Understanding the role of social media in relