardello 2007; Lang and Barling 2012). Linnemann et al. have described this between businesses and consumers:

> *"Food product development needs to be based on consumers' needs and wishes to be successful. Factors that have become relevant in this respect are presented and their impact discussed, like mass-individualization, globalization and an altered interpretation of the food quality concept by consumers"* (Linnemann et al. 2006, p.184).

This research, as well as other scholars suggest that consumer driven demands within the food system gain particular relevance in the context of food sustainability (Opara 2003; Sandhu et al. 2010; Grunert et al. 2014). An example for this rising importance of food sustainability for consumers and its impact on the food industry is outlined in an article on food supply chain traceability (Opara 2003). In his article the author states that:

> *"In recent times, the accurate and timely traceability of products and activities in the supply chain has become a new factor in food and agribusiness. Increasingly, consumers in many parts of the world demand for verifiable evidence of traceability as an important criterion of food product quality/safety. This trend has been underpinned by several market-pull factors including increasing global demand for food products originating from diverse sources, high incidence of food-related health hazards and increasing concern over the impacts of genetically modified organisms (GMOs) on the human food chain and the environment. In order to meet consumer demands for consistent supply of top quality, safe and nutritious foods, as well as rebuild public confidence in the food chain, the design and implementation of full backward and forward traceable supply chains from farm to end-user has become an important part of the overall food quality assurance system"* (Opara 2003, p.101).

The rising consumer demands of having more sustainability within the food supply chain can be a critical factor for the success of food businesses. The result of this can be that that the knowledge pool of stakeholders within the food system, such as collaborative platforms that relates to business sensitive food sustainability knowledge is becoming more diverse. Knowledge of food sustainability that was previously not regarded as critical for actors can become business sensitive when their consumers develop a sensitivity around that area. Consumers can therefore have a powerful position within the food value chain in influencing the types of knowledge that are being considered by stakeholders. This correlation however also requires end consumers to be informed and aware of certain food sustainability challenges within the agro-industrial food system and to demand changes. According to Lang and Barling, enabling consumers to be informed about the food they eat is essential in the context of food security and food sustainability. For them:

> *"The goal of public policy should be to enable consumers to make informed choices and to be able to eat what they like. Supply chains efficiencies work to that end. This consumerist-influenced approach is now at the centre of the conflict between the different versions of food security"* (Lang and Barling 2012, p.320).

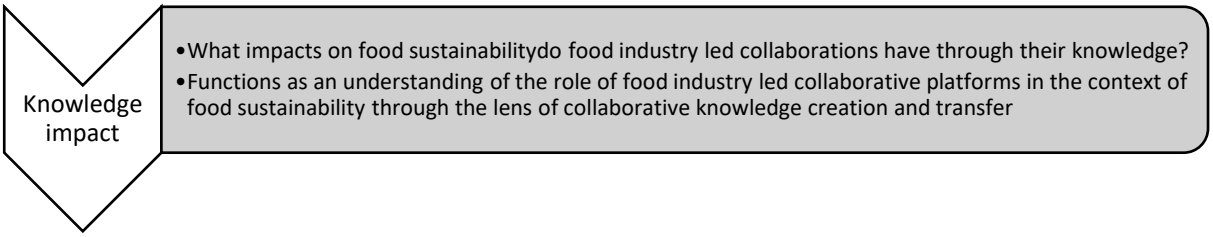
By being the most powerful stakeholder group within the agro-industrial food system, the food industry carries significant responsibility in the promotion of knowledge within the food system. Through the dominance of certain food industry stakeholders, their ability to spread knowledge across the food system through capabilities such as effective marketing strategies can be significant. In addition, successful food industry actors and businesses can exude authority within the food system through their success, which can lead other actors (even non-food industry actors) to seek the adoption of those dominant knowledge forms and views of stakeholders. The consequence of this can be that predominantly food business relevant knowledge is being circulated within the food system across a broad spectrum of actors and can ultimately become knowledge that is seen as a 'gold standard' or a norm in the context of food sustainability.

In conclusion, this section has demonstrated that the types of knowledge that are predominantly considered in the field of food sustainability are likely to be put into an economic context.

5.4 RQ4: The impact of collaborative knowledge on food sustainability

The following section relates to the fourth research question of this thesis and aims to explore the effects on food sustainability through collaborative knowledge. Within the analytical structure of this research thesis, this section relates to the knowledge impact (see Figure 5.15) and consecutively follows the previous sections.

Figure 5.15 Concept of analysis for Knowledge impact



Source: Author

These previous sections related to the motives of actors for joining a collaboration (Section 5.1), the knowledge activities concerning collaborative learning and knowledge sharing (Section 5.2.) and knowledge output regarding the types of knowledge that results from the knowledge activities (Section 5.3). This section aims to answer the fourth research question and refers to the findings in Section 4.4.

Knowledge impact on food sustainability s is defined in this research as the impact and influence on contemporary political, social, or economic food sustainability s through the knowledge that has been created and promoted by food related collaborative platforms.

The knowledge impact of food related collaborative platforms and the way knowledge is utilised and promoted within the food system is highly dependent on the agenda of the collaboration and the individual member (also see Sections 4.1 and 5.1 on actor motives). The motives and aims of members within a collaboration are critical factors on how their collaborative knowledge is promoted within food sustainability. It is therefore important to note that a discussion and interpretation of the knowledge impact is likely to be specific to the analysed food collaboration. This research has

focused on the two case studies, PSF and SCP Roundtable, which have a strong food industry character. Even though this suggests a limitation in applying the research analysis of this section on other food related collaborative groups, certain core elements of the analysis can also be seen in a wider context. This includes the role of collaborative knowledge in the context of food sustainability. These can be the result of the collective efforts and strategies to feature impactful knowledge on food sustainability concerning different aspects of the food system. The types of knowledge and the overall agenda might be different to food industry led collaborations, but the strategies in promoting and utilising collaborative knowledge in the policy domain can reveal similarities.

The research findings reveal three main areas where collaborative knowledge is likely to have an impact on food sustainability. These three themes are part of the 16 key themes of this research:

1. Direct and concrete food policy recommendations
2. Improved understanding and exploration of food sustainability
3. Voluntary Industry led changes with the aim of improving food sustainability

This research suggests that it is important to regard these three themes in relation to the impact on food sustainability. All three themes refer to areas in which collaboratively created knowledge have a strong but small impact on the, particularly due to the complexity of contemporary food sustainability challenges. Despite the presence of large and powerful actors within food related collaborative platforms, critical and substantial impacts on food sustainability appear to be challenging through collaborative knowledge. In the case of food industry members, conflicting interests and potential short term financial disadvantages can be a determining factor for this. Even though the potential of certain collaborative knowledge might be powerful and promising, the actual impact on food sustainability might be minimal from a holistic perspective, as it could be disadvantageous for individual members. In other cases, the low impact of collaborative knowledge on certain food sustainability challenges might be due to the lack of expertise in comprehending the level of complexity. The food system is a multi-stakeholder environment and the understanding of most food

sustainability challenges is likely to require the input of a diverse range of stakeholders (Sections 1.2 and 1.3). The research findings have shown that knowledge that is produced by collaborations are often created and promoted by only a small stakeholder group.

A further point that can explain the knowledge-impact limitation is due to food sustainability challenges itself and the lack of knowledge in relation to the essential elements of a particular food sustainability topic. Even if an ideal and sufficient stakeholder group is collaborating on a food sustainability issue, due to the complexity of many areas in the food system, it is likely that certain aspects are unknown and therefore not considered by the collaboration. In addition to that, certain parameters within a food sustainability challenge might change over time and it can be difficult for collaborative platforms to estimate the effectiveness of their knowledge. This in turn can translate into a low knowledge-impact as anticipated by the members. The following sections elaborate further on three key areas in which collaborative knowledge of food related collaborative platforms can impact on food sustainability.

5.4.1 Concrete and direct food policy recommendations

The following section analyses the research findings that relate to concrete and direct policy recommendations by food related collaborative platforms in the context of food sustainability (see Section 4.4.1). This research describes the policy recommendations as an influence on national and international policies and policy making processes that particularly relate to food sustainability. It is important to note that these policies do not necessarily align solely to food related policies but can also relate to policies that effect up- and down-stream sectors of a certain food value chain, such as the packaging industry.

The analysis of the organisational structure of the two case studies, PSF and SCP Roundtable, revealed that the involvement of gatekeepers can play an important factor for the knowledge impact of food related collaborations. Such gatekeepers have the potential to provide members with the opportunity to promote their collaborative

knowledge and disseminate their knowledge into certain food system domains. These can be political gatekeepers, such as the EC or WASTE and industrial gatekeepers, such as Nestlé or Coca-Cola. This rationale is exemplified through the loss of an NGO gatekeeper within the SCP Roundtable (see Section 4.2.1). The departure of the NGO member from the collaboration revealed a real concern for several members as they believed this reduced the social and political impact of their promoted knowledge.

Food related collaborative platforms, such as the PSF and the SCP Roundtable appear to have a mutual interest existing between members and governments in shaping food policy collaboratively. Governmental actors, for example the EC or Defra, actively seek the input of other actors, such as food and drink manufacturers. Not only can governmental actors be part of the collaboration through membership, but they may also participate passively as a neutral observer. Within the SCP Roundtable these were actors such as the Hungarian Ministry of Rural Development, the Spanish Agriculture Ministry and the Swiss Federal Office for the Environment. The PSF even explains in an official statement that "*The Product Sustainability Forum is also supported by Defra, the Scottish Government and the Welsh Government*" (Product Sustainability Forum 2012, p.1).

It is not only a matter of food related collaborative platforms aiming to influence food policy through their knowledge, but also a wide range of national and international governmental actors that seek external knowledge. At the same time this correlation and mutual interest can also be based on the nature and core membership of the food related collaborative platform. As this analysis was based on two food industry led collaborations, an interpretation of the research data can also suggest that governmental actors take interest in collaborative knowledge from food industry actors for social and economic reasons. Collaborative platforms with a membership of large food industry actors can be of interest for governments as they can create jobs within a region, pay lucrative taxes and are critical for the food security of a nation. This dynamic between policy makers and food related collaborative platforms suggests a neo-liberal environment, in which industry and business actors are able to become more influential in government and play a role in shaping food policy. In addition, it is likely that other

food related collaborative platforms can also have the potential to attract governmental interest, not only for the strong economic presence they may bring, but also because they might satisfy a social or political agenda of that time.

A number of interviewees expressed that the PSF and the SCP Roundtable are not the only 'players' of food related collaborations that are shaping food policy (see Section 4.4.1). Such a competitive environment amongst food related collaborative platforms can have a disadvantage in the context of food sustainability. Collaborative groups that see themselves in a competition with other forums can end up using their resources to prove others wrong to gain more influence in impacting food policy. Instead of having a broad spectrum of collaborative groups in the food system that work towards a sustainable food system, an inefficient system might occur if collaborative groups contradict each other. This can have a negative impact on the overall development towards a sustainability food system and the potential effectiveness of collaborative platforms can lead to an underperformance. The competitive environment and the desire for food related collaborative groups to have an impact on policy making can add up to the already existing complexity in food sustainability. As each collaborative group aims to be unique and different compared to other forums, the development of parallel existing knowledge can lead to more complexity and confusion in the food system.

The analysis of the knowledge that aims to impact food sustainability policy reveals at first vague and simplified elements that appear to be disproportional to the level of complexity concerning certain food sustainability challenges. The SCP Roundtable and the principles of their ENVIFOOD Protocol such as to 'outweigh financial burden' or 'obstacles' is an example of this. The vague content might have been formulated on purpose by the collaboration as it can be interpreted in multiple ways. This in turn can make this vague knowledge more likely to be implemented in the policy making process while maintaining its core content (see Sections 4.3 and 4.4.1). Secondly, as outlined in pervious sections, food related collaborative groups, such as the PSF and SCP Roundtable, are likely to act as a policy response (see Sections 4.4.1 and 5.3). This means that collaborative groups that aim to impact policy making are likely to be drawn towards the creation of content that is regarded by policy makers as critical. Thus, the

same or similar content by food related collaborative platforms is likely to be utilised in policy making. This can be seen through the types of knowledge that are predominantly created by food related collaborate platforms in the context of food sustainability (see Sections 4.3 and 5.3). Across both case studies of this research it was noticeable that similar types of knowledge and content were promoted. This includes, for example, knowledge on carbon footprint, water footprint, CO_2 Emission or energy consumption. At the same time, food related collaborative platforms seem to be aware of this danger and a member of the PSF even stated that it was important not fall "*into a slight trap in following what everybody else was doing*" (7IU).

This interpretation suggests that the knowledge actually utilised in food sustainability policy, is likely to be determined by dominating political s rather than the actual relevance of that knowledge for the development of a sustainable food system. This policy correlation of collaborative knowledge in food sustainability can be related to the theory of punctuated equilibrium (see Section 2.3.4). Jones and Baumgartner argue that most policies remain predominantly the same except for minor changes. In relation to food sustainability knowledge and policy making, similar content is utilised by policy makers and therefore also promoted by food related collaborative platforms. The theory of punctuated equilibrium describes, in addition, that dramatic changes in a policy area are likely to happen if a dramatic and significant event, such as the outbreak of foot-and-mouth disease occurs (Jones and Baumgartner 2012). Thus, the theory of punctuated equilibrium can help to explain why the overall policy impact of food related collaborative platforms are perceived as minor in the context of food sustainability. Unless significant events occur in the policy domain of food sustainability, the knowledge impact of food related collaborative platforms is likely to be regarded by neutral observers as minor. This also aligns with the sentiment of some interviewees in this research who explained that food related collaborative platforms within food sustainability function as a response to policy.

5.4.2 Improved understanding of food sustainability

The following section relates to the research findings that concern the impact of food related collaborative platforms in contributing to the understanding and exploration of food sustainability (see Section 4.4.2). The research data revealed the two general areas that contribute towards the exploration and understanding of food sustainability, and more importantly, the specific implementation of harmonised standards and methods in the context of food sustainability.

The research findings show that there is an overall contribution of food related collaborative groups towards a better understanding and exploration of food sustainability. The best evidence for this is the fact that a diverse group of actors are actively collaborating with a focus on food sustainability. The PSF has shown that their work aims to tackle practical and tangible food sustainability problems, from food storage to food production, that can help to implement more sustainability. The approach taken by the PSF appears to allow a better understanding of common and everyday activities within the food system. Even though the PSF is a food industry led collaboration, most of their findings and suggestions are not only addressed for other food industry actors, but also towards consumers. The SCP Roundtable on the other hand appears to have a clear focus on food industry actors, particularly through their central work around the ENVIFOOD Protocol and the suggested methodology of assessing food sustainability within the agro-industrial food system (Section 3.5.1 and 4.4).

At this point it is important to note that this can also be a form of research conducted and or sponsored by food businesses in order to promote certain types of knowledge. An example for this is for example industry sponsored research on nutrition. Scholars such as Nestle point out that there is a lack of research in the space that elaborates on the role of food businesses as research sponsors. Similarities can be drawn from research that is funded by tobacco, chemical and pharmaceutical industries to illustrate the lack of hazard of their products. The findings from this research illustrate a form of industry funded research and knowledge in food sustainability and contribute to the body of knowledge on food industry funded research (Nestle 2016).

In the case of the SCP Roundtable, it appears that the exploration of food sustainability is predominantly food industry focused and on a theoretical level rather than practical. It was criticised by an SCP Roundtable member that their collective failed to communicate food sustainability to external stakeholders. This shows how critical it can be for a food related collaborative platform to have effective external communication and promotion mechanisms to ensure a visible impact on food sustainability. The research findings suggest that the SCP Roundtable's inefficiency in promoting their knowledge within food sustainability is likely due to the lack of stakeholder diversity within the collective. Indeed, the departure of the WWF and the declining support of the EC might have led to disadvantage in communicating the views of the SCP Roundtable (Section 4.2.5 and 5.2.5). The PSF roundtable in comparison appeared to be more efficient in communicating their concepts and suggestions externally through their various stakeholders from industry, government, and civil society. These actors are able to create their own communication channels and allow the collaboration to promote their knowledge effectively.

The research data also revealed that for most interviewed members, the harmonised standards concerning food sustainability was seen as a central element of their collaborative work. The overarching aim was to encounter the existing complexity on certain food sustainability challenges. The research findings, as well as existing literature, confirm that harmonisation is an effective way of synchronising actors and processes in the food system. This in turn can help to minimise the use of resources and help to develop standards around a farm to fork approach. According to a number of scholars the complexity and confusion around sustainability is partially based on the existence of a multiple and often contradictory food sustainability standards (Emery 1965; Trist 1977; Gray 1985). Positive effects associated with harmonising standards include the minimisation of environmental turbulence, and also the promotion of a unified language on which all stakeholders can explore food sustainability. This idealised and simplified view, however, appears not to capture the entire picture. A closer analysis of the research data that relates to harmonisation reveals that even this has the potential of contributing to the confusion and disagreement around food sustainability.

The aim to harmonise standards within food sustainability does not necessarily imply that actors within the food system are open to such changes.

It is notable with these two case studies how the concept of harmonisation for the PSF and SCP Roundtable is basically an illustration of their own values, goals, and preferences. For example, the SCP Roundtable does not necessarily see the reduction of packaging as a sustainable solution. According to some of its members, the reduction of packaging can contribute to more food wastage and less sustainability. This illustrates how harmonisation efforts from the PSF consider the impact of packaging on food sustainability, but the SCP Roundtable point out the benefits of packaging.

The efforts of food related collaborative groups to harmonise food sustainability standards can also be seen as imposing certain stakeholder group values and preferences within the food system. A collaborative platform that is led by NGO actors for example, is likely to harmonise standards that are NGO friendly. The danger can be that consumers and other stakeholders in the food system can become confused through the existence of multiple standards that claim to be 'right'. Thus, depending on the values and aims of a stakeholder, it is possible to pick and choose those standards that fit the best, whilst being able to claim to be in line with accepted sustainability standards (also see 2.2.2 on knowledge construction and ideology). The efforts of harmonisation within food sustainability is therefore likely to become a powerful political instrument in weakening and also empowering certain stakeholder groups.

The development and promotion of industry funded knowledge should always be critically regarded, and intentions should be questioned. Both collaborations provide disclosures and make it clearly visible that their promoted knowledge has a food industry perspective. However, the research agrees with Nestle as this level of transparency is often not enough to understand the potential conflicts with such food industry funding (Nestle 2016).

Since the acceptance of harmonised standards by stakeholders is on a voluntary basis (also see Section 5.4.3), it is likely to create an environment where different stakeholder

groups promote their own concept of harmonised food sustainability standards. Governmentally imposed standards, however, might help to consolidate the existence of multiple coexisting standards. However, this would also entail a complex political process of favouring certain harmonised standards over others.

The research findings from the PSF and SCP Roundtable reveal that both collaborations use real-life case studies to gain insights into what food sustainability standards they could set up across the food value chain. Important examples include the PSF Path Finder Projects and the ENVIFOOD pilot tests of the SCP Roundtable (see Section 4.4.2). These examples are positive in that they can help to develop standards from a food value chain perspective that are likely to be realistic as they are based on real-world scenarios. These case studies can also help to test theoretical concepts and improve standards before they are applied on a larger scale. On the other hand, this approach of using case studies can be limiting and inefficient in delivering universal applicability for food sustainability standards. Even though case studies can help to be close to real-world food sustainability challenges, they can also be very specific to a certain time, location, company or food product. It is therefore questionable how universal certain food sustainability standards are across the food system.

The aim of members within food related collaborative platforms is to reach a wide variety of stakeholders ranging from industry, consumers, and policy makers to improve the understanding of the term 'food sustainability'. This research has demonstrated that the recommendations and suggestions of collaborative platforms are likely to be recognised by only a limited number of stakeholders who share similar goals and values. Some scholars might argue this is a limitation adding up to the confusion of the term 'sustainability' rendering it meaningless (Aiking and De Boer 2004; Rogall 2008). However, this research gestures towards the understanding that this is not necessarily a limitation but rather a situation where the term 'food sustainability' can become meaningful and tangible for those actors through the use of it in a specific context (Sage 2012).

Thus, harmonised food sustainability standards can have a positive impact on the exploration and understanding of food sustainability within constrained areas of the food system. For actors such as the members of the SCP Roundtable, certain harmonised standards can be useful and necessary in the communication of food sustainability as a concept. This may not only be the case for food industry led collaborations, but also for other food related collaborative groups that represent a particular part of the food system whether they are a specific stakeholder group, a geographic region, or a specific food commodity. Therefore, the concept of a universally applicable harmonised food sustainability standard from an inclusive and holistic food sustainability perspective appears to be challenging.

5.4.3 Voluntary Industry led changes with the aim to improve food sustainability

This section analyses the research findings concerning food related collaborative platforms and industry led changes to improve sustainability within the agro-industrial food system (see Section 4.4.3). The previous sections have illustrated that food industry led collaborations are likely to utilise their own industrial and commercial infrastructure to create and transfer knowledge on food sustainability. This thesis has also demonstrated that food industry led collaborations are interested in food sustainability knowledge that is practically applicable and commercially relevant within their own industry. It is therefore no surprise that a key impact of food industry led collaborations is the suggestion and implementation of voluntarily food industry led changes that aim to foster food sustainability.

The research findings revealed that the driving force for food industry led chances aiming to foster food sustainability are based on a wish to avoid legislation. This aspect can have mutual benefits for governments and the food industry, particularly with governments that support a neo-liberalist form of governance. From a food industry perspective, voluntary commitments of fostering sustainability within the food system can have the benefit of allowing industry actors to create a more food industry friendly environment whilst implementing sustainable concepts and processes. In comparison,

legislation of ‘green’ governments is likely to be less concerned with food industry interests when imposing changes to foster more sustainability. It can therefore be essential for food industry stakeholders to collectively try and anticipate social and political demands to prevent government-imposed legislations.

On the one hand, improvements within the food industry towards more sustainability are likely to be highly significant in a food system of agro-industrial dominance. Food industry actors are dominant within the agro-industrial food system through their role as producers and distributors. It is likely that voluntary food industry changes can have a wider impact on the agro-industrial food sustainability. From an industry perspective, the food system is a highly connected network of actors attuned to each other’s action and standards. Thus, a shift by a group of large and powerful food industry actors can have synergy effects onto other actors of the food system that seek to avoid complications and comparability issues.

On the other hand, voluntarily industry led changes in the context of food sustainability can lead to risks for the sustainable development of the food system. Food industry led suggestions and changes can have low or even no impact on fostering food sustainability for all stakeholders in the food system. Food industry friendly changes that aim to foster food sustainability are likely to exclude aspects that are potentially harmful to the commercial interests of food industry actors (also see Sections 4.1.2, 4.3.4 and 5.3.2). The result of this can be that certain potentially effective food industry actions are avoided or not considered. This in turn can lead to an inefficient or non-sustainable development for certain stakeholder groups in the food system, such as consumers or NGOs. An interviewee and NGO representative expressed the concern that industry led activities around food sustainability can be a form of ‘greenwashing’ rather than an effective change leading to sustainable development (see Section 4.2.1). ‘Greenwashing’ in this context refers to a situation where food companies voluntarily commit to more sustainability with the aim of gaining consumer trust and higher turnovers through increased popularity.

From a government perspective, allowing the food industry to voluntarily implement changes can have several benefits. Governments can save money and resources by not having to develop, execute and control food industry legislation. This is because of the responsibility of the state to inform its citizens and provide reassurance over the effectiveness of strategies that aim to foster food sustainability. This aspect can become particularly challenging for governments because food sustainability is a complex and vaguely defined area. A further motive for governments to favour voluntary industry led changes is the national economic and infrastructural importance of the food industry. Food industry actors form a vital economic stakeholder group that provides employment, taxes and know-how to a government and its citizens. At the same time, within an agro-industrial food system, food industry actors can be seen as essential for food security. This situates food industry actors in a strategically dominant position. It is therefore likely that governments aim to maintain a positive relationship with food industry actors and take a more neo-liberal approach in the development of a sustainable food system.

Food industry led collaborative groups, such as the PSF or SCP Roundtable, that include numerous large food industry actors can be even more dominant in food sustainability (see Sections 1.2 and 3.5). Such collaborations have the potential to exert political power in food policy and within food sustainability. They are indirectly able to impose regulations and standards on to the food system through voluntary industry led changes.

5.5 Discussion

The following section is a discussion of the key points of the analysis Chapter five and links these to a wider academic and real-world discussion. First, this section summarises the key points from this analysis chapter (Chapter five). Second, this analysis also explores the academic contribution of this research in relation to collaborative multi-stakeholder platforms and their role as knowledge creators and providers within the food system and food sustainability.

The findings and analysis (Chapter four and five) are first discussed in a broader context considering existing literature on collaborative platforms, explaining how the thesis extends this body of knowledge. In addition, this section discusses the summarised key findings on collaborative knowledge by contributing to existing literature on knowledge in food policy and food sustainability. The last part of this section pulls all the key findings and their analysis together and discusses a knowledge food sustainability dilemma in relation to food related multi-stakeholder collaborations. This discussion has a multidisciplinary approach and contributes to the two academic fields of food sustainability and collaborative knowledge.

5.5.1 Collaborative platforms in the food system

The analysis of the research findings has shown that not all stakeholders within a system are equal when it comes to the capabilities and resources needed to form and maintain a collaboration (Section 5.1.2). The thesis extends the existing literature on collaborative platforms and demonstrates its relevance to the field of food policy and food system studies.

It is important that the academic literature on collaborative activities recognises the interdependence of actors, because of the relatively high level of multi-stakeholder activities and supply chain interactions within the food system. Collaborative platforms are specific to the system in which they are created and in which they participate. The literature on the importance of collaborations between supply chain partners is of particular interest for the area of food policy and food system studies (Andraski 1998;

Anderson and Lee 2001; Hamprecht et al. 2005; Maloni and Brown 2006; Matopoulos et al. 2007). This research has shown that a system with a high level of organisation and structure, such as the food industry, create an environment that encourage actors to form collaborative platforms. In the food system, stakeholders, such as consumers or environmental groups do not have the same level of interconnection as industry actors and therefore have a weaker starting point for forming and managing a collaboration in the first place (Sections 5.1 and 5.2). Literature that focuses on the definition and creation of collaborative platforms should also be concerned with the financial resources of certain actors and stakeholders. In the food system, stakeholders do not have the same financial resources to engage in extracurricular activities. The formation and maintenance of a multi-stakeholder collaboration requires time and costs for travel, communication and administration. Larger stakeholders in the food system, such as food industry actors, are more likely to have such capabilities compared to other stakeholder groups.

The findings of this research also contribute to the academic literature on collaborative platforms (Gray 1989; Wood 1991; Huxham 1996). In the food system, individual actors that collaborate in a multi-stakeholder platform have an interest in the overall shared goals and common interests (Section 5.1). In addition to this, it is equally important for individual actors to join a collaboration because it gives them access to knowledge and intelligence on other members located up- and downstream in the food supply chain. A number of scholars refer to this phenomenon as the decrease of 'environmental turbulence' (Emery 1965; Trist 1977; Gray 1985). Existing literature does not discuss how individual actors may join a collaborative platform to connect with certain members rather the collective as a whole. Thus, the decrease of environmental turbulence within food related collaborative platforms might not apply to the entire supply chain but only between certain actors.

Concerning food industry actors, this attraction to specific members within a collaboration is also extended to competitors that operate in the same area of the food system (Section 5.2.3). Existing literature, such as Huang and Yu, argue that direct

competitors are able to participate in a non-competitive collaboration if they bring a non-competitive mentality to the platform (Huang and Yu 2011). In relation to the food system and food industry actors, the research findings of this thesis disagree with the position of Huang and Yu as the existence of shadow agendas is a critical element within non- and pre-competitive collaborations (Section 5.2.1). This supports the view of Lozano that the way competitiveness within collaborative platforms is portrayed theoretically does not necessarily reflect reality (Lozano 2008). In the food system, and particularly within food industry led collaborations, members are likely to have a shadow agenda based on a competitive mentality even if the collaboration is non- or pre-competitive. The findings have shown that members might even participate in a collaboration with the aim of slowing down the progress of the collaboration or promote their own shadow agenda at the expense of the agenda of the collective.

Existing academic literature on competitiveness within collaborative structure can be further extended and applied to field of food studies. Even though this research has shown that competitiveness is unlikely to be completely absent within collaborative platforms, it appears that a shift from competitive to non- or pre-competitiveness can occur in certain areas of interest. These shifts particularly relate to areas where transparency is seen by members as a requirement to achieve the common goal of the collaboration. This is particularly evident for collaborative platforms within the food system that work in the field of food sustainability. Here, an open dialogue on resource and raw material management is seen as a necessity. Thus, existing literature on competitiveness can be extended by recognising that within collaborative platforms, key areas of interests that would usually be regarded as competitive, can become non- or pre-competitive if the collective agrees that it is an essential area for the accomplishment of its goals.

The findings from this research support and expand the academic literature on stakeholder motives for joining and creating collaborative platforms (Section 5.1). Motives for joining a collaborative platforms described in previous literature can be extended in the area of food studies (Emery 1965; Trist 1977; Gray 1985; Pellicelli 2003;

Fadeeva 2005; Innes and Booher 2010; Williams 2012; Huxham and Vangen 2013). The complexity and diversity of the food system leads to a broad spectrum of opinions on and interests in key areas, such as food sustainability. The collaborative advantage of gaining political bargaining power and the ability to connect with likeminded strategic partners and alliances is therefore critical for stakeholders in the food system aiming for political impact. For scholars such as Nestle partnerships and alliances are calculated instruments for food businesses to gain control and power over government regulations and fortune of consumers (Nestle 2013).

This thesis has found that the political bargaining power gained through food related collaborations is not necessary used to promote the interests of small stakeholders (Section 5.1.). In the food system, and particularly within the food industry, it appears that alliances are also sought to gain access to soft forms of political power regardless of the financial power of an individual stakeholder. Stakeholders, such as large food and drink manufacturers, can seek the collaboration of smaller civil society actors to gain political and social legitimacy.

Highly controversial issues within a system can also foster and benefit the creation of collaborative multi-stakeholder platforms. In the existing literature, scholars such as Gray and Huxham argue that a collaboration can be a response to a crisis or conflict (Gray 1989; Huxham and Vangen 2013). The thesis has shown that a controversial issue can be part of a conflict or crisis (Sections 5.1 and 5.2). A controversial issue, such as food sustainability, causes polarising views across stakeholders and create uncertainty within the food system. Through the findings of this study, the existing literature is extended by recognising that the rising complexity of the food system also leads to polarising and controversial issues, which in turn foster the creation and occurrence of collaborative multi-stakeholder platforms.

Collaborative platforms in the food system appear to be highly connected to time sensitive motives and goals. Porter pointed out that within non-competitive collaborative platforms, short term individual losses might be accepted in change for long term benefits (Porter 1980; Porter and Kramer 2002). This appears to be only partially relevant for collaborative platforms in the food system. Particularly for those

collaborations that work in the context of food sustainability where agendas mostly aim for long-term goals and effects. Potential individual short-term losses have become less important for stakeholders as long-term benefits appear to outweigh negative costs. Collaborative aims, such as the improvement of environmental factors or countering resource depletion, require a long-term approach. This shift of stakeholders to recognise the importance of long-term benefits over short term gains is also fostered through the development of technology and telecommunication. New advanced methods allow the measurement of unsustainable long-term effects and the prediction of future scenarios through computer modelling. This sharpens the awareness of many stakeholders towards more long-term actions within collaborative platforms. The findings of this research have shown how the business models and financial plans of food industry actors are set out for the next decades (Sections 5.1, 5.2.3, 5.2.4 and 5.3.4). In comparison, short term losses appear to have lost significance and only play a minor role. For the food system, and particularly the food industry, the classic distinction between short-term gains and long-term benefits within collaborative platforms appears to be outdated, as the majority of stakeholders have shifted towards long-term goals.

The findings of this thesis therefore emphasise existing literature that refers to strong correlations between long-term commercial interests and collaborative initiatives that aim for sustainable development (Hamprecht et al. 2005; Maloni and Brown 2006; Markley and Davis 2007; McMichael 2009; Sharma et al. 2010; Spaargaren et al. 2013). Existing literature appears to describe this correlation as something less obvious for food industry actors. However, the research findings have shown the contrary with food industry actors. These are in a constant process of supply chain optimisation, which for most stakeholders is a question of sustainable development. Larger food industry stakeholders appear to have a strong awareness of the links between sustainability and commercial advantages (Sections 5.1, 5.3.2, 5.3.4 and 5.4.3). It is therefore less the situation portrayed by existing literature where awareness on sustainability is lacking. It is more likely that stakeholders in the food system with strong commercial interests are aware of their impact and abilities in relation to food sustainability, but actively promote those options that bring the highest economic advantage.

The existing literature on collaborative structures is extended through this research by focusing on the strong correlation between the participating individual and the collaboration as an entity. Literature on collaborative learning and knowledge creation recognises the importance of the individual and its impact on the knowledge creation capabilities of the collaboration (Lozano 2008). This can be extended not only to collaborative activities, such as knowledge creation, but also to the collaboration itself. The findings of this research suggest that the identity and effectiveness of a collaboration can be significantly shaped by a small number of proactive, diligent and constructive individuals. These individuals can shape the agenda, motivate and influence less proactive members (Section 5.2). Even though this research has analysed two 'on paper' very similar food industry led collaborations that work in the area of food sustainability, their differences were partially based on certain participating individuals. The recognition of the power of individuals within a collaboration might be challenging as individuals often represent larger organisations, such as food and drink manufacturers or government agencies. At the same time, the findings of this research suggest that individuals can play a far more significant role within collaborative platforms. Their own beliefs can supersede the standpoints of the organisation they represent. These individuals are likely to interpret the official standpoints of the organisation in a way that complies with their own values. This scenario becomes even more relevant for collaborative platforms with individuals that have a powerful position within their organisation, as was the situation with the two case studies of this research (Section 5.2.1 and 5.2.4). It is therefore important for the study of collaborative platforms to recognise the importance of dominant individuals within collaborative platforms and their ability to significantly shape the identity of the collaboration.

5.5.2 Collaborative knowledge in food sustainability

The following section summarises and discusses the findings of this research project in relation to (collaborative) knowledge in the food system and sustainability. A number of scholars have pointed out the importance of academic literature contributing to the area of knowledge and food systems (Sporleder and Moss 2002; Fonte 2008). Literature

on the use of collaborative knowledge within policy initiatives has been shaped by Gray, Innes and Booher with a focus on general and environmental policy (Gray 1985; Gray 1989; Innes 1990; Innes and Booher 2010). At the same time, many scholars have pointed out the importance of further insights in the field of collaborative knowledge and within complex systems (Mowery et al. 1996; Tsang 1999; Gray 2000; Innes and Booher 2010).

The findings of this study can extend existing literature through its focus on the food system. The findings reflect that knowledge in the food system and within food sustainability rarely occurs from 'farm to fork'. As seen within collaborative platforms, knowledge on food sustainability occurs specifically and only to certain segments of the food value chain rather than for the entire chain (Section 5.2 and 5.3). The creation and transfer of food sustainability relevant knowledge does not automatically imply the knowledge captures all relevant sustainability elements. The sustainability aspect of knowledge in the food system is shaped by certain sections of the food value chain in isolation and based on the background and preference of the knowledge creator(s). Despite this limitation, stakeholders in the food system might refer to this knowledge as food sustainability knowledge from an inclusive systems perspective. This stands contrary to the current academic understanding of food sustainability that implies a holistic and inclusive world-view (Lang et al. 2001). The research findings therefore reveal the discrepancy between the real-world and theoretical implications on food sustainability.

Findings of this research that relate specifically to the types and forms of collaborative food sustainability knowledge provides a clarification on existing knowledge and policy literature (Section 5.3.2). Within the food system most actors privilege scientifically robust knowledge, which is seen as the most valuable type of knowledge within food sustainability. The findings of this research reinforce existing literature pointing out the dominance of quantifiable 'scientific knowledge' in policy making (Hoppe 2005; Innes and Booher 2010). This echoes scholars such as Innes, who emphasise that an evidence based and technocratic approach of policy and decision making is prevalent within food related collaborative platforms and food policy (Innes 1990).

For certain stakeholders in the food system, non-'scientific knowledge' is seen as less valuable in the policy bargaining process. Other types of knowledge are equally important such as experiences or perceptions which are likely to be translated into 'scientific knowledge', such as numeric statistics. Quantifiable and 'scientific knowledge' forms within the food system function as the preferred type of knowledge within a collaboration.

Existing literature on collaborative learning in the context of sustainability emphasise the benefits of enhanced creative learning through group dynamics within collaborations. Lozano in particular has discussed the benefits of creative knowledge for improving cognitive abilities to encounter complex sustainability challenges (Lozano 2014). The findings of this research agree with the critique of Lozano that the ability to reach collective creativity is limited through a barrier between individual and organisational learning. Moreover, this research suggests the fixation on scientific and quantifiable knowledge by most individuals creates a collaborative environment with set mental models and limited collective abilities of creative learning (Section 5.2 and section 5.3.3). Collaborations within a multi-stakeholder system such as food are likely to struggle with creative organisational learning, as scientific and quantifiable learning models are universally accepted by most stakeholders within a complex system. The more complex a system is the more difficult it is for collaborative formations to compromise on certain mental models or find common ground, particularly if there are diverse and varied stakeholders involved. Knowledge in the food system that is referred to as new, innovative, or creative are likely to be in the form of scientific and quantifiable knowledge. The findings have shown that even enhanced technological developments that could potentially enable more creative and alternative ways of collaborative learning, were predominantly utilised by food related collaborative platforms to create and manage scientific and quantifiable knowledge forms.

Despite the emphasis of informal and insider knowledge by a number of scholars, the findings of this research have shown that those knowledge forms are less favoured by

stakeholders and are rather seen as a breach of trust within collaborative platforms. Clarke and Roome have outlined that collaborative formations can exist along a spectrum of informal and more formal partnerships (Clarke and Roome 1995). The existing academic literature can be extended through the findings of this research, as it suggests that the formation of formal stakeholder engagements is more likely to exist than more informal partnerships. There are a number of reasons underpinning this and the findings of this research project even suggest that within the food system informal collaborations are likely to be the exception (Section 5.2.2). The enhanced development of social media platforms and the digitalisation of processes have created an environment where stakeholder activities can be traced and tracked by other stakeholder groups and even the public. Stakeholders in the food system, especially those that attract strong polarising public and media attention, such as large food and drink manufacturers are therefore reluctant to be engaged in informal collaborations.

At the same time, collaborative platforms in the food system, such as the two case studies of this research, are also actively seeking media and public attention on selective issues. This provides more exposure to stakeholder activities and inadvertently makes stakeholders more accountable to the public which ultimately leads them to operate more cautiously and compliantly. This reinforces transparency, equality and traceability in the collaboration and in doing so the circulation of informal knowledge becomes subject to more scrutiny (Section 5.2.2). The development of social online media and telecommunication technology leads stakeholders to be more transparent and traceable with knowledge they use for political bargaining processes.

Within the food system, it appears that most stakeholders are drawn towards knowledge that can be referred to as pragmatic. Existing literature, such as Karlson explains that there has been a shift in the last century from ideological knowledge towards more pragmatic forms of knowledge in policy and decision making processes (Hustedt 2013; Karlson 2013). In addition, Persson states that the policy making process is more about the gathering of knowledge that is defined as valuable rather than the nature of knowledge (Persson 2013). The findings of this research can contribute to this

existing literature, as the two elements of valuable and pragmatic knowledge have a high relevance for the food system and its collaborative stakeholder interactions. For collaborative platforms in the food system, the creation and utilisation of pragmatic knowledge is privileged over knowledge that is regarded as less-pragmatic or too theoretical (Section 5.3.3). The focus on 'scientific knowledge' within the food system demonstrates the tendency towards pragmatic knowledge. The key motive for stakeholders for using (pragmatic) 'scientific knowledge' is its high applicability to day to day activities and challenges. Additionally, 'scientific knowledge' that is seen as too high level and abstract is unlikely to gain the same level of attraction by stakeholders in the food system.

For many stakeholders in the food system, and for food industry actors and policy makers, pragmatic knowledge translates often into knowledge that is potentially advantageous for current and future economic developments (Section 5.3.4). Food businesses want to increase their profits, policy makers aim for economic prosperity, and consumers request food products that are competitive in price. The food system benefits from the creation and utilisation of knowledge that considers a diverse range of positive economic factors. The findings of this research have demonstrated that even within complex environments and political debates, a wide range of stakeholders view knowledge predominantly through a lens that privileges economy. Within food sustainability, it appears that for many stakeholders in the food system, certain knowledge holds more value than others. Critical knowledge in the context of food sustainability is therefore not necessarily knowledge that brings the most benefit for a sustainable development. Critical knowledge within food sustainability is likely to be regarded first from an economic standpoint before it is evaluated against the effectiveness for food sustainability.

Valuable knowledge in the food system and within food sustainability can be regarded from a supply and demand perspective. Stakeholders, such as collaborative groups actively and unintentionally value knowledge that is likely to translate into power. Power for stakeholders can also be knowledge that is relevant for policy makers. Existing literature has captured the importance of knowledge utilisation in policy making and

how that knowledge is sourced and used by policy makers (Weiss 1977; Weiss 1979; Innes 1990; Parsons 2002; Taylor 2006; Stevens 2007). In the food system, collaborative platforms are a constant vehicle for creating and providing their knowledge in a way that makes their knowledge more likely to be sourced and used by policy makers. This way of (collaborative) knowledge creation and provision can help certain stakeholders steer and impact the policy making process in the food system.

5.5.3 The knowledge food sustainability dilemma within collaborative platforms

The research findings that relate to collaborative learning within the food system contribute to the literature on mechanisms and concepts of collaborative, multi-stakeholder knowledge creation and transfer. The research findings suggest that within food related collaborative platforms the ability to create and transfer knowledge is partly dependent on the level of homogeneity and internal integrity of the collaboration (Section 5.2). Particularly within collaborative groups that work in the field of food sustainability, the creation of different forms of knowledge showing the thinking of multiple stakeholder appears to be challenging. For collaborative groups that work in the field of food sustainability, a trade-off has to be made between a diverse multi-stakeholder collaboration and a more homogenous one. A more diverse collaboration that has a broad membership of food system stakeholders is likely to produce a diverse body of knowledge compared to a more homogenous forum. Diverse groups however are less efficient in the creation and transfer of knowledge, as individual members have more differences in learning capabilities because of their diverse backgrounds. More homogenous groups can be more effective in the creation and sharing of knowledge, which at the same time is less likely to be diverse and thus less effective for food sustainability from a systems perspective. This situation can be referred to as the knowledge dilemma of collaborations in food sustainability.

The knowledge dilemma of collaborations in food sustainability has implications on existing concepts of collaborative learning and can therefore add to the literature on collaborative learning. Literature by Nahapiet and Ghoshal point out the importance of social capital elements for collaborative knowledge creation (Nahapiet and Ghoshal

1998). Social capital in knowledge management is an element within the structure and membership of collaborative formations, such as trust or shared language and culture. That social capital element impacts the learning process and knowledge output of a collaboration, and which means that a shared professional and personal culture forms the foundation of collaborative learning. The learning model by Nahapiet and Ghoshal that uses social capital as a starting point is therefore highly relevant for collaborative platforms in the food system. For a deep understanding of collaborative learning processes within the food system, it is vital to consider the social capital of participating members. Because of the stakeholder diversity in the food system, it becomes particularly relevant to consider the variety of social capital elements that follows from that. A formation of a true multi-stakeholder collaboration in the food system can be beneficial when working in the context of sustainability. But at the same time, the diversity in social capital can lead to challenges in the creation and transfer of collaborative knowledge.

The knowledge dilemma of collaborations in food sustainability can also be applied to literature on the importance of collaborative learning through iterative processes of rethinking, reframing and challenging of existing mental models (Nonaka 2006; Innes and Booher 2010; Lozano 2014). Examples on this are the concepts of triple-loop, discerning and inquisitive learning. These forms of learning describe an advanced form of learning that includes stages of reconsidering, questioning and reframing existing knowledge (Doppelt 2009, Argyris and Schon, 1974; Georges L. Romme and Van Witteloostuijn, 1999; Anon and Smith, 2000; Lozano, 2014). Food sustainability issues are often composed of diverse but interconnected areas within the food system, ranging from health, environment to social responsibility (Section 1.2). It is therefore critical for food related collaborative groups to include a learning process that considers a variety of perspectives and areas. The ability to create collaborative and diverse knowledge correlates with cognitive processes of rethinking, reframing and the challenging of existing mental models. Whereas relatively homogenous collaborations are less likely to challenge existing mental models, more diverse collaborations will have the ability to challenge existing models because of members' exposure to different forms of knowledge.

To move from an unsustainable to a more sustainable food system, it is important for collaborative platforms to develop knowledge that anticipates change and enables them to do things differently than before. Thus, the ability of collaborative platforms to challenge existing mental models and be truly engaged in the creation of new knowledge, depends on the heterogeneity of the collaboration's membership. Otherwise, collaborative groups become engaged in less advanced learning processes that are less likely to create innovative and novel forms of knowledge that foster sustainability in the food system.

This research also contributes to existing literature that relates to collaborative learning through dialogue (Isaacs 1999; Innes and Booher 2000; Feldman et al. 2009; Innes and Booher 2010; Bohm 2013; Quick et al. 2015). Collaborative learning through dialogue (Section 2.2.5) is particularly relevant for the area of sustainability as the element of collaborative creativity can enhance the creation of knowledge that is likely to foster sustainability (Bäckstrand, 2010; Lafferty 2006). Innes and Booher's concept of authentic dialogue considers the level of harmonisation within a membership of a collaboration (Innes and Booher 2010). Authentic dialogue is a process within collaborative groups that enables aspects such as relationships, reciprocity, learning and creativity. In this context, the knowledge sustainability dilemma of collaborative groups is highly relevant since shared identities and meanings have an impact on the authentic dialogue. It involves an interactive process between members that shapes collaborative and creative learning processes. Thus, the research findings extend this aspect by placing homogeneity/heterogeneity as a central element within the authentic dialogue. Particularly within multi-stakeholder environments, collaborative learning processes through dialogue are strongly dependent on the homogeneity/heterogeneity of a collaboration.

Innes and Booher point out the importance of a bricolage within the collaborative dialogue (see Section 2.2.5). This describes a situation where goals and end points of a collaborative process are only vaguely defined. With a bricolage, a collective can move from vague ideas towards a goal that is shaped through the process, rather than having

a clearly predefined end. The findings of this research reflect that the ability of a collaboration to work with flexible, diverse and open goals is dependent on the level of diversity within its membership. A more heterogenic membership is more likely to consider alternative outcomes, whereas a more homogeneous collaboration is likely to agree on predefined goals. Especially the ability of a collaboration to consider alternative and diverse outcomes can foster the creation of knowledge that is beneficial for sustainability, as it is also more likely to challenge existing mental models.

An important implication of the knowledge sustainability dilemma within collaborative platforms is its implications for Bryant's knowledge-policy-change model (Bryant, 2002). The model describes a linear process of policy change scenarios impacted by knowledge. Those scenarios of policy change can range from no changes to gradual changes and more radical policy changes. According to Bryant, stakeholders have different ways of creating, transferring and utilising knowledge in relation to a specific issue. This in turn can determine the impact on a policy area, such as food sustainability. The knowledge-policy-change model (Section 2.3.6) is highly applicable to collaborative learning processes within the food system and food sustainability (Bryant, 2002). The impact level of collaborative knowledge on food sustainability depends on differences and commonalities between the members in creating and organising knowledge. Food related collaborative groups with a diverse membership are likely to create, transfer and organise knowledge through various differing perspectives. In contrast, a more homogenous collaboration is less likely to have that capability. Thus, considering the knowledge-policy-change model, a diverse collaboration is more likely to cause a paradigmatic policy change in an area, such as food sustainability. A mainly homogenous collaboration is likely to cause softer forms of policy change such as normal and gradual paradigmatic change.

5.6 Summary

This chapter has analysed and discussed the research findings and correlated this back to the literature in Chapter one and two and provided answers to the four research questions (see Chapter three). In order to maintain the argumentative structure of this thesis, this Chapter five was structured after each of the four research questions accordingly. This summary will highlight some of the key elements that were outlined in this analysis chapter.

The motives for industry stakeholders to join a food related collaborative platform is predominantly dominated by financial and business interests. All other motives such as harmonisation or environmental production are correlated to the development of business finances. Improved environmental circumstances are beneficial as they secure the longevity of raw materials and resources, but are also advantageous for positive 'green' marketing which in turn raises consumer generated income. On the 'first look', aspects such as animal welfare or climate change might appears appear to be a gesture of 'good will' by food companies but in reality, they are conscious efforts to push financial gains upwards. It is important to recognise this relationship in future academic literature in relation food related collaborative platforms and motives for joining. This chapter has also outlined that collaborating also means for stakeholders to invest time and resources in order to join and participate regularly within a collaboration. Those collaborative platforms that were investigated in this research required members to be able to travel on a regular basis and have enough financials to afford one to two days away from their business. Even if collaborations claim to be open to all stakeholders, the practicalities and etiquette when joining and participating within a collective can build an invisible barrier for many, such as small and mid-scale NGOs and businesses. This chapter has pointed out that existing literature has not elaborated on this aspect and it will become an even more important issue as global food businesses and brands are likely to grow and provide collaborative spaces for other stakeholders that are similar in their financial capabilities.

This chapter has analysed the research findings that focus on the different collaborative mechanisms and activities of learning and knowledge sharing. A key element in the

analysis was that members had to be regarded by other members as either historically, financially significant and/ or the owner of industry specific 'know-how' in order to influence collaborative learning and knowledge sharing. Another factor was that existing and old learning mechanisms were strongly internalised by members that it blocked their ability to learn through alternative methods. This in turn makes it more difficult to create and transfer knowledge on sustainability existing forms of learning have led predominantly to knowledge that promotes unsustainable practises.

Within collaborative platforms learning and knowledge sharing can be affected by a 'knowledge hub' which can be a person or organisation. The 'knowledge hub' can also be seen as a knowledge broker as it aims to provide neutral expertise and 'neutralise' sensitive knowledge within the collaborative space. These 'knowledge hubs' appear to have a far more importance within collaborations and their knowledge mechanisms than portrait in existing literature. This research has shown that 'knowledge-hubs' can help to guide the collaborative learning process but they can also manipulate and restrict.

The third section of this chapter has analysed the research findings that relate to the produced knowledge of food related collaborative platforms. Similar to the first section of this chapter (Section 5.1), the main purpose of knowledge is to enhance financial profitability of food industry actors. This nexus between knowledge and business interest is an important theme that runs throughout the analysis of the research findings. Particularly scientific and quantifiable forms of knowledge were regarded as more valuable compared to less tangible forms of knowledge, such as cultural customs. Knowledge that is associated by members as scientific and quantifiable has a significant role within collaborative platforms as they provide comfort, trust, familiarity and superiority for members. This focus and preference of scientific and often pragmatic forms of knowledge is likely to have a negative impact on the creation of knowledge on food sustainability. Other knowledge forms are needed in addition to scientific knowledge in order to capture the complexity and 'messiness' of food sustainability issues. At the same time, scientific knowledge is highly advantages within collaborations that have a diverse membership. Scientific knowledge that is at the same time

quantifiable is easier to transfer between individuals even if they do not speak the same language. This chapter therefore points out that it is questionable whether food related collaborations are able to come up with knowledge that is effective in finding solutions to food sustainability issues.

The last part of this chapter has focused on the analysis of the research findings relating to the impact that collaborative knowledge has on food sustainability. The ultimate aim for food industry led collaborations is to have an impact on policy and decision makers in order to foster pro-industry policies. The findings have shown that it is more about the 'right' connections to those decision makers rather than having 'strong' and 'beneficial' knowledge content. A result from this relationship is that food related collaborations are likely to promote knowledge that is likely to be favoured by 'targeted' policy and decision makers. This in turn can be disadvantageous for food sustainability as those knowledge forms favoured by politicians are not necessarily the best to encounter food sustainability issues. It is therefore important to equally focus on the political target group of collaborative platforms in order to put their promoted knowledge into a better context.

How likely is it that food related collaborative platforms can create knowledge that is able to capture the complexity of food sustainability? Collaborations need to be exclusive and compatible enough in order to provide a space for members to learn and exchange knowledge effectively. This also requires that members are familiar with the customs and mental learning processes of each other. Two farmers are likely to share similarities in the way they learn, compared to the learning capabilities between a farmer and a Chief Executive Officer of a multi-billion-dollar food. It is however critical for food sustainability to have a collaboration that is able to develop knowledge that is diverse and complex enough to capture the diversity and complexity. This circumstance reflects a dilemma within collaborations who aim to find solutions to food sustainability issues. Current literature regard collaborations often too homogenous and linear in their membership and do not explore the relationship between membership and the overall aim that the collective aims to achieve.

The following chapter (Chapter four) elaborates on the overall conclusion of this thesis and provides reflections on the research process. In order to provide further input to existing academic literature and interested researchers, the end of Chapter four will provide some suggestions for future research in the field of collaborative knowledge and food sustainability.

6 Chapter Conclusion and Reflections

6.1 Introduction

This chapter elaborates on the key themes that have emerged by exploring the research questions. It summarises the understanding gained from collaborative platforms and the role of their knowledge in the food and food sustainability. The reflections offer thoughts on how food-related collaborative groups learn and transfer knowledge, as well as their strategies of knowledge provision and guidance for policy makers. This chapter also reflects on the research progress, limitations in the research and potential methodological improvements. Since this research is conducted in food policy, this chapter also provides overall recommendations to stakeholders in the food system. The final section in this chapter sets out suggestions for further research in the area of food related collaborative platforms and collaborative knowledge within food sustainability.

6.2 Concluding summary

This section provides a summary of the research results in relation to the research questions and overall research aim. To maintain the structured approach of this research, this section gives a brief summary of each of these key themes.

<u>The finding of common and shared understanding of food sustainability</u>

The motive of harmonised food sustainability standards was according to the majority of food industry actors key and confirmed existing literature on the significance of harmonisation. The findings on harmonised food sustainability standards is a political as well as an economic desire for stakeholders. The lack of clarity around and definition of food sustainability has led to the existence of multiple food sustainability standards. This causes disharmony in the food system as actors operate under different standards. Businesses, such as food suppliers, face higher costs as they have to comply with a wide

range of standards. In addition, governments have higher administrative costs in responding to conflicting food sustainability standards.

The use of the theme of common and harmonised food sustainability standards was useful in understanding the motive behind stakeholders investing time and resources in collaborative activities. At the same time, this theme was of relevance in relation to the two case studies of this research. The PSF and SCP Roundtable are two food industry led collaborations with the involvement of governmental actors. This membership constellation is likely to have had an impact on members and their perceived importance of the harmonisation motive. In conclusion, the motive of finding a common and shared understanding on food sustainability is critical, especially for food industry and government stakeholders.

Unsustainable practices and their tangible effects on the food system

This theme of unsustainable practices and their tangible effects was useful and effective in answering the first research question. It is likely that this theme was perceived as critical by the interviewees because of the strong food industry characteristics of the two case studies. The research has shown that concerns around food sustainability have become more threatening for the economic prosperity of stakeholders through negative developments such as resource depletion, environmental catastrophes and food scandals. It is likely that this theme is also critical for non-industry led collaboration but concerns over tangible effects are likely to be from a public and environmental health perspective.

The interviews have also revealed that members were not only motivated by tangible effects, but also mentioned personal and emotional motives for improving sustainability in the food system. The research findings have shown that a key motive for members to join a collaborative platform is their individual desire to have a more sustainable food system. Personal interests of members in the area of food sustainability can be the driving motive. This can particularly be the case with individuals that are decision makers

and hold a senior position within their organisation. Since this theme focused on tangible effects, the focus on personal and emotional motives were initially not considered. In conclusion, the strongest motive for industry actors to join a collaboration and foster food sustainability is likely to be a combination of personal, emotional and business interests.

The 'bandwagon effect' and the presence of respected actors

The theme of the 'bandwagon effect' and the presence of respected actors revealed a useful perspective on answering the research question regarding actors' motives. A collaboration consists of many individual stakeholders. An essential driver for actors to join the collaboration in the first place was the reciprocal interest of members into each other's perceptions and activities. Thus, beside the significance of this theme expressed by the interviewees, it appeared compelling to understand the role of the membership and the motives for joining a collaboration.

The 'bandwagon effect' appeared to be highly relevant for food industry actors. This includes an interest in gaining knowledge related to competitors, supply chain partners and government stakeholders. In particular, large food and drink manufacturers and government actors appeared to be popular stakeholders within the collaborations. These actors functioned as strong pull factors for other, predominantly smaller food-industry actors. In conclusion, it is likely that the presence of certain stakeholders with economic or political power is able to draw attention to a collaboration they participate in. The interviews with members also gave the impression that collaborators who work on new and innovative areas, such as food sustainability are likely to benefit stronger from the 'bandwagon effect', as they emanate a sense of pioneering. The presence of respected and successful stakeholders provides for such futuristic collaborations a level of legitimacy and reassurance for other stakeholders, and motivates them to participate or even believe in the idea.

Agenda setting and power distribution

The research findings highlighted the importance of the agendas and goals within collaborations and the impact they have on the collaborative learning process. These agendas are often predefined and aim to function as a guidance for the collective to structure and organise their collaborative activity. Analysis of the research findings has shown that set agendas and goals prioritise certain issues and trigger certain mental models that set out the collaborative learning process. In comparison, a collaborative approach with no or flexible agendas and goals are more likely to offer more diverse and multiple mental models as participating individuals are less likely to fall into their associated mental model and learning patterns.

This theme on agenda setting was useful in exploring the second research question on collaborative learning processes. It emphasised previous research by Lozano on learning processes and sustainability. Lozano pointed out that for the creation of food sustainability relevant knowledge, the status quo of existing knowledge has to be challenged as otherwise internalised mental processes are used to create knowledge. These old models have previously led to unsustainable ways of thinking and unsustainable outcomes (Lozano 2014). Thus, flexible and open agendas or goals are likely to be beneficial for the creation of collaborative knowledge on food sustainability. The research findings showed however, that most members disliked flexibility. Open agendas and goals were perceived as messy and an unstructured way of working. The conclusion that can be drawn from this theme is that despite the potential benefits of flexible agendas and goals, when working on sustainability, stakeholders in the real-world are less likely to collaborate on that basis. Particularly within collaborations where members are unfamiliar to each other, it is likely that internalised mental models are used to compensate for uncertainties through tested and familiar ways of working.

Formal vs. informal forums

The research revealed that most members within collaborative platforms preferred more formal learning environments than informal. The reason for this is the negatively associated 'behind closed doors' conversations and the aim of being transparent within collaborative activities. From the interviews, transparency appeared to be a key element for many members of both collaborations. Particularly food industry actors felt the need as their public reputation is dependent on transparency.

This results in a learning environment where members are constantly observed by each other and even by the public. Individual members of a collaboration are likely to be more cautious about the statements and information they present within the collective. Spontaneous learning is therefore less likely to occur, and the creation of knowledge is limited to constrained learning processes. This can lead to less variety and diversity.

Thus, even though collaborative platforms aim to offer an innovative and creative learning processes for their members, the actual real-world learning process predominantly occurs through a formal setup and is therefore less likely to create real innovative knowledge. This sort of knowledge is critical in finding effective solutions to food sustainability challenges.

The role of competitiveness and trust in collaborative learning

The research findings have shown that for collaborative learning amongst food industry actors, competitiveness and trust play an important role. Collaborative learning is more efficient and prosperous with the absence of competitive and doubtful mind-sets. Members of food-related collaborative platforms and particularly food industry actors appear to have moved away from strong competitiveness, towards pre-competitive arrangements within food sustainability. At the same time the research findings revealed that members are likely to have their own shadow agenda within collaborative

platforms which in turn can constrain collaborative learning in a similar way to having a competitive mind-set.

The exploration of the theme of competitiveness has helped to reveal the role of competitiveness within collaborations that work on food sustainability. It can be concluded that trust amongst members of a collaborative platform is often dependent on the time members spend with each other and the level of seniority amongst participating individuals. Thus, collaborative learning and knowledge transfer is likely to be more efficient amongst individuals that know each other through previous interactions, shared experiences and have established mutual understandings.

Collaborative joint activities

Many interviewees have stated that learning through action or 'learning by doing' is the most effective way for collaborations to learn. The area of food sustainability relates to real-world implications which explains the significance of action-based learning for members of the PSF and SCP Roundtable. The detailed analysis of how the collaborative platforms worked through case studies revealed that the case studies were predominantly and primarily conducted by those members with sufficient resources. Large food and drink manufacturers with their infrastructure and economic stability were likely those to conduct the case study. Even though results and insights from the case studies were shared amongst all members, the actual learning process through 'doing' applied only to those that conducted the study.

In conclusion, the theme of collaborative learning through joint case studies helped to reveal that collaborative learning occurs at different stages. On the face of the content presented in reports and webpages of the two collaborative platforms it appeared that through joint case studies all members learn and gain knowledge equally. A focused analysis of this theme however revealed that for those members that received knowledge through those that actually conducted the studies, the learning process is likely to exclude lay knowledge. Those knowledge forms are difficult to transfer through

script and storytelling and can be essential for the development of effective solutions for food sustainability challenges.

The role of knowledge broker and external experts

The research results have shown that members of both collaborative platforms perceived the EC and WRAP as important for the process of knowledge creation and sharing. The EC functions as a co-chair within the SCP Roundtable and WRAP facilitates an administrative role within the PSF.

The interviews demonstrated that SCP Roundtable members had the desire to impact EU policies on food sustainability. This has led to a situation where the knowledge creation was aimed to be in line with the current political agenda of the EC. In comparison, the function of WRAP within the PSF was more of a knowledge broker and facilitator of detailed expert knowledge. It was possible for PSF members to share sensitive knowledge, as the expertise of WRAP as a knowledge broker helped to anonymise and keep the confidentiality of members. That said, the danger could be that the learning process of the collective occurs through filtered and pre-selected knowledge. This in turn can limit the aspect of creativity and lead to the development of less effective food sustainable solutions.

The theme on knowledge brokers and external experts was useful for understanding the role of centric actors in the learning process of collaborations. On the surface it appeared that the EC and WRAP share a similar role in being the 'ringmaster' within their collaboration. This research demonstrated that the roles are vastly different and even determine the organisational structure of collaborative learning and knowledge sharing.

The role of online and digital platforms in knowledge sharing and learning

The research findings have shown that both the SCP Roundtable and the PSF make extensive use of digital and online platforms for their collaborative work, including the exchange and presentation of their knowledge. This theme on the role of online and digital platforms was therefore essential in exploring the mechanisms behind collaborative knowledge hubs in the food system.

Through the researching of the publicly accessible online webpages, it was possible to gain an understanding concerning the content and structure of the collaborations' online presence. This included the way knowledge was presented and used for argumentation purposes in the context of food sustainability. The best evidence for this is the PSF Knowledge Base, an online platform that is used internally and externally as a virtual place of knowledge exchange and presentation on food sustainability. This however showed only one side of this theme. The interviews were a crucial additional method used to understand the perceptions and habits of individual members on using such virtual platforms for their collaborative learning.

The research revealed that most members regarded online platforms as useful assets in managing, organising and distributing large amounts of knowledge. At the same time, interviewees have expressed that they prefer face-to-face interactions such as physical workshops for collaborative learning. The analysis of the online material reflected that the two collaborative platforms presented themselves as users of virtual platforms for their collaborative learning. In fact, the interviews showed that digital and online platforms are less of a tool for collaborative learning. Their use and presence are likely to be an essential part for the image of the collaboration to the outside as a modern and forward-thinking group.

The organisation of existing knowledge

The interviews have shown that in the context of food sustainability, it is not only about the creation of new knowledge, but also about the organisation of existing knowledge. For interviewees, existing knowledge is already able to solve most of food sustainability challenges. Although most interviewees associated their collaborative knowledge activities as a process that predominantly leads to novel knowledge. The reason for this thinking could be that members have the perception that knowledge needs to be innovative and different from existing knowledge to drive change for food sustainability.

The research findings have particularly raised the question of whether the food system has the relevant knowledge needed to develop and implement solutions for food sustainability challenges. It also questions in the context of food sustainability, whether collaborative platforms are too strongly fixated on the creation of new knowledge, instead of considering already existing knowledge. As mentioned in this thesis, the danger can be that actors are left in a haze of ambiguity and struggle to identify relevant knowledge. In addition, this situation can add to the already existing confusion and uncertainty of what food sustainability entails, including the efforts of stakeholders to harmonise standards and definitions.

Organisational knowledge on food systems

The interviews from both case studies revealed that an overarching desire for the members was to gain knowledge that helps to understand processes, relationships, structures and interactions of the food system. These include interactions between actors and how these are embedded into the food value chain and the bigger picture of food sustainability.

This theme of organisational knowledge was useful in answering the second research question on the types of knowledge relevant for food related collaborative platforms. The theme captured that for many members it was not about a specific type of

knowledge, but rather different scientific, social and cultural forms of knowledge. The accumulation of these types of knowledge result in an understanding of how certain elements of the food system are organised. This view is interesting for research on food sustainability, as it demonstrates that a single type of knowledge requires context to be put into action. This context can be provided through the adaptation of other types of knowledge to reflect an overall picture of a food sustainability challenge.

The dominance of 'scientific knowledge'

The interviews and the document analysis have shown that 'scientific knowledge' is the most valued and used knowledge type for collaborative platforms when working on food sustainability. The focus on this theme helped to understand the reason behind this preference and the implications on food sustainability. The research findings have shown that food industry and government stakeholders particularly preferred tangible and 'scientific knowledge' as these were often perceived as robust and universally accepted.

This universal acceptance by many stakeholders gives 'scientific knowledge' a powerful position amongst other knowledge forms. According to most interviewees, statistics and science-based evidence are in most cases more powerful in political bargaining processes than other less tangible knowledge forms, such as feelings or perceptions. The use of the theme of 'scientific knowledge' helped to unveil that almost all solutions for sustainability challenges were developed through a science-based lens. The question that this theme raised is whether actors in the food system have a predefined perception that food sustainability challenges can only be solved through science. If so, this in turn would mean that social or cultural aspects are barley considered or even left out when working on food sustainability.

It might be that this affinity with science was specific to the two case studies of this research. If, however further research confirms that this perception is widely spread across stakeholders in the food system, it is alarming. Food sustainability is more than

just numbers, as there are strong cultural and social implications in relation to food. Leaving these aspects out from food sustainability can lead to the development of ineffective solutions.

Knowledge on the nexus of food sustainability and business

It was no surprise that the interviews and document analysis reflected a strong focus on economic prosperity for the two food industry led collaborations. This theme helped in particular to understand the implications of a business centric approach on food sustainability. This means that for the work of the PSF and SCP Roundtable on food sustainability, other key areas such as environmental protection or human health are reflected through a business conception.

Actions of the collaborative platforms that related to the improvement of social or environmental sustainability were justified through the relevance to specific food industry businesses interests. In turn, this also means that areas not regarded as business relevant were likely to be left out and de-prioritised. It can be argued that this prioritisation of economic interests is specific to the two case studies of this research, since they are industry led. At the same time, this is nothing unique to the two case studies as other collaborative platforms are likely to be centred around areas of food sustainability. For example, collaborative platforms that look predominantly at social aspects of food sustainability are likely to de-prioritise business elements.

The development of solutions for food sustainability challenges are likely to require a diverse pool of knowledge that considers many areas from business to social and cultural aspects. In conclusion, this theme of the nexus of business and food sustainability questions in a wider context, whether specialised collaborations are effective in findings solutions to food sustainability challenges. It is also important to consider that it is unlikely to have a food related collaboration that holistically focuses on all areas of food sustainability equally. Thus, this theme suggests that collaborations

are only a part within the food system for developing effective concepts that foster food sustainability.

Concrete and direct food policy recommendations

A key theme in relation to the impact of collaborative platforms on food sustainability was their involvement in policy recommendations. The research findings have shown that particularly for collaborative platforms that include government representatives and actors, such as food businesses and NGOs, there is an interest in impacting policy development. The findings suggest that there is no doubt that both the PSF and the SCP Roundtable have influenced national and European policies on food sustainability. In the case of the SCP Roundtable, their method of assessing environmental sustainability was even referenced by the EC as part of a policy recommendation.

The difficulty when researching this theme was to identify to what extent the two collaborations contributed to the development of policies on food sustainability. One reason for this was the difficulty of tracing what factors have played a role in developing and implementing a policy. This includes the role of external stakeholders such as collaborative groups in consulting government representatives.

In conclusion, the research has shown that the back-tracking of an impact on policy becomes even more challenging when considering the impact through knowledge. This includes knowledge that impacted the perceptions of policy makers that in turn led to considerations in the development of policies.

Improved understanding and exploration of food sustainability

The interviews with the members of the collaborations, as well as with external experts, demonstrated that the aspect of collaborating itself is a positive impact on food sustainability. The use of this theme was important for exploring the third research

question regarding the impact of collaborations on food sustainability. This theme particularly indicates that the act of collaborating across different stakeholders in the food system should not be taken for granted.

A living dialogue across stakeholders from food industry, government and civil society supports the exchange of stakeholder perceptions and fosters the awareness around sustainability within the food system and its stakeholders.

It is likely that the lack of transparent and honest dialogue between actors has led to uncoordinated actions and ultimately to unsustainable outcomes in the food system. The dialogue between stakeholders and the creation and exchange of food sustainability relevant knowledge can help to untangle the confusion around sustainability in the food system and can help to guide other stakeholders.

This theme of the improved understanding and exploration of food sustainability needs to be seen from a wider perspective. It is true, in the case of the two collaborations, the PSF and SCP Roundtable, that there is a dialogue between stakeholders. At the same time, the dialogue exists predominantly between like-minded stakeholders (here the food industry). These are not dialogues with strongly differing opinions and diverse actors. It can be assumed that for other collaborations the dialogue would predominantly occur between actors who share similar values and ideologies. Thus, collaborations in the food system foster the dialogue, but only with a limited pool of stakeholders. This in turn is unlikely to capture the spectrum of food sustainability challenges.

Voluntary industry led changes with the aim to improve food sustainability

The research findings have shown that there is a certain degree of mutual interest between government representatives and food industry stakeholders formed with the aim of avoiding introducing legislation. Instead, their desire is to implement voluntary industry agreements. Governments are in the position to impose legislation that can

force food industry actors to adopt sustainable practices. This approach, however, is also associated with financial and administrative burdens for governments, as legislation has to be implemented, observed and enforced. At the same time, for food industry actors, legislation that is made by policy makers is less likely to include industry friendly requirements. Voluntary agreements on the other hand, are less binding than legislations and offer the potential of a win-win situation between government and the food industry.

In conclusion, from a wider perspective the theme of voluntary industry led changes also raises concerns. The danger could be that pressingly needed food industry changes could be disregarded or softened through voluntary agreements. Even though the development and implementation of legislations are resource intensive for governments, it also gives a certain level of guarantee by forcing the food industry to more radical changes.

This theme has shown that developments and decisions within food sustainability could be conducted through an institutionalised voluntary based system between governments and the food industry. There are two sides to this. The benefit could be a realistic approach and strategy in policy development on food sustainability. The risk could be that the food industry can cherry-pick the changes and dictate their implementation. In turn, this can lead to ineffective actions in finding solutions to food sustainability challenges.

6.3 Reflections on research process

This section reflects on the research process and highlights aspects that have worked as anticipated by the researcher. This section also elaborates on other elements within the process that retrospectively could have been improved.

The theoretical and conceptual framework

The first part of this section reflects on the theoretical and conceptual framework that was used in this research. The literature that was used in the research in relation to collaborative multi-stakeholder groups guided me in the mapping and identification of different forums in the food system. The key challenge for the sourcing and analysis of the literature on collaborative platforms and collaborative learning was that most concepts and theories were developed through specific case studies. This was on the one hand appealing to me, as my research process also involved the investigation of collaborative learning in the food system through a case study approach. On the other hand, I was sceptical to what extent these theories and concepts on collaborative learning and knowledge utilisation are transferable to other collaborative groups, such as mine.

As a result, I used existing concepts and theories on collaborative learning, motives and knowledge utilisation as guidance. Throughout the research process I had to remind myself that some existing concepts that I was using on collaborations were based on specific case studies rather than universal theories.

Even though I found the available definitions on collaborative platforms often useful, they did not capture the existing real-world spectrum of collaborative platforms in the food system. For the conceptual and theoretical framework, I realised early that there is no true definition of what a collaborative platform is. I discovered that there is rather an accumulation of common characteristics that can be found within collaborative

forums. The mapping of different defining characteristics of collaborative platforms in Table 3.2 helped me to navigate through the vast amount of stakeholder groups in the food system. I was able to distinguish between those groups that I intended to study and others that appeared like an established, constant collaboration, but were rather forums of loose stakeholder engagements.

Material used to explore collaborative learning and knowledge transfer processes was in most cases useful, but at the same time there was no common conceptual theory that I was able to use on how collectives learn. It was at times challenging to identify the commonalities and differences of different concepts and theories on collaborative learning and to judge how common they are amongst collaborative platforms. I was therefore treating the analysed concepts and theories on collaborative learning equally during the research process and did not focus on a certain learning and knowledge transfer process. Even though I tried to explore collaborative learning processes within the food system openly, at the same time I was worried that I limited my exploration of collaborative learning to those concepts and theories that have been previously set out by author authors. This was particularly important as I was aware that in the literature most concepts and theories on collaborative learning have been developed through specific case studies. Thus, the outlined theories and concepts are to some extent specific to certain collaborations. I took the literature exploration as a guide to understand how collaborative learning can be investigated through a systematic approach.

I was aware at the start of this research that the exploration of knowledge itself is likely to be challenging as the term 'knowledge' can be perceived as vague and difficult to capture. It was therefore useful to explore the meaning and nature of knowledge in order to give that term some form of tangibility. At the same time, I was worried that I would explore collaborative knowledge predominantly through a predefined conceptual framework that classifies and constrains the scope of what can be defined as knowledge. Despite my desire to explore the term knowledge from a philosophical perspective, I was also in need of a tangible and pragmatic approach that would help me to capture and compare collaborative knowledge in the food system and food sustainability.

Similar to the term knowledge, there are no commonly agreed concepts and theories on food sustainability. The exploration of the term sustainability and contemporary food sustainability challenges helped me to understand the scope of sustainability in the food system according to key scholars. My aim was to show to the reader that there is a broad spectrum of what food sustainability entails and the level of complexity around food sustainability themes. This makes it challenging to pin down key areas of food sustainability. This understanding I gained through the literature review, helped me in the research process. I was able to discuss food sustainability from an open perspective without the assumption that a specific definition and set of characteristics of food sustainability could be found. I was rather making use of the fluidity that evolves around the term sustainability and accept that I had to take an open food systems approach for the exploration of food sustainability within collaborative platforms and their knowledge. Retrospectively, I could have also included the view of non-academic literature that related to contemporary food sustainability challenges. At the same time, I did not feel that they would have been appropriate for this research thesis based on their lack of validity and authenticity.

The case study design and used methods

The second part of this reflection focuses on the case study design and the two methods that have been used in the research project.

The case study design worked very well for the investigation of collaborative platforms and their knowledge within food sustainability. The focus on certain collaborative groups helped to gain a real-world understanding on how these groups operate and learn. In my research, I focused on the two-food industry led collaborations, the PSF and SCP Roundtable, over a period of 24 months. This time period and the selection of the PSF and SCP Roundtable were appropriate for the propose of this research project. Both the members of the PSF and SCP Roundtable were open and approachable throughout the research progress and most members showed the appropriate expertise in contributing to the research subject. Representatives of the PSF and SCP Roundtable

understood the purpose and aim of my research process, despite the potential of uncertainty or confusion concerning key terms, such as food sustainability, knowledge or collaborative learning.

Retrospectively, a number of aspects could have been improved in relation to the selection of the case studies and the time period of analysing these collaborative platforms. Firstly, the research project could have been improved by not only focusing on food industry led collaborative platforms. Even though both the PSF and SCP Roundtable are a multi-stakeholder platform, their members are predominantly from the food industry and thus are likely to mostly represent a food industry perspective within food sustainability. The case study approach could have benefited from focusing on a non-food industry led collaboration, as it would have widened the perspective on food related collaborations and given a more accurate representative of collaborative platforms in the food system. This aspect however would have made it challenging to relate the research findings from the case studies to each other if they were significantly different.

Methods used

Regarding document analysis, the analysed documents of the two case studies the PSF and SCP Roundtable were insightful and appropriate to the research questions. Documents produced by the two case studies helped to understand in an illustrative and tangible way their collaborative knowledge within food sustainability. The analysed documents were openly accessible and almost functioned as a snapshot in time of the collaborative work of the PSF and SCP Roundtable, capturing the types of knowledge that were perceived as critical within food sustainability. During the research progress, I had the impression that the document analysis could have been improved if I had analysed documents that were not only produced and published by the two case studies. Using third-party documents may have provided an illustration of the outside view of the two collaborations. Nevertheless, I found it appropriate and right to only include those documents that have been created by the two collaborations as the

principle aim of this research was to explore the PSF and SCP Roundtable's perceptions on what types of knowledge they find important within food sustainability. In addition, I found it useful during the document analysis to have a clear set of documents to analyse and focus upon as it gave the number of selected documents appropriate boundaries in relation to the expected duration of this research.

Overall, the anticipated data collection worked very well and an appropriate number of interviews and documents were gathered with a high level of quality and detail. As mentioned earlier in this section, the time period of the data collection could have been extended in order to capture more insights on the collaborative learning and knowledge transfer processes. I am aware that this research project with the data collection period of over 12 months is likely to capture predominantly short-term learning processes and exclude long term learning processes. Ideally, I could have analysed a collaborative platform from its established day and researched the collaborative learning and knowledge transfer processes throughout the existence of the collective. This approach however would have been not appropriate to the size and anticipated time frame of this research.

The majority of SCP Roundtable and PSF members, as well as external experts I intended to interview, were recruited within weeks and with no complications. Even though I aimed to have a face to face interaction with my interviewees, due to their high profile and busy schedule almost half of the interviews had to be conducted by phone. Despite the potential disadvantages of a phone interview that were outlined by the literature, I have not encountered any downsides compared to a face to face interview, as my interviewees were used to being interviewed through their day to day job, such as being a CEO or policy maker.

The interview process throughout this research worked well and all interviews were conducted successfully on the basis of a standardised open-ended interview style. The interview questions were understood by most interviewees, as indented by the researcher, and delivered comparable set of data across all interviewees. In some cases, I had to clarify during the interview process to the interviewee what I meant by

knowledge or learning which caused a conflictual situation for me as I did not want to influence the interviewee's own perceptions of what knowledge or learning means. Even though this was not often the case, I had to adapt to this situation by giving the interviewee enough guidance and at the same time does not influence the interview outcome. I explained to those interviewees that everyone has his or her own idea of what knowledge or learning is and that I am keen to understand what those of my interviewees are.

A further reflection on the interview process relates to the answers given by the members of the PSF and SCP Roundtable. In some cases, the interview process was challenging as I had to clarify the answers given by the members. I had to determine whether the answers were reflecting a personal or corporate/organisational opinion of the body members represent. Everyone within the PSF and SCP Roundtable that I interviewed attended the collaboration as an individual whilst representing an organisation, business or government body. My interview questions focused on the one side of food sustainability, which is from the perspective of an individual that represents an organisation and from a political point of view rather than a personal one. On the other side, interview questions that relate to learning and knowledge transfer are based on individual perceptions. When asking members about collaborative learning and knowledge within food sustainability, it was challenging in some cases to identify the intention of the answer that was given to me. In those circumstances I clarified by asking the same question differently at a later point of the interview.

During the document analysis, I reviewed documents that referred to various meetings and conferences of the PSF and the SCP Roundtable. I was aware that the research project could have been improved through an observation of the physical gatherings of members, such as internal meetings. This would have allowed me to observe how members learn from each other and what techniques are used to transfer knowledge across different stakeholders. However, at the beginning of the research project it was not guaranteed that I would have sufficient access to such internal meetings and on this basis, I decided to exclude the collection of data through observation. At the same time, I was worried that the observation of members would have been potentially

problematic as the appearance of the researcher could influence the natural learning behaviour of members in the collaboration. At a later stage of this research, I was invited to an internal meeting of the SCP Roundtable and was able to make some observations in relation to my research. I was however not able to use findings from this observation as I have not included this method of data collection in my application for ethical approval. Thus, the use of this data would breach the ethical consent given to me by the City University of London.

The data analysis approach that was taken in this research was very efficient, as it resulted in high-level insights on the research questions. It was useful to transcribe all the interviews as I was able to use the software NVivo to organise the transcripts and develop key themes through a systematic approach. I find it highly beneficial to have all the transcripts thematically connected and organised as it also helped me throughout the writing of the thesis to relate back to specific interviews during the discussion chapter. Through the transcription process and the systematic organisation of the transcripts, I felt comfortable capturing details from the interviews and also having the ability to read into the interviewees intentions.

Concluding with a final reflection on the research ethics, all interviewees felt comfortable being interviewed. The majority of interviewees felt comfortable to be named, but in some cases, interviewees requested to anonymise their company name. Since the research questions of this research project had no interest in the specific names of the interviewees nor the identity of their company or organisation, such identifying characteristics were excluded from the research thesis. Instead, interviewees were characterised by their sector and sometimes level of seniority, such as food and drink manufacturer or senior policy maker.

6.4 Recommendations from this research

Based on the research findings, this section outlines some recommendations on collaborative platforms and their role within food sustainability. The particular focus of

these recommendations are centred around values of the members and their collaborative learning and knowledge sharing activities.

Recommendations on the working of food-related collaborative platforms

Multi-disciplinary collaborative platforms are a good approach in creating and sharing a broad spectrum of knowledge. In relation to food sustainability, such diverse knowledge can help us to understand and bring solutions to problems and challenges. This research has shown that from a pragmatic point of view, collaborative multi-stakeholder learning, and knowledge sharing takes time and the created knowledge can be outdated. As such it can be ineffective in tackling certain food sustainability issues by the time the knowledge is created. It is therefore important for stakeholders who work collaboratively on food sustainability to be aware that their work is time-sensitive, including the creation of knowledge. They should aim to have mechanisms and procedures in place which encourage fast responses and actions with a fast turnover from ideas to concrete knowledge output. This quick action-oriented approach is necessary because of fast changing circumstances such as climate change and political stability that affect sustainability challenges.

Collaborations are a good way to develop and explore common responses to challenges in the food system. Turbulence can occur when stakeholders act independently in different directions and this behaviour might lead to unanticipated and dissonant consequences within a sector.

Effective communication techniques within collaborations are likely to be specific to each collaborative platform and their unique membership. The exploration of communication techniques and identification of suitable mechanisms can be as important as the content of the collaborative work. Thus, it should never be assumed that putting individuals into a room at a meeting or conference will automatically create an effective environment of knowledge exchange and learning.

Within collaborative platforms, knowledge of a scientific and numeric variety can be especially valuable. Statistics and data-driven knowledge are easy to transfer and often considered to be universal. Even though 'scientific knowledge' appears to be pragmatic, it is unlikely to be the only valid form of knowledge to tackle food sustainability challenges effectively. As food is partly a cultural exchange, in that consumers bring 'subjective' and societally learned meanings to their food habits, stakeholder forums must begin to accept the importance of cultural, social and emotional aspects of food sustainability.

Future research is needed to explore how to include and benefit from diverse perspectives on food sustainability. Food-related collaborative platforms can be either very specialised, such as being food industry specific, or broader and less specific in their membership and purpose. Both approaches have advantages and disadvantages. A specific collaboration is likely to be effective in communicating and exchanging knowledge and get to the core of certain food sustainability challenges. A broader collaboration with different stakeholders is likely to have the potential to capture a high volume of diverse knowledge but might get into difficulties over differences in communication and starting assumptions. This is particularly in line with Rayner's call for 'clumsy' arrangements that ensure uncomfortable knowledge is not excluded from policy debates. This is especially important when dealing with complex areas where the collaborative structure and processes exclude knowledge that is critical for understanding and addressing the problem (Rayner 2012).

Research is needed into whether hybrid forms of collaboration are possible and effective. A food related hybrid collaboration could be a predominant and specific platform, such as a food industry platform that includes only a small number of non-food industry and non-food stakeholders. Non-food industry stakeholders could be consumer representatives or NGOs, whereas non-food stakeholders could be from the car, entertainment or sports sector.

<u>Recommendations to food industry</u>

It is clear from the research presented here that there is considerable interest and growing experience of collaborative knowledge exchange over sustainability issues within food business sectors. It could be argued that these are simply companies looking after their own interests, protecting brands and reducing reputational risks. But this misses the point. Food companies have real interest in maintaining the economic viability. Collaborative knowledge exchange ought to be more widespread than it currently is within the food system. Their fear is that this is seen as anti-competitive behaviour or economic collusion. Only government support for collaborative knowledge exchange can reduce that brake on activity. Another recommendation is to give attention to smaller food businesses. They can easily be left out of knowledge hubs. They have extra pressures on time, costs and expertise. Yet collaborative platforms can be beneficial for such small industry actors.

A difficulty for food industry stakeholders is the lack of trust between them and civil-society actors. Efforts must be made to build trust. This could be fostered if industry actors guarantee that civil-society stakeholders will be heard and that their views will be clearly reflected in final reports from the collaboration.

Recommendations to government

Government is in a strong position as only it has the legitimacy to set the framework within which full engagement can optimally occur. Food sustainability challenges need that full engagement. No single actor is likely to have the required knowledge to develop and implement effective solutions to current and future food sustainability challenges. Governments can bring people together and provide a dialogue with a wide range of stakeholders.

At the same time, governments must be aware that when participating within a multi-stakeholder collaboration as a neutral actor, their presence alone can influence the way other members act within the collective. They must be open about their facilitating role alongside their wider policy aims. While it is impossible for governments to be ‘neutral’,

they can be open about the need to be sound and rationale on the basis for collaboration.

Recommendations to civil society

Civil society organisations, such as consumer representatives or non-governmental organisations already make significant contributions to food sustainability. The research conducted here into the two collaborations PSF and SCP Roundtable found low representation of civil-society actors, yet there was a desire to have civil-society actors involved. The interviews showed that participants knew that the involvement of civil-society actors would help industry led collaborations to gain stronger public legitimacy. This desire meets a block due to lack of trust. This trust gap can potentially be narrowed through governmental legitimacy that could bring NGOs into the collaborative process more easily.

But also, more research is needed into what could be done to increase civil society involvement in industry or multi-disciplinary knowledge hubs. The problem could be one of scale whereby only big centrist NGOs see the value of involvement. It could be argued that participation in knowledge collaboration offers civil-society actors the opportunity to have dialogue with both food industry and government away from the public eye. This could be done by having a neutral ringmaster in place that ensures a certain level of equality and democracy within the collective.

6.5 Future research

This research highlighted the area of collaborative platforms in the food system with a focus on how they learn and how their knowledge impacts food sustainability. At the same time, the contributions from this research have raised further questions that should be explored through future research. Particularly the two collaborations, the Sustainable Agriculture Initiative Platform (SAI) and the Horizon 2020 Advisory Group,

have been mentioned by some members and external experts that have been interviewed (7C, 1GE, 7IU, 1IE). A key reason for this is that several actors along the food value chain hold multiple memberships in different collaborative platforms. The SAI Platform was created in 2002 by Nestlé, Unilever and Danone and focuses on sustainable agriculture and includes actors from the primary value chain. The Horizon 2020 Advisory Group is based on the Horizon 2020 project which is the largest EU funded research and innovation programme organised in different advisory groups. It would be interesting to explore how other collaborative platforms that hold a more diverse membership than the PSF and SCP Roundtable learn and utilise their collaborative knowledge in food sustainability.

Furthermore, the PSF and the SCP Roundtable operated with a high level of administrative processes as members wanted to ensure transparency throughout the different stages of their collaborative work. This raised the question of whether smaller and more locally held collaborative multi-stakeholder platforms with less administrative procedures would use different and more progressive processes of collaborative learning. It would be interesting to explore how the knowledge of such collaborations is utilised to foster local food sustainability and if these insights can be applied to a larger proportion of the food system.

The research revealed that both the PSF and SCP Roundtable predominantly focus on scientific, technical and economically relevant knowledge within food sustainability. This correlation of certain types of knowledge and food sustainability requires a deeper understanding. More research needs to be done on the wider implications on the role of scientific, technical and economical knowledge within food sustainability and how food policies are influenced by that.

The collaborative learning and knowledge transfer processes that were developed in this thesis and outlined in Chapter V have contributed to the understanding of collaborative knowledge in the food system and food sustainability. Specific collaborative learning processes, such as learning through joint case studies, require

more in depth and focused research. This research project indicates that there are useful and important elements within some of these collaborative learning processes that can help and guide a wide range of stakeholders that work on food sustainability in the food system. Research for example, that explores a variety of joint multi-stakeholder case studies and how in detail different stakeholders learn from each other and how that knowledge, is later used to foster sustainability within the food system.

There is a need for ongoing research in the field of food sustainability and collaborative multi-stakeholder engagements. The rising complexity of current and future food sustainability challenges and the 'messiness' of the food system itself foster stakeholders to work together. Even competing food industry actors start to collaborate in certain areas as they foresee potential areas of risk for their businesses. Thus, collaborative platforms in the food system are not a rare occurrence, and it is likely that more multi-stakeholder collaborations will emerge in the future on local, national and international levels.

Bibliography

Abma, T.A., (2003). *Learning by telling storytelling workshops as an organizational learning intervention*. Management Learning. **34**(2), 221–240.

Adger, W. N. and Jordan, A., (2009). *Sustainability: Exploring the process and outcomes of governance in Governing sustainability*. New York: Cambridge University Press. pp. 3-31

Aiking, H. and De Boer, J., (2004). *Food sustainability: Diverging interpretations*. *British Food Journal* **106**(5), pp. 359–365.

Alavi, M. and Leidner, D.E. (2001). *Knowledge management and knowledge management systems: conceptual foundations and research issues*. *MIS Quarterly*. **25**, pp. 107–136.

Allred, B.B. (2001). *Enabling Knowledge Creation: How to unlock the Mystery of Tacit Knowledge and Release the Power of Innovation*. Academy of Management Executive. **15**, pp. 161–162.

Allen, P. and Sachs, C., (1993). *Sustainable agriculture in the United States: Engagements, silences, and possibilities for transformation*. Food for the future: Conditions and contradictions of sustainability, pp.139-167.

Althusser, L. (1976). *Essays on Ideology*. London: Verso.

Amess, K., Stiebale, J. and Wright, M., (2016). *The impact of private equity on firms' patenting activity*. European Economic Review. **86**, pp.147-160.

Anderson, D. and Lee, H., (2001). *New supply chain business models–the opportunities and challenges* [online]. Achieving Supply Chain Excellence Through Technology. Available from: https://supplychainventure.com/PDF/ASCET2001final.pdf.

Andraski, J.C. (1998). *Leadership and the realization of supply chain collaboration. Journal of Business logistics*. **19**(2), pp.9-11.

Anon and Smith, M. (2000). C*hris Argyris: Theories of Action, Double-Loop Learning and Organizational Learning* [online]. INFED. [Viewed 14 February 2016]. Available from: http://infed.org/mobi/chris-argyris-theories-of-action-double-loop-learning-and-organizational-learning/.

Ansell, C. and Gash, A. (2008). *Collaborative governance in theory and practice. Journal of Public Administration Research and Theory*. **18**, pp. 543–571.

Argyris, C. (1991). *Teaching smart people how to learn*. Harvard business review **69**(3).

pp.4-15.

Argyris, C. and Schon, D.A. (1974). *Theory in practice: Increasing professional effectiveness*. San Fransisco: Jossey-Bass.

Azevedo, S., Silva, M., Matias, J. and Dias, G., (2018). *The Influence of Collaboration Initiatives on the Sustainability of the Cashew Supply Chain*. Sustainability. **10**(6), p.2075.

Bäckstrand, K. (2003). *Civic science for sustainability: reframing the role of experts, policy-makers and citizens in environmental governance*. Global Environmental Politics. **3**(4), pp. 24–41.

Bäckstrand, K. (2010). *Environmental Politics and Deliberative Democracy: Examining the Promise of New Modes of Governance. Cheltenham*: Edward Elgar Publishing Limted.

Balabanov, V., Balabanova, A. and Dudin, M., (2015). *Social responsibility for sustainable development of enterprise structures*. Asian Social Science. **11**(8), pp.111-118.

Baldwin, C.J., (2011). *Sustainability in the Food Industry*. Iowa: Wiley-Blackwell.

Balkau, F. and Grant, T., (2018). *Life Cycle Approaches to Sustainable Regional Development*. In Designing Sustainable Technologies, Products and Policies. pp. 433-438.

Banerjee, S.B., (2003). *Who sustains whose development? Sustainable Development and the reinvention of nature*. Organisation Studies. **24**(1), pp 143-180.

Barling, D., Lang, T. and Sharpe, R., (2010). T*he re-emergence of national food security on the United Kingdom's strategic policy agenda: Sustainability challenges and the politics of the food supply*. In: Food security, nutrition and sustainability, eds. G. Lawrence, K. Lyons and T. Wallington. London: Earthscan. pp. 61-78.

Barling, D. and Duncan, J., (2015). *The dynamics of the contemporary governance of the world's food supply and the challenges of policy redirection*. Food Security. **7**(2), 415–424.

Barry, B., (1999). *Sustainability and intergenerational justice*. In: Fairness and futurity: Essays on environmental sustainability and social justice, ed. A. Dobson. Ofxford: Oxford University Press. pp. 93-117.

Baumgartner, F.R. and Jones, B.D., (2010). *Agendas and Instability in American Politics, Second Edition*. Chicago: University of Chicago Press.

Bell, S. and Hindmoor, A., (2009). *Rethinking Governance: The Centrality of the State in Modern Society*. Sydney: Cambridge University Press.

Bellarby, J., Foereid, B., Hastings, A F S J and Smith, P., (2008). *Cool Farming : Climate impacts of agriculture and mitigation potential*. Amsterdam: Greenpeace International.

Berkes, F., (1985). *Fishermen and 'the tragedy of the commons'. Environmental conservation*. **12**(03), pp. 199–206.

Beske, P., Land, A. and Seuring, S., (2014). S*ustainable supply chain management practices and dynamic capabilities in the food industry: A critical analysis of the literature*. International Journal of Production Economics. **152**(C), pp. 131–143.

Bevir, M., (2008). *Key Concepts in Governance*. London: SAGE Publications.

Bieler, A., Higgott, R. and Underhill, G., (2004). *Non-State Actors and Authority in the Global System*. New York: Taylor & Francis.

Birkland, T.A., (2007). *Agenda setting in public policy. Handbook of public policy analysis*. Theory, politics, and methods. **125**, pp. 63–78.

Bitsch, V., (2010). *Labor aspects of sustainability*, paper presented at: The 20th Annual World Forum and Symposium of the International Food and Agribusiness Management Association in Boston, Mass, June 19-22, 2010.

Bizer, K. and Julich, R., (1999). *Voluntary agreements - trick or treat?*. European Environment. **9**, pp. 59–66.

Blay-Palmer, A. and Koc, M., (2010). *The path to regenerative food systems. In: Imagining sustainable food systems*. Abbingdon: Routledge, pp. 233-246.

Bohm, D., (2013). *On Dialogue*. London: Taylor & Francis.

Boisot, M., (1998). *The information perspective. In: Knowledge Assets: Securing Competitive Advantage in the Information Economy*. Oxford: Oxford University Press. pp. 36-40

Bowen, G.A., (2009). *Document analysis as a qualitative research method. Qualitative research journal*. **9**(2), pp. 27–40.

Bramley, G. and Power, S., (2009). *Urban form and social sustainability: the role of density and housing type*. Environment and Planning B: Planning and Design. **36**(1), pp.30-48.

Brandt, W., (1980). *North-South: A programme for survival*. London: Pan.

Brooking, A., (1997). *Intellectual Capital: Core Assets for the Third Millennium Enterprise. Barcelona*. Boston: Thomson Learning.

Brundtland Commission, (1987). *Our Common Future.* New York: UN Documents.

Bryant, T., (2002). R*ole of knowledge in public health and health promotion policy change*. Health Promotion International. **17**, pp. 89–98.

Bryman, A., (2015). *Social research methods*. Oxford: Oxford university press.

Byrne, B. (2004). *Qualitative interviewing*. Researching society and culture. **2**, pp. 179–192.

Cairney, P., (2012). U*nderstanding public policy*. New York: Palgrave Macmillan.

Capello, F., Toja, M. and Trapani, N., (2016). *A real-time monitoring service based on industrial internet of things to manage agrifood logistics*. 6th International Conference on Information Systems, Logistics and Supply Chain. pp. 10-21.

Caradonna, J.L., (2014). *Sustainability: A history*. New York: Oxford University Press.

Cardello, A. V., (2007). *Measuring consumer expectations to improve food product development*. In: Consumer-led food product development. Cambridge: Woodhead Publishing, pp. 223–261.

Carson, R., (1962). *Silent Spring*. New York: Fawcett Crest.

Chilvers, J., (2008). *Environmental risk, uncertainty, and participation: mapping an emergent epistemic community*. Environment and planning. **A40**(12), p. 2990.

Clarke, S. and Roome, N., (1999). S*ustainable business: Learning - action networks as organizational assets*. Business Strategy and the Environment. **8**, pp. 296–310.

Clarke, S. and Roome, N., (1995). *Managing for environmentally sensitive technology: networks for collaboration and learning*. Technology Analysis & Strategic Management. **7**, pp. 191–216.

Cobb, R.W., (1983). *Participation in American politics: The dynamics of agenda-building*. Baltimore: Johns Hopkins University Press.

Cohen, M.D., March, J.G. and Olsen, P.J., (1972). *A garbage can model of organizational choice*. Administrative science quarterly , pp. 1–25.

Cohen, W.M. and Levinthal, D.A., (1990). *Absorptive capacity: a new perspective on learning and innovation*. Administrative science quarterly 35, pp. 128–152.

Colantonio, A., Dixon, T., Ganser, R., Carpenter, J. and Ngombe, A., (2009). *Measuring Socially Sustainable Urban Regeneration in Europe*. Oxford: Oxford Institute for Sustainable Development (OISD).

Collins, H., (2007). *Bicycling on the moon: collective tacit knowledge and somatic-limit*

tacit knowledge. *Organization Studies* **28**(2), pp. 257–262.

Commission of the European Communities, (2002). *Corporate social responsibility – main issues*. Brussels: MEMO/02/153.

Cook, F.L., Tyler T.R., Geotz, E.G., Gordon, M.T., Protess, D., Leff, D.R. and Molotch, H.L., (1983). *Media and agenda setting: Effects on the public, interest group leaders, policy makers, and policy*. Public Opinion Quarterly **47**(1), pp. 16–35.

Costanza, R., Cumberland J.H., Daly, H., Goodland, R., Norgaard, R.B., Kubiszewski I. and Franco C., (2014). *An introduction to ecological economics*. London: CRC Press.

Crossan, M.M., Lane, H.W., White, R.E. and Djurfeldt, L., (1995). *Organizational learning: dimensions for a theory*. International Journal of Organizational Analysis **3**, pp. 337–360.

Csurgó, B., Kovach, I. and Kucerova, E., (2008). *Knowledge, Power and Sustainability in Contemporary Rural Europe*. Sociologia Ruralis **48**(3), pp. 292–312.

Da Silva, M.E., de Oliveira, A.P.G. and Gómez, C.R.P., (2013). *Can collaboration between firms and stakeholders stimulate sustainable consumption? Discussing roles in the Brazilian electricity sector*. Journal of cleaner production, **47**, pp.236-244.

Dahlsrud, A., (2008). *How corporate social responsibility is defined: An analysis of 37 definitions*. Corporate social responsibility and environmental management. **15**(1), pp.1-13.

Dant, T., (2013). *Knowledge, Ideology, and : A Sociological Perspective*. London: Routledge.

De Vaus, D.A. and de Vaus, D., (2001). *Research design in social research*. London: Sage Publications Ltd.

Defra, (2006). *Food Industry Sustainability Strategy*. London: Department for environment, food and rural affairs.

Dempsey, N., Bramley, G., Power, S. and Brown, C., (2011). *The social dimension of sustainable development: Defining urban social sustainability*. Sustainable development. **19**(5), pp.289-300.

Denise, L., (2010). *Collaboration vs. C-Three (Cooperation, Coordination, and Communication)*. *Innovating.* **7**, pp. 1–6.

Ding, H., Huang, H. and Tang, O., (2018). *Sustainable supply chain collaboration with outsourcing pollutant-reduction service in power industry*. Journal of Cleaner Production. **186**, pp.215-228.

Dolan, P., Peasgood, T., Dixon, A., Knight, M., Phillips, D., Tsuchiya, A. & White, M. (2006), R*esearch on the relationship between wellbeing and Sustainable Development: Final report for Defra*. London: Department for the Environment, Food and Rural Affairs.

Doppelt, B., (2009). L*eading Change Toward Sustainability - 2nd Edition: A Change-Management Guide for Business*. Government and Civil Society. London: Routledge.

Dyllick, T. and Hockerts, K., (2002). *Beyond the business case for corporate sustainability*. Business strategy and the environment. **11**(2), pp.130-141.

Dyllick, T. and Muff, K., (2016). *Clarifying the meaning of sustainable business: Introducing a typology from business-as-usual to true business sustainability*. Organization & Environment. **29**(2), pp.156-174.

Environmental Audit Committee, (2004). *The Sustainable Development strategy: Illusion or reality?*. London: The Stationery Office.

Emas, R., (2015). *The concept of sustainable development: definition and defining principles*. Brief for GSDR, pp.1-3.

Emery, F.E., (1965). *The Causal Texture of Organizational Environments*. Human Relations. **18**, pp. 21–32.

European Comission, (2012). *Product Environmental Footprint (PEF) Guide* [online]. Brussels: European Commission joint research centre. Available from: http://ec.europa.eu/environment/eussd/pdf/footprint/PEF%20methodology%20final%20draft.pdf.

Fadeeva, Z., (2005). *Promise of sustainability collaboration - Potential fulfilled?*. Journal of Cleaner Production. **13**, pp. 165–174.

Feenstra, G., (2002). *Creating space for sustainable food systems: Lessons from the field*. Agriculture and human values. **19**(2), pp.99-106.

Feldman, M.S., Khademian A.m. and Quick K.S., (2009). *Ways of knowing, inclusive management, and promoting democratic engagement*: Introduction to the special issue. International Public Management Journal. **12**(2), pp. 123–136.

Flick, U., (2009). *An introduction to qualitative research*. Hamburg: Sage.

Floridi, L., (2004). *The Blackwell Guide to the Philosophy of Computing and Information*. Oxford and Malden: Blackwell.

Fonte, M., (2008). *Knowledge, food and place. A way of producing, a way of knowing*. Sociologia Ruralis. **48**(3), pp. 200–222.

Foucault, M., (1977). *Critical theory/intellectual history. Politics, philosophy, culture*: Interviews and other writings 1984. pp. 17–46.

Foucault, M., (1980). *Power/Knowledge: Selected Interviews and Other Writings*. Essex: Harvester Wheatsheaf.

Foucault, M., (2000). *Power*. Edited by James D. Faubion. New York: New Press.

Furrer, O., (2016). *Corporate level strategy. Theory and applications*. London: Routledge.

Funke, M., (2013). *Advocacy Coalitions and Strategic Interests: The Policy Process of Swedish Self-Regulation of Advertising 1950-1971*. In: Lindberg, H. ed. Knowledge and Policy Change. Newcastle upon Tyne: Cambridge Scholars Pub, pp. 131–169.

Gaventa, J. and Cornwall, A., (2008). *Power and knowledge. The Sage handbook of action research*: Participative inquiry and practice. **2**, pp. 172–189.

Georges L. Romme, A. and Van Witteloostuijn, A., (1999). Circular organizing and triple loop learning. Journal of Organizational Change Management. **12**(5), pp. 439–454.

Gereffi G and K Fernandez-Stark (2011). *Global value chain analysis: a primer*. Durham NC: Duke University Center on Globalization, Governance & Competitiveness (CGGC).

Germany Trade and Invest, (2014). *INDUSTRIE 4.0 Smart Manufacturing for the Future*. [online]. Germany Trade and Invest. [Viewed 24 Februar 2019]. Available from: https://www.manufacturing-policy.eng.cam.ac.uk/documents-folder/policies/germany-industrie-4-0-smart-manufacturing-for-the-future-gtai/at_download/file.

Gibson, R.B., (2006). *Beyond the pillars: sustainability assessment as a framework for effective integration of social, economic and ecological considerations in significant decision-making*. Journal of Environmental Assessment Policy and Management. **8**(3), pp. 259-280.

Gillham, B., (2000). *Case study research methods*. London: Bloomsbury Publishing.

Golafshani, N., (2003). *Understanding reliability and validity in qualitative research*. The qualitative report. **8**(4), pp. 597–606.

Goodland, R. and Daly, H., (1996). *Environmental sustainability: universal and non-negotiable*. Ecological applications. **6**(4), pp.1002-1017.

Goodman, D. and Watts, M., (1997). *Globalising Food: Agrarian Questions and Global Restructuring*. London and New York: Routledge.

Gray, B., (1985). *Conditions Facilitating Interorganizational Collaboration*. Human

Relations. **38**, pp. 911–936.

Gray, B., (1989). *Collaborating: finding common ground for multiparty problems*. San Fransisco: Jossey-Bass.

Gray, B., (2000). *Assessing inter-organizational collaboration: Multiple conceptions and multiple methods*. In: Perspectives on collaboration. New York: Oxford University Press.

Gray, B., (2003). *Framing of environmental disputes. In: Roy Lewicki, Barbara Gray, M. E. ed. Making sense of intractable environmental conflicts: Concepts and cases*. Washington DC: Island Press. pp. 11-34

Grunert, K.G., Hieke S. and Wills J., (2014). *Sustainability labels on food products: Consumer motivation, understanding and use*. *Food Policy.* **44**, pp. 177–189.

Gupta, J., (2004). *Global sustainable food governance and hunger: Traps and tragedies*. British Food Journal. **106**(5), pp. 406–416.

Haas, P.M., (1992). *Introduction: epistemic communities and international policy coordination*. International Organization. **46**, p. 1.

Hall, R., (1998). *Information Space; a framework for learning in organisations, institutions and culture*. Supply Management. **3**, p. 35.

Halme, M., (2001). *Learning for sustainable development in tourism networks*. Business Strategy and the Environment. **10**, pp. 100–114.

Halme, M. and Fadeeva, Z., (2000). *Small and medium-sized tourism enterprises in sustainable development networks: Value added?*. Greener Management International. **1**, pp. 97–113.

Hamel, G., (1991a). C*ompetition for Competence and Inter- Partner Learning Within International*. *Strategic Management Journal.* **12**, pp. 83–103.

Hamel, G. (1991b). C*ompetition for competence and interpartner learning within international strategic alliances*. Strategic Management Journal. **12**, pp. 83–103.

Hamprecht, J., Corsten, D., Noll, M. and Meier, E., (2005). *Controlling the sustainability of food supply chains*. Supply Chain Management: An International Journal. **10**(1), pp. 7–10.

Hardin, G., (1968). T*he Tragedy of the Commons*. *Science.* **162**, pp. 1243–1248.

Hicks, D., (1995). P*ublished papers, tacit competencies and corporate management of the public/private character of knowledge*. Industrial and corporate change. **4**(2), pp. 401–424.

Hilgartner, S. and Bosk, C.L., (1988). T*he rise and fall of social problems: A public arenas model*. American journal of Sociology. **94**(1), pp. 53–78.

Hinrichs, C.C. and Lyson, T.A., (2007). *Remaking the North American Food System: Strategies for Sustainability*. University of Nebraska Press.

Hopkins, R.F., (1992). *Reform in the international food aid regime: the role of consensual knowledge*. International Organization. **46**, p. 225.

Hoppe, R., (2005). R*ethinking the science-policy nexus: From knowledge utilization and science technology studies to types of boundary arrangements. Poiesis und Praxis.* **3**, pp. 199–215.

Hopwood, B., Mellor, M. and O'Brien, G., (2005). *Sustainable development: mapping different approaches*. Sustainable development. **13**(1), pp.38-52.

Hsieh, H.-F. and Shannon, S.E., (2005). *Three approaches to qualitative content analysis*. Qualitative health research. **15**(9), pp. 1277–1288.

Huang, K.F. and Yu, C.M.J., (2011). *The effect of competitive and non-competitive R&D collaboration on firm innovation*. *Journal of Technology Transfer.* **36**, pp. 383–403.

Hustedt, T., (2013). Institutions and forms of knowledge: Organizing policy advice. In: Lindberg, H. ed. *Knowledge and Policy Change*. Newcastle upon Tyne: Cambridge Scholars Publisher, pp. 42–59.

Huxham, C. (1996). C*ollaboration and Collaborative Advantage. In: Creating Collaborative Advantage*. London: Sage Publications. pp.1-18

Huxham, C. and Vangen, S., (2013). *Managing to collaborate: The theory and practice of collaborative advantage*. Oxon: Routledge.

Ingram, V., (1999). *From sparring partners to bedfellows: Joint approaches to environmental policy-making*. European Environment. **9**, pp. 41–48.

Inkpen, A.C. and Tsang, E.W.K., (2005). *Social capital networks, and knowledge transfer*. *A*cademy of Management Review. **30**, pp. 146–165.

Innes, J.E., (1990). *Knowledge and Public Policy: The Search for Meaningful Indicators*. New Jersey: Transaction Publishers.

Innes, J.E. and Booher, D.E., (2000). *Collaborative Dialogue as a Policy Making Strategy*. Deliberative Policy Analysis: Understanding Governance in the Network Society.

Innes, J.E. and Booher, D.E., (2010). *Planning with complexity: An introduction to collaborative rationality for public policy*. New York: Routledge.

Isaacs, W., (1999). *Dialogue and the Art of Thinking Together*. New York: Crown Business.

ISSC., (2013). *World Social Science Report 2013*: Changing global environments, OECD Publishing and UNESCO Publishing.

IUCN, UNEP and WWF, (1980). *World conservation strategy: Living resource conservation for Sustainable Development, IUCN; UNEP; WWF, Gland, Switzerland*: IUCN.

James, P., (2014). *Urban sustainability in theory and practice: circles of sustainability*. Oxon: Routledge.

Jasanoff and Jasanoff, S., (2004). *States of Knowledge: The Co-Production of Science and the Social Order*. London: Taylor & Francis.

Jasanoff, S., (1997). *NGOs and the environment: from knowledge to action*. Third World Quarterly. **18**(3), pp. 579–594.

Jasanoff, S., (2009). *The fifth branch: Science advisers as policymakers*. Cambridge and London: Harvard University Press.

Jasanoff, S., (2013). E*pistemic Subsidiarity - Coexistence, Cosmopolitanism, Constitutionalism Transnational Risks and Multilevel Regulation: A Cross-Comparative Perspective*. European Journal of Risk Regulation. **4**, pp. 133–142.

Johnson, D.W. and Johnson, F.P., (1991). *Joining together: Group theory and group skills*. Essex: Prentice-Hall Inc.

Jones, B.D. and Baumgartner, F.R., (2012). *From there to here: Punctuated equilibrium to the general punctuation thesis to a theory of government information processin*g. Policy Studies Journal. **40**, pp. 1–20.

Jordan, A., Wurzel, R.k.w. and Zito, A., (2005). *The rise of 'new'policy instruments in comparative perspective: has governance eclipsed government?*. Political studies. **53**(3), pp. 477–496.

Kabu, E. and Tira, D.S., (2015). *Value Chain Analysis Towards Sustainability: A Case Study of Fishery Business in Kota Kupang, Indonesia*. International Journal of Economics and Financial Issues. **5**(1S), pp.150-156.

Karlson, N., (2013). *The limits of pragmatism in institutional change. In: Knowledge and Policy Change*. Newcastle upon Tyne: Cambridge Scholars Publisher, pp. 10–21.

Kates, R., Parris, T. and Leiserowitz, A.A., (2005). W*hat is Sustainable Development? Goals, indicators, values and practice*. Environment: Science and policy for Sustainable Development. **47**(3), pp. 8-21.

Keating, M., (2010). *Rethinking Governance: The Centrality of the State in Modern Society by Stephen Bell and Andrew Hindmoor*. Australian Journal of Public Administration. **69**(1), pp. 103–106.

Kjaer, A.M., (2009). *Governance and the urban bureaucracy*. In: Theories of urban politics. London: Sage, pp. 137–168.

Kloppenburg Jr, J., Lezberg, S., De Master, K. and Stevenson, G.W., (2000). *Tasting Food, Tasting Sustainability: Defining the Attributes ofan Alternative Food System with Competent, Ordinary People*. Human organization. **59**(2), pp.177-186.

Knight, L., (2002). *Network Learning: Exploring Learning by Interorganizational Networks*. Human Relations. **55**, pp. 427–454.

Kocmanová, A., Pavláková Dočekalová, M., Škapa, S. and Smolíková, L., (2016). *Measuring corporate sustainability and environmental, social, and corporate governance value added*. Sustainability. **8**(9), p.945.

Krippendorff, K., (2012). *Content analysis: An introduction to its methodology.* London: Sage.

Kuhlman, T. and Farrington, J., (2010). *What is sustainability?*. Sustainability. **2**(11), pp.3436-3448.

Kuhn, T.S., (1996). *The structure of scientific revolutions. Chicago and London: Chicago Press.*

Lafferty, W.M., (2006). *Governance for Sustainable Development: The Challenge of Adapting Form to Function*. Cheltenham: Edward Elgar Publishing.

Landrum, N.E., (2018). *Stages of corporate sustainability: Integrating the strong sustainability worldview*.Organization & Environment. **31**(4), pp.287-313.

Lane, P.J., Salk, J.E. and Lyles, M.A., (2001). *Absorptive capacity, learning, and performance in international joint ventures*. Strategic Management Journal. **22**, pp. 1139–1161.

Lang, T., (1999). *The complexities of globalization: The UK as a case study of tensions within the food system and the challenge to food policy*. Agriculture and Human Values. **16**(2), pp. 169–185.

Lang, T., Barling, D. and Caraher, M., (2001). *Food, Social Policy and the Environment: Towards a New Model*. Social Policy & Administration. **35**, pp. 538–558.

Lang, T., (2012). *Food industrialisation and food power: implications for food governance*. New York: Routledge.

Lang, T., (2008). *Sustainable Development" in Organising words: a creative thesaurus for social and organisation studies*, ed. Y. Gabriel. Oxford: Oxford University Press.

Lang, T. Barling, D. and Caraher, M., (2009). *Food Policy: Integrating Health, Environment and Society*. Oxford: Oxford University Press.

Lang, T. and Barling, D. 2012. *Food security and food sustainability: reformulating the debate*. The Geographical Journal**. 178**(4), pp. 313–326

Lang, T. and Heasman, M., (2004). *The food wars thesis*. London: Earthscan

Lei, D., Slocum J.W. and Pitts, R.A., (1997). *Building cooperative advantage: Managing strategic alliances to promote organizational learning*. Journal of World Business. **32**, pp. 203–223.

Lawrence, G., Lyons, K. and Wallington, T., (2010). *Introduction: Food security, nutrition and sustainability in a globalised world" in Food security, nutrition and sustainability*, (eds) Lawrence, G., Lyons, K. & Wallington, T. London: Earthscan, London, pp 1-23.

Leach, M., Rockström, J., Raskin, P., Scoones, I.C., Stirling, A.C., Smith, A., Thompson, J., Millstone, E., Ely, A., Arond, E. and Folke, C., (2012). *Transforming innovation for sustainability*. Ecology and Society. **17**(2), p.11.

Lewicki, R., (2002). *Making sense of intractable environmental conflicts: Concepts and cases*. Washington DC: Island Press.

Liebowitz, J., (1999). *Knowledge Management Handbook*. London: CRC Press.

Lincoln, Y.S. and Guba, E.G., (1985). *Naturalistic inquiry*. London: Sage.

Lindberg, H., (2013). *Knowledge and Policy Change*. Newcastle upon Tyne: Cambridge Scholars Publisher.

Linnemann, A.R., Benner, M., Verkerk, R. and Boekel M.A.J.S., (2006). *Consumer-driven food product development*. Trends in Food Science & Technology. **17**(4), pp. 184–190.

Littig, B. and Griessler, E., (2005). S*ocial sustainability: a catchword between political pragmatism and social theory*. International journal of sustainable development. **8**(1-2), pp.65-79.

Lozano, R., (2007). *Collaboration as a pathway for sustainability*. Sustainable Development*.* **15**, pp. 370–381.

Lozano, R., (2008). *Developing collaborative and sustainable organisations*. Journal of Cleaner Production. **16**, pp. 499–509.

Lozano, R., (2014). *Creativity and Organizational Learning as Means to Foster Sustainability*. Sustainable Development. **22**(3), pp. 205–216.

Magis, K. & Shinn, C., (2009). *Emergent principles of social sustainability. In:Understanding the social dimension of sustainability, eds. J. Dillard, V. Dujon & M.C. King*. New York and London: Routledge, pp. 16-44.

Maloney, W.A., Jordan, G. and McLaughlin, A.M., (1994). *Interest Groups and Public Policy: The Insider/Outsider Model Revisited*. Journal of Public Policy. **14**(01), pp. 17–38.

Maloni, M.J. and Brown, M.E., (2006). *Corporate Social Responsibility in the Supply Chain: An Application in the Food Industry*. Journal of Business Ethics. **68**(1), pp. 35–52.

Malthus, T.R., (1817). *An essay on the principle of population, as it affects the future improvement of society. With remarks on the speculations of mr. Godwin, m. Condorcet, and other writers*. London: W. Clowes.

Markley, M.J. and Davis, L., (2007). E*xploring future competitive advantage through sustainable supply chains. International Journal of Physical Distribution & Logistics Management*. **37**(9), pp. 763–774.

Marsden, T.K. and Morley, A., (2014). *Current food questions and their scholarly challenges, in: Sustainable food systems: Building a new paradigm, eds Marsden, T. K. & Morley*. London: Earthscan, pp 1-29.

Marsh, D. and Rhodes, R., (2002). *Policy communities and issue networks. In: Social networks: critical concepts in sociology.* London: Routledge. pp. 89 -119.

Mason P & T Lang (2017). *Sustainable Diets*. Abingdon: Earthscan.

Matopoulos, A., Vlachopoulou, M., Manthou, V. and Manos, B. (2007). *A conceptual framework for supply chain collaboration: empirical evidence from the agri-food industry*. Supply Chain Management: An international journal. **12**(3), pp. 177–186.

Maxwell, S. and Stone, D.L., (2004). G*lobal Knowledge Networks and International Development*. Oxon: Taylor & Francis.

Mayer, R.E., (1989). C*ognitive views of creativity: Creative teaching for creative learning*. Contemporary Educational Psychology. **14**, pp. 203–211.

McKenzie, S., (2004). *Social sustainability: towards some definitions*. In: Hawke Research Institute Working Paper Series No 27. pp.3-31

McKibben, B., (1996). *Buzzless Buzzword*. New York Times, 10.

McMichael, P., (2009). *A food regime analysis of the 'world food crisis'*. Agriculture and

human values. **26**(4), p. 281.

Moldan, B., Janoušková, S. and Hák, T., (2012). H*ow to understand and measure environmental sustainability: Indicators and targets*. Ecological Indicators,. **17**, pp.4-13.

Moran, P. and Ghoshal, S., (1996). *VALUE CREATION BY FIRMS*. *Academy of Management Best Papers Proceedings.* **8**, pp. 41–45.

Morelli, J., (2011). *Environmental sustainability: A definition for environmental professionals*. Journal of environmental sustainability. **1**(1), p.2.

Morgan, K., Marsden T. and Murdoch, J., (2008). *Worlds of Food: Place, Power, and Provenance in the Food Chain*. OUP Oxford.

Mowery, D.C., Oxley J.E. and Silverman, B.S., (1996). *Strategic Alliances and Interfirm Knowledge Transfer*. *Strategic Management Journal.* **17**, pp. 77–91.

Mulligan, M., (2017). *An introduction to sustainability: Environmental, social and personal perspectives*. London and New York: Routledge.

Munasinghe, M., Jayasinghe, P., Deraniyagala, Y., Matlaba, V.J., dos Santos, J.F., Maneschy, M.C. and Mota, J.A., (2019). *Value–Supply Chain Analysis (VSCA) of crude palm oil production in Brazil, focusing on economic, environmental and social sustainability*. Sustainable Production and Consumption. **17**, pp.161-175.

Nahapiet, J. and Ghoshal, S., (1998). *Social capital, intellectual capital, and the organizational advantage*. Academy of Management Review. **23**, pp. 242–266.

Nestle, M., (2002). *Food Politics: how the food industry influences nutrition and health*. Berkley CA: University of California Press.

Nestle, M., (2013). *Food politics: How the food industry influences nutrition and health*. **3**. Univ of California Press.

Nonaka, I., (1994). *A Dynamic Theory of Organizational Knowledge Creation*. Organization Science. **5**, pp. 14–37.

Nonaka, I., (2006). *Organizational Knowledge Creation Theory: Evolutionary Paths and Future Advances*. Organization Studies. **27**, pp. 1179–1208.

Nonaka, I. and Takeuchi, H., (1995). *Knowledge-Creating Company*. New York: Oxford University Press.

O'Toole, L.J.J., (1997). *Treating Networks Seriously: Practical and Research-Based Agendas in Public Administration*. Public Administration Review. **57**, pp. 45–52.

OECD, Organization for Economic Cooperation and Development, and OECD iLibrary.,

(2013). *Global Value Chains*. Paris and Washington: Brookings Institution Press.

Omann, I. and Spangenberg, J.H., (2002). A*ssessing social sustainability: The social dimension of sustainability in a socio-economic scenario*. Paper presented to the 7th biennial conference of the International Society for Ecological Economics in Sousse, Tunisia, 6-9 March 2002.

Oosterveer, P. & Sonnenfeld, D.A., (2012). *Food, globalisation and sustainability*. London: Earthscan.

Opara, L.U., (2003). T*raceability in agriculture and food supply chain: a review of basic concepts, technological implications, and future prospects*. Journal of Food Agriculture and Environment. **1**, pp. 101–106.

Oreskes, N. and Conway, E.M., (2010). M*erchants of doubt: how a handful of scientists obscured the truth on issues from tobacco smoke to global warming*. London: Bloomsbury Publishing USA.

Ostrom, E.E., Dietz, T., Nives, D., Stern, P.C., Stochich, S. and Weber, E.U., (2002). *The drama of the commons*. Washington DC: National Academy Press.

Pahl-Wostl, C., Mostert, E. and Tabara, D., (2008). T*he growing importance of social learning in water resources management and sustainability science*. Ecology and Society. **13**(1).

Parliamentary Office of Science and Technology, (2012). *Seeking sustainability*. London: Parliamentary Office of Science and Technology.

Parsons, W., (2002). *From Muddling Through to Muddling Up: Evidence Based Policy-Making and the Modernisation of British Government*. Public Policy and Administration. **17**, pp. 43–60.

Pasquero, J., (1991). *Supraorganizational Collaboration: The Canadian Environmental Experiment*. The Journal of Applied Behavioral Science. **27**, pp. 38–64.

Patton, M.Q., (2002). *Qualitative interviewing*. Qualitative research and evaluation methods. **3**, pp. 344–347.

Pellicelli Anna, C., (2003). *Strategic Alliances*. Economia Aziendale. **2**, pp.1-21.

Persson, M., (2013). *A theoretical inquiry of the use of knowledge in the policy process. In: Lindberg, H. ed. Knowledge and Policy Change*. Newcastle upon Tyne: Cambridge Scholars Publisher, pp. 22–41.

Peters, B.G., (2002). *Politics of Bureaucracy.* London and New York: Taylor & Francis.

Porter, M.E., (1980). *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press.

Porter, M.E. and Kramer, M.R., (2002). *The competitive advantage of corporate philanthropy*. Harvard business review. **80**(12), pp. 56–68.

Posch, A. and Steiner, G., (2006). *Integrating research and teaching on innovation for sustainable development*. International Journal of Sustainability in Higher Education. **7**, pp. 276–292.

Pretty, J., (2008). *Agricultural sustainability: concepts, principles and evidence", Philosophical Transactions B*. Biological Sciences. **363**(1491), pp. 447-465.

Pritchard, W. and Burch, D., (2003). *Agri-food Globalisation in Perspective: Restructuring in the Global Tomato Processing Industry*. Aldershot: Ashgate.

Product Sustainability Forum, (2012). *The following organisations have supported the Product Sustainability Forum since its inception in 2011* [online]. PSF. [Viewed 14 March 2016]. Available from: http://www.wrap.org.uk/content/product-sustainability-forum-psf.

Product Sustainability Forum, (2013). *Hotspots, opportunities & initiatives Beef (Fresh & Frozen)* [online]. PSF. Available from: http://www.wrapni.org.uk/sites/files/wrap/Carl%20Nichols,%20WRAP.pdf.

Product Sustainability Forum, (2014a). *Grocery Sector Map* [online]. PSF. Available from: http://www.wrap.org.uk/sites/files/wrap/An%20initial%20assessment%20of%20the%20environmental%20impact%20of%20grocery%20products%20final_0.pdf.

Product Sustainability Forum, (2014b). *Running a whole-chain resource efficiency project* [online]. PSF. [Viewed 15 March 2016]. Available from: http://www.wrap.org.uk/content/whole-chain-resource-efficiency.

Quick, K.S., Narvaez, G.E. and Saunoi-Sandgren, E., (2015). *Changing Minds through Public Deliberation*: Participants' Accounts of their Learning.

Quiédeville, S., Bassene, J.B., Lançon, F., Chabrol, D. and Moustier, P., (2018). *Systemic sustainability of the french organic rice and PGI Einkorn value chains: A preliminary assessment based on network analysis*. Sustainability. **10**(7), p.2344.

Quinn, J.B., Finkelstein, S. and Anderson, P., (1996). *Managing professional intellect: making the most of the best*. Harvard business review. **74**, pp. 71–80.

Radaelli, C.M. (1995). *The role of knowledge in the policy process*. Journal of European Public Policy. **2**, pp. 159–183.

Radaelli, C.M., (1999). *The public policy of the European Union: whither politics of expertise?*. Journal of European public policy. **6**(5), pp. 757–774.

Raffel, T., (2006). *Unternehmensberater in der Politikberatung: eine empirische Untersuchung zu Aktivitäten, Gründen und Folgen*. Potsdam: Springer-Verlag.

Rayner, Lang, T., (2012). *Ecological Public Health*. Abingdon: Earthscan.

Rayner, S., (2012). *Uncomfortable knowledge: the social construction of ignorance in science and environmental policy*. Economy and Society **41**(1), pp. 107–125.

Redclift, M., (2000). *Introduction in Sustainability: Life chances and livelihoods*, (ed) M. Redclift, Routledge, London pp 1-13.

Rhodes, R.A.W., (1996). *The new governance: governing without government*. Political studies. **44**(4), pp. 652–667.

Rhodes, R.A.W., (2007). *Understanding governance: Ten years on*. *Organization studies*. **28**(8), pp. 1243–1264.

Rich, A., (2005). *Think Tanks, Public Policy, and the Politics of Expertise*. Cambridge: Cambridge University Press.

Richardson, J.J., (2006). *European Union: Power and Policy-making*. Oxford: Routledge.

Ritchie, J., Lewis, J., Nicholls, C.M.N. and Ormston, R., (2013). *Qualitative research practice: A guide for social science students and researchers*. London: Sage Publications Ltd.

Rogall, H., (2008). *Ökologische Ökonomie*. Wiesbaden: VS Verlag für Sozialwissenschaften.

Roy, P., Nei, D., Orikasa, T., Xu, Q., Okadome, H., Nakamura, N. and Shiina, T., (2009). *A review of life cycle assessment (LCA) on some food products*. Journal of food engineering. **90**(1), pp. 1–10.

Sage, C., (2012). *Environment and food*. London: Routledge.

Sabatier, P.A., (1988). *An advocacy coalition framework of policy change and the role of policy-oriented learning therein*. Policy Sciences. **21**, pp. 129–168.

Sandhu, S., Ozanne, L.K., Smallman, C. and Cullen, R., (2010). *Consumer driven corporate environmentalism: fact or fiction?.* Business Strategy and the environment. **19**(6), pp. 356–366.

Saunders, C. and Barber, A., (2008). *Carbon footprints, life cycle analysis, food miles: global trade trends and market issues*. Political Science. **60**(1), pp.73-88.

Schmidheiny, S., (1992). *Changing Course: Global Business Perspective on Development and the Environment*. Cambridge (US): MIT Press.

Schmitz, H., (2005). *Value chain analysis for policy-makers and practitioners*. International Labour Organization. Geneva: International Labour Office.

Schumpeter, J.A., (1934). *The Theory of Economic Development*. New Jersey.

Scoones, I., 2007. *Sustainability*. Development in Practice, 17(4-5), pp.589-596.

Scott, W.R., (2008). *Institutions and organizations: Ideas and interests*. London: SAGE Publications.

Seale, C., (1999). *Quality in qualitative research*. Qualitative inquiry. **5**(4), pp. 465–478.

Seidman, I., (2013). *Interviewing as Qualitative Research: A Guide for Researchers in Education and the Social Sciences*. Teachers College Press. p.178

Senauer, B., Asp, E. and Kinsey, J. (1991). *Food trends and the changing consumer.* Minnesota*:* Eagan Press.

Senge, P.M., (1991). T*he fifth discipline, the art and practice of the learning organization*. *Performance + Instruction.* **30**, p. 37.

Sharma, L.L., Teret, S.P. and Brownell, K.D., (2010). *The Food Industry and Self-Regulation: Standards to Promote Success and to Avoid Public Health Failures*. American Journal of Public Health. **100**(2), pp. 240–246.

Silverman, D., (2004). *Qualitative Research: Theory, Method and Practice*. London: SAGE Publications.

Simon, H.A., (1991). Bounded Rationality and Organizational Learning. Organization Science. **2**, pp. 125–134.

Simonin, B.L., (2004). *An empirical investigation of the process of knowledge transfer in international strategic alliances*. Journal of International Business Studies. **35**, pp. 407–427.

Singelmann, J., Poston, D.L. and Saenz, R., (2012). *Expert and Local Knowledge: Poverty Researchers Meet Community Leaders*. In: *Opportunities and Challenges for Applied Demography in the 21st Century*. Springer, pp. 385–398.

Sørensen, E. and Torfing, J., (2009). *Making governance networks effective and democratic through metagovernance*. *Public Administration.* **87**, pp. 234–258.

Spaargaren, G. and Oosterveer, P., (2013). *Food Practices in Transition: Changing Food Consumption, Retail and Production in the Age of Reflexive Modernity*. New York and London: Taylor & Francis.

Spek, R.V.D. and Spijkervet, A., (1997). *Knowledge management: Dealing intelligently with knowledge*. Boston: New York.

Sporleder, T.L. and Moss, L.E., (2002). *Knowledge management in the global food system: network embeddedness and social capital*. American Journal of Agricultural Economics, pp. 1345–1352.

Starik, M. and Rands, G.P., (1995). *Weaving an integrated web: multilevel and multisystem perspectives of ecologically sustainable organizations.* Academy of Management Review. 20, pp. 908–935.

Stenbacka, C., (2001). *Qualitative research requires quality concepts of its own*. Management Decision. **39**(7), pp. 551–556.

Sternberg, R.J. and Lubart, T.I., (1999). *The concept of creativity: Prospects and paradigms*. Cambridge: Cambridge University Press.

Stevens, A., (2007). *Survival of the ideas that fit: an evolutionary analogy for the use of evidence in policy*. *Social policy and society.* **6**(01), pp. 25–35.

Stirling, A., Glover, D. and Millstone, E., (2015). *Regulating Genetic Engineering: The Limits And Politics Of Knowledge*. Issues in Science and Technology. **31**(4), pp. 23-26.

Stone, D., (1999). *Learning lessons and transferring policy across time, space and disciplines*. Politics. **19**(1), pp. 51–59.

Stone, D., (2000). *Non-governmental policy transfer: the strategies of independent policy institutes*. *Governance.* **13**(1), pp. 45–70.

Stone, D., (2008). *Global public policy, transnational policy communities, and their networks*. Policy Studies Journal. **36**, pp. 19–38.

Strauss, A. and Corbin, J., (1990). *Basics of qualitative research*. Newbury Park, CA: Sage publications.

Sutherland, W.J., Bellingan, L., Bellingham, J.R., Blackstock, J.J., Bloomfield, R.M., Bravo, M., Cadman, V.M., Cleevely, D.D., Clements, A., Cohen, A.S. and Cope, D.R., (2012). *A collaboratively-derived science-policy research agenda*. PloS one. **7**(3), p.e31824.

Sutton, P., (2004). *A perspective on environmental sustainability*. paper on the Victorian Commissioner for Environmental Sustainability, pp.1-32.

Taylor, D.H., 2005. *Value chain analysis: an approach to supply chain improvement in agri-food chains*. International Journal of Physical Distribution & Logistics Management, **35**(10), pp.744-761.

Taylor, D., (2006). Critical policy evaluation and the question of values: a psychosocial approach. *Critical Social Policy.* **26,** pp. 243–267.

The Department of Economic and Social Affairs of the United Nations Secretariat, (2015). *World Population Prospects The 2015 Revision*. New York: ESA publicayions.

The European Food SCP Roundtable, (2010a). *Road map for the development and dissemination of the harmonised framework methodology for the environmental assessment of food and drink products* [online]. Food SCP Roundtable. [Viewed 16 March 2016]. Available from: http://www.food-scp.eu/files/Road_Map_WG1.pdf.

The European Food SCP Roundtable, (2010b). *Voluntary environmental assessment and communication of environmental information along the food chain, including to consumers; Guiding Principles* [online]. Food SCP Roundtable. [Viwed 16 March 2016]. Available from: http://www.food scp.eu/files/ENVIFOOD_Protocol_Vers_1.0.pdf.

The European Food SCP Roundtable, (2010c). *Working Group 4; Non-Environmental Aspects of Sustainability* [online]. Food SCP Roundtable. [Viwed 16 March 2016]. Available from: http://www.food-scp.eu/node/28.

The European Food SCP Roundtable, (2012). *Continuous environmental improvement - Working Group 3* [online]. SCP Roundtable. [Viewed 16 March 2019]. Available from: http://www.food-scp.eu/node/27.

The European Food SCP Roundtable, (2013). *ENVIFOOD Protocol* [online]. SCP Roundtable. [Viewed 16 March 2016]. Available from: http://food-scp.eu/node/75.

The European Food SCP Roundtable, (2015a). *The European Food SCP Roundtable* [online]. SCP Roundtable. [Viewed 16 MArch 2016]. Available from: http://www.food-scp.eu/files/Food_SCP_RT.ppt.

The European Food SCP Roundtable, (2015b). *The European Food SCP Roundtable* [online]. SCP Roundtable. [Viewed 16 March 2016]. Available from: http://www.food-scp.eu/files/images/brief.jpg.

The European Food SCP Roundtable, (2015c). *Web Page Food Sustainable Consumption and Production Roundtable* [online]. SCP Roundtable. [Viewed 16 March 2016]. Available from: http://www.food-scp.eu.

The European Food SCP Roundtable, (2016). *The European Food SCP Roundtable* [online]. SCP Roundtable. [Viewed 16 March 2016]. Available from: http://www.food-scp.eu/Food_SCP_RT.ppt.

Thompson, E.P., (1968). *The Making of the English Working Class*. Harmondsworth: Penguin.

Thompson, J., Millstone, E., Scoones, I., Ely, A., Marshall, F., Shah, E. and Stagl, S., (2007). *Agri-food System Dynamics: pathways to sustainability in an era of uncertainty*. STEPS Working Paper 4, Brighton: STEPS Centre.

Thomson, A.M. and Perry, J.L., (2006). *Collaboration processes: Inside the black box*. Public Administration Review. **66**, pp. 20–32.

Trist, E.,91977). *Collaboration in Work Settings: A Personal Perspective*. The Journal of Applied Behavioral Science. **13**, pp. 268–278.

Trodd, L. ed., (2016). *The Early Years Handbook for Students and Practitioners: An Essential Guide for the Foundation Degree and Levels 4 and 5*. London and New York: Routledge.

Tsang, E.W.K., (1999). *A Preliminary Typology of Learning in International Strategic Alliances*. Journal of World Business. **34**, pp. 211–229.

Turner, D.W., (2010). *Qualitative Interview Design: A Practical Guide for Novice Investigators*. The Qualitative Report. **15**(3), pp. 754–760.

United Nations, (1987). *Report of the world commission on environment and development*. General Assembly Resolution 42/187.

Vachon, S. and Klassen, R.D., (2008). E*nvironmental management and manufacturing performance: The role of collaboration in the supply chain*. International journal of production economics. **111**(2), pp.299-315.

Vallance, S., Perkins, H.C. and Dixon, J.E., (2011). *What is social sustainability? A clarification of concepts*. Geoforum. **42**(3), pp.342-348.

Vermeir, I. and Verbeke, W., (2006). S*ustainable food consumption: Exploring the consumer "attitude–behavioral intention" gap*. Journal of Agricultural and Environmental ethics. **19**(2), pp. 169–194.

Victor, P.A., (2008). *Managing without growth: slower by design, not disaste*r. Massachusetts: Edward Elgar Publishing.

Waas, T., Hugé, J., Verbruggen, A. and Wright, T., (2011). *Sustainable development: A bird's eye view*. Sustainability. **3**(10), pp.1637-1661.

Wallington, T., Lawrence, G. and Loechel, B., (2008). *Reflections on the Legitimacy of Regional Environmental Governance: Lessons from Australia's Experiment in Natural Resource Management*. Journal of Environmental Policy & Planning. **10**, pp. 1–30.

Weber, E.P., (1998). *Successful Collaboration: Negotiating Effective Regulations.*

Environment. Science and Policy for Sustainable Development. **40**(9), pp. 10–15.

Weber, R.P., (1990). *Basic Content Analysis*. London: SAGE Publications.

Weingart, P., (1999). *Scientific expertise and political accountability: paradoxes of science in politics*. Science and Public Policy. **26**, pp. 151–161.

Weiss, C., (1979). *The many meanings of research utilization*. Public Administration Review. **39**, pp. 426–431.

Weiss, C.H., (1977). *Research for Policy's Sake: The Enlightenment Function of Social Science Research*. Policy Analysis. **3**, pp. 531–545.

Willard, B., (2012). *The new sustainability advantage: seven business case benefits of a triple bottom line*. Gabriola Island: New Society Publishers.

Williams, P., (2012). *Collaboration in Public Policy and Practice: Perspectives on Boundary Spanners*. Bristol: Policy Press.

Winterton, J., Delamare, F. and Stringfellow, E., (2006). *Typology of knowledge, skills and competences: clarification of the concept and prototype*. Luxembourg: Office for Official Publications of the European Communities Luxembourg.

Wognum, P.M.N., Bremmers, H., Trienekens, J.H., Van der Vorst, J.G.A.J. and Bloemhof, J.M., (2011). *Systems for sustainability and transparency of food supply chains–Current status and challenges*. Advanced Engineering Informatics. **25**(1), pp. 65–76.

Wood, D.J., (1991). *Toward a Comprehensive Theory of Collaboration*. The Journal of Applied Behavioral Science. **27**(2), pp. 139–162.

Wrap., (2014a). *Potato Value Chain (Co-operative Food and Farms)* [online]. Wrap. [Viewed 09 April 2016]. Available from: http://www.wrap.org.uk/sites/files/wrap/Increasing%20Profitability%20in%20the%20Potato%20Supply%20Chain.pdf.

Wrap., (2014b). *Running a whole-chain resource efficiency project* [online]. Wrap. [Viewed 09 April 2016]. Available from: http://www.wrap.org.uk/sites/files/wrap/WCRE%20Business%20Case%20Final%20March%202015.pdf.

Wrap., (2017). *International product sustainability network* [online]. Wrap. [Viewed 09 April 2016]. Available from: http://www.wrap.org.uk/content/product-sustainability-forum-psf.

Wrap., (2014a). *Increasing Profitability in the Potato Supply Chain: Key Opportunities for UK Potatoes* [online]. Wrap. [Viewed 09 April 2016]. Available from: http://www.wrap.org.uk/sites/files/wrap/Increasing%20Profitability%20in%20the

%20Potato%20Supply%20Chain.pdf.

Wrap., (2014b). *Pathfinder projects / Current Pathfinder Projects* [online]. Wrap. [Viewed 09 April 2016]. Available from: http://www.wrap.org.uk/cy/node/16190.

Wrap., (2016a). *Product Sustainability Forum Knowledge Base* [online]. Wrap. [. Available at: http://www.wrap.org.uk/content/psf-knowledge-base-0.

Wrap., (2016b). *PSF Path Finder Project Heat Map* [online]. Wrap. [Viewed 09 April 2016]. Available from: https://footprinter.com/kb/psf/heatmap/.

WRAP., (2016c). *The Courtauld Commitment* [online]. Wrap. [Viewed 09 April 2016]. Available from: http://www.wrap.org.uk/content/what-is-courtauld.

WRAP., (2017). *Product Sustainability Forum* [online]. Wrap. [Viewed 09 April 2016]. Available from: http://www.wrap.org.uk/content/product-sustainability-forum-psf.

Wynne, B., (1992). *Uncertainty and environmental learning: reconceiving science and policy in the preventive paradigm*. Global environmental change. **2**(2), pp. 111–127.

Yin, R.K., (2013). *Case study research: Design and methods*. London and New York: Sage publications.

Zito, A.R., (2001). E*pistemic communities, collective entrepreneurship and European integration*. Journal of European Public Policy. **8**(4), pp. 585–603.

Appendices

Appendix A: Case study protocol

1) Brief Overview of the case study

Product Sustainability Forum (PSF):

- Established 2011 in London
- Predominantly food industry actors are members
- WRAP is facilitator of the PSF
- The Product Sustainability Forum is also supported by Defra, the Scottish Government and the Welsh Government
- Regular (often monthly) meetings

The European Food Sustainable Consumption and Production Roundtable

- Established in Brussels on 20 January 2014
- European Commission is Co-Chair
- Predominantly food industry stakeholders are members
- Regular (often monthly) meetings

2) Field procedures

Document analysis:

- Document analysis to be done before the interviews
- For The Product Sustainability Forum and The European Food Sustainable Consumption and Production Roundtable, analyse primary documents, such as media articles, press releases and online content on the webpage.
- Info to obtain: Types of knowledge promoted in the context of food sustainability and collaborative activities that have led to the creation, transfer and utilisation of collaborative knowledge.

Approach:

- Analyse primary documents that have been published since the existence of both collaborative platforms.

Interviews:

- Invite participants by email (with info sheet and consent form) follow up by phone if necessary*
- Arrange interview at participant's workplace if possible (tell family of time/location)
- Before turning on tape: Confirm interviewee has read background information and invite questions.
- Read through consent form, noting opportunity to withdraw. Sign two copies, retain one. Ask
- interviewee to suggest short form of job description to use as identifier (e.g. 'local government
- For telephone interviews, request return of consent form by email
- Pay attention to validation of subjective info, asking open questions
- Transcribe interview

- Send copy of transcript or quotes to be used if requested

3) Case study questions/information to obtain from each method

Info to obtain: Narratives, opinions, experiences and observations of actors

Draft Email to potential interviewees*

Dear _____

My name is Ceyhun Gungor and I am a PhD student in Food Policy at the Centre for Food Policy (City University London) supervised by Prof. Tim Lang and Prof. David Barling. My PhD topic focuses on collaborative groups and their role as knowledge providers for food policy (please find my abstract attached to this email for more information).

The European Food Sustainable Consumption and Production Roundtable is an indispensable collaboration for my research and I am convinced that the SCP will highly benefit from my research outcome. I am deeply interested in the SCP regarding your long experience of brining multiple actors across the food and drink value chain together. The SCP displays the success of creating knowledge and discovering innovative concepts for a sustainable development through a collaborative approach.

I would be delighted if you could give me about 15 minutes of your time for an interview, in order to help me with my research project.

Yours faithfully

Ceyhun Gungor

Guide to questions (interviews are semi-structured so room for variation)

For members of the SCP Roundtable and the PSF

1. Effectiveness can be measured through shaping the way key actors/stakeholders think about food and sustainability. How has the PSF/SCP performed in this respect?

   → Is this still the case?

2. How does the PSF/SCP work internally regarding knowledge creation?
   - By this I mean processes such as meetings or email exchanges or where new ideas emerge and are combined with already existing knowledge.

3. What type of knowledge does your organisation see as relevant regarding food sustainability challenges of the 21st century and why?
   - By type I mean 'scientific knowledge', social knowledge or everyday knowledge.

   1.1 (Follow up question if the "why" aspect doesn't cover the aspect of influence): How influential had this knowledge been regarding food and sustainability topics and is this still the case?

4. What are the best and most efficient ways of communicating and exchanging knowledge between your organisation and other actors/stakeholders that play a role in food and sustainability?

5. Imagine you are working at the FAO and you have to put a collaborative platform together to find the answers to current food sustainability challenges. Whom would you want to be on that platform and why?

For policy experts and other relevant experts that are EXTERNAL to the PSF and SCP Roundtable

1. How effective has the PSF been in changing how policy and decision makers think regarding food and sustainability? Is this still the case?
   - *(Depending on whom I'm talking with, I will mention PSF or SCP)*

2. How important do you think collaborative approaches are for finding solutions to food sustainability challenges?
   - *By collaborative approaches I mean multi-sectoral and multi-disciplinary groups from government, industry and civil society.*

3. What are the best and most efficient ways of communicating and exchanging knowledge between actors that play a role in the area of food and sustainability?

4. What type of knowledge do you think is relevant regarding food and sustainability and why?
   - By type I mean 'scientific knowledge', social knowledge or everyday knowledge.

5. Imagine you are working at the FAO and you have to put a collaborative platform together to find the answers to current food sustainability challenges. Whom would you want to be on that platform and why?

Appendix B: Documents analysed by case study

Product Sustainability Forum

Product Sustainability Forum 2012 *The following organisations have supported the Product Sustainability Forum since its inception in 2011*
Product Sustainability Forum 2013 *Hotspots, opportunities & initiatives Beef (Fresh & Frozen)*
Product Sustainability Forum 2014 *Grocery Sector Map*
Product Sustainability Forum 2014 *Running a whole-chain resource efficiency project*
Wrap 2014 *Potato Value Chain (Co-operative Food and Farms)*
Wrap 2014 *Running a whole-chain resource efficiency project*
Wrap 2017 International product sustainability network
WRAP 2014 *Increasing Profitability in the Potato Supply Chain: Key Opportunities for UK Potatoes*.
WRAP 2016 Product Sustainability Forum Knowledge Base
WRAP 2016 PSF Path Finder Project Heat Map
WRAP 2016 The Courtauld Commitment

SCP Roundtable

The European Food SCP Roundtable 2010 *ROAD MAP FOR THE DEVELOPMENT AND DISSEMINATION OF THE HARMONISED FRAMEWORK METHODOLOGY FOR THE ENVIRONMENTAL ASSESSMENT OF FOOD AND DRINK PRODUCTS*
The European Food SCP Roundtable 2010 *Voluntary environmental assessment and communication of environmental information along the food chain, including to consumers; Guiding Principles*
The European Food SCP Roundtable 2010 *Working Group 4; Non-Environmental Aspects of Sustainability*
The European Food SCP Roundtable 2012 Continuous environmental improvement - Working Group 3
The SCP Roundtable 2013 *ENVIFOOD Protocol*

Note: The document analysis involved further content that was only available on the web content of the SCP Roundtable and PSF. Therefore, please also see refferences to:

SCP Roundtable website: www.food-scp.eu
PSF website: www.wrap.org.uk/content/product-sustainability-forum

Appendix C: Ethical Approval

CITY UNIVERSITY LONDON

Senate Research Ethics Committee
Application for Approval of Research Involving Human Participants

Please tick the box for which Committee you are submitting your application to

☐	Senate Research Ethics Committee
☐	Cass Business School
☐	Computer Science
☒	School of Arts & School of Social Sciences Research Ethics Committee
☐	School of Health Sciences Research Ethics Committee
☐	Department for Learning Enhancement and Development

For **Senate** applications: return one original and eight additional hardcopies of the completed form and any accompanying documents to [redacted], Secretary to Senate Research Ethics Committee, University Research Office, Northampton Square, London, EC1V 0HB. Please also email an electronic copy to [redacted] (indicating the names of those signing the hard copy).

For **Computer Science** applications: a single copy of the application form and all supporting documents should be emailed to [redacted]

For **School of Arts & School of Social Sciences** Research Ethics Committee submit a single copy of the application form and all supporting documentation to your Department's Research and Ethics Committee by email.

For **School of Health Sciences** applications: submit all forms (including the Research Registration form) electronically (in Word format in a single document) to [redacted]

For Department for Learning Enhancement and Development a single copy of the application form and all the supporting documentations should be emailed to [redacted]

Refer to the separate guidelines while completing this form.

PLEASE NOTE

- Please determine whether an application is required by going through the checklist before filling out this form.
- Ethical approval **MUST** be obtained before any research involving human participants is undertaken. Failure to do so may result in disciplinary procedures being instigated, and you will not be covered by the University's indemnity if you do not have approval in place.
- You should have completed <u>every</u> section of the form
- The Signature Sections <u>must</u> be completed by the Principal Investigator (the supervisor and the student if it is a student project)

Project Title:
Learning and Knowledge Transfer Processes of Non-Competitive Collaborative Groups and their Role in Shaping Food Sustainability Policy The Investigation of Mechanisms, Structures and Power Based on the Case Studies European Food Sustainable Consumption and Production Roundtable and the Products Sustainability Forum
Short Project Title (no more than 80 characters):
Learning and Knowledge Transfer Processes of Non-competitive Collaborative Groups and their Role in Shaping Food Sustainability Policy
Name of Principal Investigator(s) (*all* students are require to apply jointly with their supervisor and all correspondence will be with the supervisor):
[redacted]
Post Held (including staff/student number):
[redacted]
Department(s)/School(s) involved at City University London:
Centre for Food Policy, Dept Sociology, School of Arts and Social Sciences
If this is part of a degree please specify type of degree and year
PhD/MPhil, 3 years
Date of Submission of Application:
27 July 2015

1. Information for Non-Experts

Lay Title (no more than 80 characters)

Learning and Knowledge Processes of Collaborative Groups in Food Policy

Lay Summary / Plain Language Statement (no more than 400 words)

Today's policy and decision makers need to justify their policies through knowledge that is scientifically proven and/or socially accepted. Important sources for such knowledge are private collaborative groups that are specialised in a certain policy area which can consist of independent stakeholders from civil society, industry and government. Food-related collaborative groups have become critical within governance and policy structures over the last decades. Due to the high complexity of the food value chain. The nature and means of knowledge exchange between collaborative groups and state are key areas of innovation in sustainability policy today.

The aim of this research project is to understand the mechanisms and the role of state, civil society and industry led collaborative groups with regard to the role of knowledge exchange and learning processes. The study concerns itself with the ability of the Product Sustainability Forum (PSF) and the Sustainable Consumption and Production Roundtable (SCP) in shaping food policy through knowledge impact. The project investigates what kind of knowledge is mainly created within these groups and transferred to state officials. The aim of my research project is to understand why certain types of knowledge, such as scientific or local knowledge, are seen as relevant for food policy. The research particularly aims to understand how knowledge (of the collaborative groups) influences policy and decision making within food sustainability policy.

2. Applicant Details

This project involves:
(*tick as many as apply*)

☐	Staff Research	☒	Doctoral Student
☐	Undergraduate	☐	M-level Project
☐	Externally funded	☐	External investigators
☐	Collaboration	☐	Other
Provide details of collaboration and/or other			

Address for correspondence (including email address and telephone number)
(Principal Investigator)

[redacted]

Other staff members involved

Title, Name & Staff Number	*Post*	*Dept & School*	*Phone*	*Email*
[redacted]	Professor at Centre for Food Policy	Centre for Food Policy, Dept Sociology, SASS	[redacted]	[redacted]
[redacted]	Professor of Food Policy & Food Security	CEFAM, Univ Hertfordshire (since July 2015)	[redacted]	[redacted]
[redacted]	Professor of Food and	Centre for Food Policy, Dept Sociology, SASS	[redacted]	[redacted]

All students involved in carrying out the investigation

Name & Student Number	*Course / Year*	*Dept & School*	*Email*
[redacted]	PhD Year 1	Department of Sociology, School of Arts and Social Sciences	[redacted]

External co-investigators

Title & Name	*Post*	*Institution*	*Phone*	*Email*

Please describe the role(s) of all the investigators including all student(s)/external co-investigator(s) in the project, especially with regards to interaction with study participants.

I will conduct expert interviews with active participants in knowledge groups in the food sector. This will be done in consultation with the supervisors in the normal doctoral process.

If external investigators are involved, please provide details of their indemnity cover.

Application Details

2.1 Is this application being submitted to another ethics committee, or has it been previously submitted to an ethics committee? *This includes an NHS local Research Ethics Committee or a City University London School Research Ethics Committee or any other institutional committee or collaborating partners or research site.* (See the guidelines for more information on research involving NHS staff/patients/ premises.) **YES** ☐ **NO** ☒

If yes, please provide details for the Secretary for the relevant authority/committee, as well as copies of any correspondence setting out conditions of approval.

n/a

2.2 If any part of the investigation will be carried out under the auspices of an outside organisation, e.g. a teaching hospital, please give details and address of organisation.

n/a

2.3 Other approvals required – has permission to conduct research in, at or through another institution or organisation been obtained? **YES** ☐ **NO** ☒

If yes, please provide details and include correspondence

n/a

2.4 Is any part of this research project being considered by another research ethics committee? **YES** ☐ **NO** ☒

If yes, please give details and justification for going to separate committees, and attach correspondence and outcome

n/a

2.5 Duration of Project

Start date:September 2015 Estimated end date:September 2016

Funding Details

2.6 Please provide details of the source of financial support (if any) for the proposed investigation.

I'm holding a scholarship awarded by the Scholarship Committee of the Studienstiftung des Deutschen Volkes (awarded in 2015)

2.6a Total amount of funding being sought: £30000

2.6b Has funding been approved? **YES** ☒ **NO** ☐

If no, please provide details of when the outcome can be expected

2.6c Does the funding body have any requirements regarding retention, access and storage of the data? **YES** ☐ **NO** ☐

If yes, please provide details

International Research

2.7 Is any part of the research taking place outside of England/Wales? (if not go to section 3) **YES** ☒ **NO** ☐

If yes, please provide details of where

Brussels, particularly with the aim to investigate EU bodies and communities of practice, in line with the research objectives.

2.7a Have you identified and complied with all local requirements concerning ethical approval & research governance*? **YES ☒ NO ☐**

2.7b Please provide details of the local requirements, including contact information.

I will collect date in the United Kingdom and in Belgium. Both countries are located within the European Union and I am eligible to travel and stay in both countries legally and I do not need any visa. I am a German citizen and there are no local or legal requirements for me to stay, work and travel within the UK and Belgium.

Data collection within the UK:

I am going to interview individuals that are working within the Product Sustainability Forum (PSF). The PSF is located at:

The Waste & Resources Action Programme (WRAP), 21 Horse Fair, Banbury OX16 0AH, Banbury OX16 0AH, UK.

There are no specific requirements for contacting potential interviewees at the PSF and arranging a date and place for conducting the interview. The secretary of WRAP is free accessible to the public where I will identify myself as a PhD student. I will follow and accept any security and safety instructions that are specific for WRAP and its facilities. I will gain access to the WRAP facilities through the person that I am going to interview. Alternatively I will conduct the interview in a café or restaurant, which are freely accessible to the public.

Data collection within Belgium:

I am going to interview individuals that are working with the European Food Sustainable Consumption and Production Roundtable (SCP). The SCP is located at:

c/o Landmark Europe, Rue du Collège 27, 1050 Brussels, Belgium

The SCP is chaired by the EU-Commission and is located within a building that is freely accessible by the public. There are no specific local requirements for contacting potential interviewees at the SCP and arranging a date and place for conducting the interview. The reception of the SCP is freely accessible to the public where I will identify myself as a PhD student. I will follow and accept any security and safety instructions that are specific for SCP and its facilities. I will gain access to the facilities of the SCP through the person that I will interview. Alternatively I will conduct the interview in a café or restaurant, which are freely accessible to the public.

2.7c Please give contact details of a local person identified to field initial complaints local so the participants can complain without having to write to or telephone the UK

To City University London, using the normal procedures and information given to interviewees.

*Please note many countries require local ethical approval or registration of research projects, further some require specific research visas. If you do not abide by the local rules of the host country you will invalidate your ethical approval from City University London, and may run the risk of legal action within the host country.

3. Project Details

3.1 Provide the background, aim and explanation for the proposed research.

Many scholars agree that knowledge transfer and learning processes within collaborative structures are complex and at the same time an upcoming research area (Gray 1989; Hamel 1991a; Huxham 1996; Innes and Booher 2010; Lozano 2014). Over the same time period stakeholders from civil society industry and governments are increasingly forming collaborative initiatives to solve challenges, such as global warming, hunger or natural resource depletion that will arise in the 21st century. Such collaborative groups are seen as political platforms where stakeholders can express their ideas, learn from others, engage in and give advice to policy makers. Literature on collaboration points out the importance of collective initiatives for the creation of knowledge (Lozano 2007; Scott 2008; Innes and Booher 2010).

There are a number of non-competitive collaborations which have the aim to understand the complexity of the food system and to find solutions for the rising problems that emerge through impacts such as climate change, the industrialisation of food production or financial crises. In this sense, knowledge that is being created and transferred within and through such groups play a key role in shaping policies within governance arrangements. Some work has been done on the knowledge impact of non-state actors on policy formatting processes. Research which blends in the role of knowledge within food policy has been carried out by Sporleder and Moss focusing on knowledge management in the global food system and the role of social capital. Also Maria Fonte (2008) investigated the dynamics of knowledge, in particularly local and lay knowledge in the valorisation of local food networks based on the outcomes of the CORASON project. Her conclusion was that more reflexivity on the role of expert and science is needed in order to use and understand lay knowledge in an efficient and appropriate way.
According to leading scholars on knowledge management and collaborative policy making, such as Judith Innes (2010) and Barbara Gray (1985, 2000), it is argued that more empirical research needs to be undertaken. However, research which blends the combination of collaborative initiatives and the collaborative advantage of knowledge creation and sharing in food policy is lacking.
This study is therefore going to analyse the two collaborative groups European Food Sustainable Consumption and Production Roundtable and the Products Sustainability Forum with regard to their role as knowledge creators and providers for policies regarding food sustainability.

Key research questions:

- How do the food networks SCP and PSF understand themselves as knowledge creators?
- How do mechanisms and processes of knowledge creation and transfer function within the SCP and PSF?
- What type of knowledge is mainly created and transferred and why are certain types of knowledge more relevant in shaping food policy than others?
- To what extent are the collaborative groups PSF and SCP seen as expert groups within state-centric government arrangements?
- What are the differences of knowledge creation and transfer between the collaborative group PSF and SCP?

Key research aims:

To understand how knowledge is created and transferred within the European SCR and PSF.
To explore the role of these collaborative groups in providing influential (knowledge played a vital role for the implementation of policies) knowledge to public officials.
Once the research is completed and the mechanisms are investigated, the results will help similar multidisciplinary groups to work more effectively, enabling them to use their role as knowledge providers in a more conscious and structured way.

3.2 Provide a summary and brief explanation of the design, methodology and plan for analysis that you propose to use.

I will collect primary data through qualitative expert interviews and qualitative content analysis. In my research project I will use Semi-structured and open-ended expert interviews that will follow a narrative rational. Thus, the use of questionnaire should be regarded as an aide-mémoire rather than an unalterable interview guide. In the literature, this methodology is commonly referred to as "Standardised Open-Ended Interviews". The interviews target on the opinions and perspectives of key persons within the collaborative groups SCP and PSF. The main target groups are the following: (1) individuals within collaborative food groups who are responsible for internal and external communication or publication; (2) individuals who function as commentators in collaborative actions;

and (3) individuals who are responsible for the accumulation of the outcomes (from collaborative interactions) and the formulation of tangible statements.
In order to gain an in depth understanding of the structures and key objectives of the SCP and PSF it is necessary to study their published material. The methodology I will use here can be described as a content analysis. The approach includes, firstly, the analysis of textual primary material produced by the SCP and PSF and, secondly, the reduction of that material to more relevant and manageable bits of data.

3.3 Please explain your plans for dissemination, including whether participants will be provided with any information on the findings or outcomes of the project.

Participants will be sent an electronic copy of the finished PhD when once it has been completed, interviewees will be named, but can also remain anonymous if they want to be.

3.4 What do you consider are the ethical issues associated with conducting this research and how do you propose to address them?

The main ethical issue is the usage of sensible information regarding internal structures and processes. Therefore, the recordings will be protected by a password and stored securly. In addition, the issue of anonymity will be strictly ensured in line with the interviewees' wishes.

3.5 How is the research intended to benefit the participants, third parties and/or local community?

The goal of the research project is to bring further analysis and understanding of the investigated collaborative group's internal knowledge effects and the role as knowledge providers for food policy implementations. It is especially actors within the food industry and governmental bodies who can benefit from my research. The research project aims to provide interesting insights into how such communities of practice operate and helps to shed light on their limitations and motivations.

3.6a Will invasive procedures (for example medical or surgical) be used?

YES ☐ **NO** ☒

3.6b If yes, what precautions will you take to minimise any potential harm?

n/a

3.7a Will intrusive procedures (for example psychological or social) be used?

YES ☐ **NO** ☒

3.7b If yes, what precautions will you take to minimise any potential harm?

n/a

3.8a In the course of the investigation might pain, discomfort (including psychological discomfort), inconvenience or danger be caused? **YES** ☐ **NO** ☒

3.8b If yes, what precautions will you take to minimise any potential harm?

n/a

3.9 Please describe the nature, duration and frequency of the procedures?

n/a

4. Information on participants

4.1a How many participants will be involved?

30

4.1b What is the age group and gender of the participants?

27-65, male and female interviewees

4.1c Explain how you will determine your sample size and the selection criteria you will be using. Specify inclusion and exclusion criteria. If exclusion of participants is made on the basis of age, gender, ethnicity, race, disability, sexuality, religion or any other factor, please explain and justify why.

Selection criteria will exclusively involve actors working within the European SCR, the PSF and policy makers (UK and EU) in the field of food and agriculture. Thus, the individuals will be coming from segments such as civil society, industry and public officials.

4.2 How are the participants to be identified, approached and recruited, and by whom?

Participants will be identified through desk research process, thereby identifying key actors who should be approached for interview. Recruitment will be done through contacts, established relationships with relevant gatekeepers.

4.3 Describe the procedure that will be used when seeking and obtaining consent, including when consent will obtained. Include details of who will obtain the consent, how are you intending to arrange for a copy of the signed consent form for the participants, when will they receive it and how long the participants have between receiving information about the study and giving consent.

After establishing a meeting with the potential interviewee, a consent and explanatory form will be emailed to them, as well as brought along in person for reconsideration proir to the actual itterview.

4.4 How will the participant's physical and mental suitability for participation be assessed? Are there any issues related to the ability of participants to give informed consent themselves or are you relying on gatekeepers on their behalf?

There should be no physical or mental concerns for the participants.

4.5 Are there any special pressures that might make it difficult to refuse to take part in the study? Are any of the potential participants in a dependent relationship with any of the investigators (for instance student, colleague or employee) particularly those involved in recruiting for or conducting the project?

There should not be any special pressures that would force them to participate - no personal relatives will be interviewed. Nevertheless, it is important to keep in mind that other pressures could come up which are not linked to personal family ties, particularly through the working environment of the interviewee. The interviewee might feel under pressure by senior colleagues to provide appropriate answers to my interview questions and, thus, might not feel as free as he or she wants to be. There is a potential bias of representing the institution in a positive light.

4.6 Will the participant's doctor be notified? **YES** ☐ **NO** ☒
(If so, provide a sample letter to the subject's GP.)

4.7 What procedures are in place for the appropriate referral of a study participant who discloses an emotional, psychological, health, education or other issue during the course of the research or is identified by the researcher to have such a need?

There should be no need to refer any study participant for other issues, and interviewees will not be asked any personal questions.

4.8 What steps will be taken to safeguard the participants from over-research? (I.e. to ensure that the participants are not being used in multiple research project.)

Participants have the opportunity refuse to participate if they feel uncomfortable or over-researched.

4.9 Where will the research take place?

UK and Brussels or, in exceptional circumstances elsewhere within the EU (if there is a specific need to interview someone).

4.10 What health and safety issues, if any, are there to consider?

There should be no health and safety issues directly concerned with the research project.

4.11 How have you addressed the health and safety concerns of the participants, researchers and any other people impacted by this study? (This includes research involving going into participants' homes.)

A consent and explanatory form will be given to each participant, and they are all able-minded adults who are capable of giving consent.

4.12 It is a University requirement that an at least an initial assessment of risk is undertaken for all research and if necessary a more detailed risk assessment be carried out. Has a risk assessment been undertaken?* **YES ☐ NO ☒**

4.13 Are you offering any incentives or rewards for participating? **YES ☐ NO ☒**

If yes please give details

n/a

*Note that it is the Committee's prerogative to ask to view risk assessments.

5. Vulnerable groups

5.1 Will persons from any of the following groups be participating in the study? (if not go to section 6)

Adults without capacity to consent	☐
Children under the age of 18	☐
Those with learning disabilities	☐
Prisoners	☐
Vulnerable adults	☐
Young offenders (16-21 years)	☐
Those who would be considered to have a particular dependent relationship with the investigator (e.g. those in care homes, students, employees, colleagues)	☐

5.2 Will you be recruiting or have direct contact with any children under the age of 18?

YES ☐ NO ☒

5.2a If yes, please give details of the child protection procedures you propose to adopt should there be any evidence of or suspicion of harm (physical, emotional or sexual) to a young person. Include a referral protocol identifying what to do and who should be contacted.

5.2b Please give details of how you propose to ensure the well-being of the young person, particularly with respect to ensuring that they do not feel pressured to take part in the research and that they are free to withdraw from the study without any prejudice to themselves at anytime.

5.3 Will you be recruiting or have direct contact with vulnerable adults? YES ☐ NO ☒

5.3a If yes, please give details of the protection procedures you propose to adopt should there be any evidence of or suspicion of harm (physical, emotional or sexual) to a vulnerable adult. Include a referral protocol identifying what to do and who should be contacted.

5.3b Please give details of how you propose to ensure the well-being of the vulnerable adult, particularly with respect to ensuring that they do not feel pressured to take part in the research and that they are free to withdraw from the study without any prejudice to themselves at anytime. You should indicate how you intend to ascertain that person's views and wishes.

5.3c Please give details of any City staff or students who will have contact with vulnerable adults and/or will have contact with young people (under the age of 18) and details of current (within the last 3 years) City University London Disclosure and Barring check.

Name	*Dept & School*	*Student/Staff Number*	*Date of DBS*	*Type of disclosure*

5.3d Please give details of any non-City staff or students who will have contact with vulnerable adults and/or will have contact with young people (under the age of 18) and details of current (within the last 3 years) Disclosure and Barring check.

Name	*Institution*	*Address of organisation that requested the disclosure*	*Date of DBS*	*Type of disclosure*

5.4 Will you be recruiting any participants who fall under the Mental Capacity Act 2005?

YES ☐ **NO** ☒

If so you MUST get approval from an NHS NRES approved committee (see separate guidelines for more information).

6. Data Collection

6.1a Please indicate which of the following you will be using to collect your data

Please tick all that apply

Questionnaire	☐
Interviews	☒
Participant observation	☐
Focus groups	☐
Audio/digital-recording interviewees or events	☒
Video recording	☐
Physiological measurements	☐
Quantitative research (please provide details)	☐
Other	☐
Please give details	

6.1b What steps, if any, will be taken to safeguard the confidentiality of the participants (including companies)?

Passwords on computer and on recording device (iPhone 5s), will be kept on person at all times;no names mentioned during the recording process.

6.1c If you are using interviews or focus groups, please provide a topic guide

These are potential interview questions that are linked to my key research questions.

Potential interview questions

1. How would you describe your organisation regarding its function as a platform where ideas and concepts emerge and come together?

2. Can you describe how your group exchanges ideas and knowledge among members?

3. How are these ideas and knowledge discussed and documented?

4. As you know there are different types of knowledge and information (such as scientific or social awareness). What type of ideas and information are mainly discussed?→ (and) how does the output look like when you summarise your findings?

5. Why do you think (name the knowledge types that interviewee has mentioned) are regarded as relevant?

6. How do you promote the results (knowledge) of your work?

7. How does your group communicate with policy makers and governmental bodies?

8. To what extent are you involved in policy/ recommendations and implementations?

9. Can you describe me a situation where the work of your group has achieved significant change in public policy?

7. Confidentiality and Data Handling

7.1a Will the research involve:

• **complete anonymity of participants** (i.e. researchers will not meet, or know the identity of participants, as participants, as participants are a part of a random sample and are required to return responses with no form of personal identification)**?**	☐
• **anonymised sample or data** (i.e. an *irreversible* process whereby identifiers are removed from data and replaced by a code, with no record retained of how the code relates to the identifiers. It is then impossible to identify the individual to whom the sample of information relates)**?**	☐
• **de-identified samples or data** (i.e. a *reversible* process whereby identifiers are replaced by a code, to which the researcher retains the key, in a secure location)?	☐
• **subjects being referred to by pseudonym in any publication arising from the research?**	☒
• **any other method of protecting the privacy of participants?** (e.g. use of direct quotes with specific permission only; use of real name with specific, written permission only)	☒
Please give details of 'any other method of protecting the privacy of participants' is used	
Since I am interviewing a small network of elite actors, it is almost impossible to conceal the identity of the interviewees. I am not asking any confidential or conflictual interview questions. Thus, I assume that all participants will be happy to be named. If some interviewees decide to remain anonymous, I will clarify before the interview that I will try my best in concealing the identity. I will also clarify that it will be very difficult and that they have to accept that their identity might be discovered indirectly through the content of their answers.	

7.1b Which of the following methods of assuring confidentiality of data will be implemented?
Please tick all that apply

data to be kept in a locked filing cabinet	☐
data and identifiers to be kept in separate, locked filing cabinets	☒
access to computer files to be available by password only	☒
storage at City University London	☐

stored at other site	☐
If stored at another site, please give details	

7.1c Who will have access to the data?

Access by named researcher(s) only **YES** ☒ **NO** ☐

Access by people other than named researcher(s) **YES** ☐ **NO** ☒

If people other than the named researcher(s), please explain by whom and for what purpose

7.2a Is the data intended for reuse or to be shared as part of longitudinal research?

YES ☐ **NO** ☒

7.2b Is the data intended for reuse or to be shared as part of a different/wider research project now, or in the future? **YES** ☐ **NO** ☒

7.2c Does the funding body (e.g. ESRC) require that the data be stored and made available for reuse/sharing? **YES** ☐ **NO** ☒

7.2d If you have responded yes to any of the questions above, explain how you are intending to obtain explicit consent for the reuse and/or sharing of the data.

7.3 Retention and Destruction of Data

7.3a Does the funding body or your professional organisation/affiliation place obligations or recommendations on the retention and destruction of research data?

YES☒**NO**

If yes, what are your affiliations/funding and what are the requirements? (If no, please refer to University guidelines on retention.)

University guidelines: Documentation should be stored safely and filed in a coherent, easily accessible format. Where documentation includes data relating to individuals, the researcher must ensure that this is stored securely and confidentially, is not kept for longer than necessary and is disposed of at the appropriate time with due regard to security and confidentiality. Where documentation is stored in electronic format, the researcher should ensure that back-up copies are maintained and kept securely. Hard copies of any key documents should always be kept. Responsibility for the provision and maintenance of suitable storage and secure disposal facilities rests with Schools who, within the University's management structure, are responsible for arranging with the University the identification, allocation and management of space and facilities to meet the needs of their staff and subject areas. The safe and secure storage of primary data, normally for at least ten years, and a safe and secure method of disposal after this time, all in accordance with the requirements of the Data Protection Act.

7.3bHow long are you intending to keep the data?

10 years

7.3c How are you intending to destroy the data after this period?

I will delete the data through a professional programme. In addition, I will physically destroy the hard disk.

8. Curriculum Vitae

CV OF APPLICANTS (**Please duplicate this page for each applicant, including external persons and students involved.)**

NAME:	Ceyhun Gungor
CURRENT POST (from)	PhD Student
Title of Post:	
Department:	Sociology
Is your post funded for the duration of this proposal?	Yes
Funding source (if not City University London)	Scholarship Committee of the *Studienstiftung des Deutschen Volkes* (awarded in 2015) + self-funding
Please give a summary of your training/experience that is relevant to this research project	
Research Master in Human Geography and Global Studies, Dissertation comprised qualitative expert interviews; I have work at the European Parliament (office for information and media); I worked at the Institute for Environmental Studies as a researcher.	

8.1 Supervisor's statement on the student's skills and ability to carry out the proposed research, as well as the merits of the research topic (up to 500 words)

Both David Barling (who has just left City University but retains a role as supervisor on this project) and I are entirely happy with the progress of Ceyhun Gungor on this project. This is timely and good research with a high element of theoretical pertinency. Mr Gungor has good experience of conducting interviews. We are confident that this research will be well conducted and be most illuminating.

Supervisor's Signature	[redacted]
Print Name	

9. Template for Participant Information Sheet

Participant Information Sheet

Title: Learning and knowledge transfer processes of non-competitive collaborative groups and their role in shaping food sustainability policy.

I would like to invite you to take part in a research study. Before taking part it is important that you understand why the research is being done and what it would involve for you. Please take time to read the following information carefully and discuss it with others if you wish. Ask me if there is anything that is not clear or if you would like more information.

What is the purpose of the study?

This study is part of a 3 year PhD thesis looking at the role of collaborative food groups as knowledge creators and providers for food policy.

Do I have to take part?

Interviews will be at a time and place that is convenient to you.

If you do decide to take part you will be asked to sign a consent form. You may withdraw at any stage or avoid answering questions which are felt to be too personal or intrusive.

What will happen if I take part?

- I will conduct an interview with you lasting in between 30 minutes to 1 hour at a time and place convenient for you.
- I will only need to interview you on one occasion.
- The interviews will involve 5-6 main questions and will take the format of a conversation
- The research will take place in the UK and Brussels, exact location dependent on participant

What do I have to do?

You will have to answer 6-8 questions.

What are the possible benefits of taking part?

My research project aims to further the understanding of how knowledge is created within collaborative food groups which could potentially have an impact on food policy.

What will happen when the research study stops?

Your data will be stored in a secure cabinet at research institute, as well as on my personal computer, which is protected by a password. The data may be used in future publications.

Will my taking part in the study be kept confidential?

- Both before and after anonymising the data, only I will have access to your information.
- If permission is given, I will record the interview.
- Your data will be archived in my computer and filing system however, no-one else will have access.
- If you provide consent, I may use your data in future publications. The same standards of anonymization will be applied.

What will happen to results of the research study?

The research study will inform my final PhD thesis. I will also try to publish certain elements of my research in academic journals and present them at conferences. The data will most likely lead to further publications over time. Anonymity of participants will be ensured throughout, unless stipulated otherwise. A copy of the final dissertation can be provided at request.

What will happen if I don't want to carry on with the study?

You are free to withdraw from the study without an explanation or penalty at any time. Any information you have given will be destroyed and not used in the study.

What if there is a problem?

If you would like to complain about any aspect of the study, City University London has established a complaints procedure via the Secretary to the University's Senate Research Ethics Committee. To complain about the study, you need to phone [redacted]. You can then ask to speak to the Secretary to Senate Research Ethics Committee and inform them that the name of the project is: **Learning and knowledge transfer processes of non-competitive collaborative groups and their role in shaping food sustainability policy.**

You could also write to the Secretary at:

[redacted]
Secretary to Senate Research Ethics Committee
Research Office, E214
City University London
Northampton Square

London
EC1V 0HB
[redacted]

Who has reviewed the study?
This study has been approved by City University London, Sociology Department Research Ethics Committee

Further information and contact details

[redacted]

Thank you for taking the time to read this information sheet.

10. Consent Form

Title of Study: Learning and knowledge transfer processes of non-competitive collaborative groups and their role in shaping food sustainability policy.

Please initial box

1.	I agree to take part in the above City University London research project. I have had the project explained to me, and I have read the participant information sheet, which I may keep for my records. I understand this will involve • being interviewed by the researcher • allowing the interview to be audiotaped • making myself available for a further interview should that be required	
2.	This information will be held and processed for the following purpose(s): as part of the researcher's PhD project. The identifiable data will not be shared with any other organisation. I understand that should I wish to be anonymous during this research, coding will be put in place to protect my identity from being made public. Otherwise I understand that I have given approval for my name and/or the name of my workplace to be used in the final report of the project, and future publications.	
3.	I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage of the project without being penalized or disadvantaged in any way.	
4.	I agree to City University London recording and processing this information about me. I understand that this information will be used only for the purpose(s) set out in this statement and my consent is conditional on the University complying with its duties and obligations under the Data Protection Act 1998.	
5.	I agree to take part in the above study.	

_____ _____ _____
Name of Participant Signature Date

_____ _____ _____

Name of Researcher Signature Date

When completed, 1 copy for participant; 1 copy for researcher file.

Researcher's checklist for compliance with the Data Protection Act, 1998

This checklist is for use alongside the *Guidance notes on Research and the Data Protection Act 1998*.Please refer to the notes for a full explanation of the requirements.

You may choose to keep this form with your research project documentation so that you can prove that you have taken into account the requirements of the Data Protection Act.

	REQUIREMENT	✓	
A	Meeting the conditions for the research exemptions:		
1	The information is being used *exclusively* for research purposes.	x	Mandatory
2	You are not using the information to support measures or decisions relating to *any* identifiable living individual.	x	Mandatory
3	You are not using the data in a way that will cause, or is likely to cause, substantial damage or substantial distress to any data subject.	x	Mandatory
4	You will not make the result of your research, or any resulting statistics, available in a form that identifies the data subject.	x	Mandatory
B	Meeting the conditions of the First Data Protection Principle:		
1	You have fulfilled one of the conditions for using personal data, e.g. you have obtained consent from the data subject. Indicate which condition you have fulfilled here: I will have obtained consent from the data subject	x	Mandatory
2	If you will be using sensitive personal data you have fulfilled one of the conditions for using sensitive personal data, e.g. you have obtained explicit consent from the data subject. Indicate which condition you have fulfilled here:	x	Mandatory if using sensitive data
3	You have informed data subjects of: i. What you are doing with the data; ii. Who will hold the data, usually City University London; iii. Who will have access to or receive copies of the data.	x	Mandatory unless B4 applies
4	You are excused from fulfilling B3 only if all of the following conditions apply: i. The data has been obtained from a third party; ii. Provision of the information would involve disproportionate effort; iii. You record the reasons for believing that disproportionate effort applies, please also give brief details here: _____ _____ _____ _____ N.B. Please see the guidelines above when assessing disproportionate effort.	n/a	Required only when claiming disproportionate effort
C	***Meeting the conditions of the Third Data Protection Principle:***		
1	You have designed the project to collect as much information as you need for your research but not more information than you need.	x	Mandatory
D	***Meeting the conditions of the Fourth Data Protection Principle:***		

1	You will take reasonable measures to ensure that the information you collect is accurate.	x	Mandatory
2	Where necessary you have put processes in place to keep the information up to date.	x	Mandatory
E	***Meeting the conditions of the Sixth Data Protection Principle:***		
1	*You have made arrangements to comply with the rights of the data subject. In particular you have made arrangements to:* i. Inform the data subject that you are going to use their personal data. ii. Stop using an individual's data if it is likely to cause unwarranted substantial damage or substantial distress to the data subject or another. iii. Ensure that no decision, which significantly affects a data subject, is based solely on the automatic processing of their data. iv. Stop, rectify, erase or destroy the personal data of an individual, if necessary. Please give brief details of the measures you intend to take here: _____ _____ _____ _____ _____	x	Mandatory

11. Additional Information

12. Declarations by Investigator(s)

- I certify that to the best of my knowledge the information given above, together with any accompanying information, is complete and correct.
- I have read the University's guidelines on human research ethics, and accept the responsibility for the conduct of the procedures set out in the attached application.
- I have attempted to identify all risks related to the research that may arise in conducting the project.
- I understand that **no** research work involving human participants or data can commence until **full** ethical approval has been given

[redacted]

Date	28th of July 2015



Undergraduate, Postgraduate & Research Programmes

Economics
International Politics
Psychology
Sociology

Northampton Square
London EC1V 0HB
Tel +44(0)20 7040 8508
Fax +44(0)20 7040 8580
www.city.ac.uk/social

Thursday, 17th September 2015

To whom it may concern:

This is to confirm that, on the 17th September 2015, the Research Ethics Committee of the Department of Sociology at City University London has approved the project 'Learning and Knowledge Transfer Processes of Non-Competitive Collaborative Groups and their Role in Shaping Food Sustainability Policy'.

The principal investigator of this project is Ceyhun Gungor, doctoral researcher at the Centre for Food Policy in the Department of Sociology at City University London.

Should you have any queries in relation to this matter, please do not hesitate to contact me at [redacted]

Regards

[redacted]

Senior Lecturer in Sociology
Editor of the *Journal of Classical Sociology*
Chair of the Sociology Ethics Committee
Department of Sociology
Rhind Building
City University London
Whiskin Street
London
EC1R 0JD
[redacted]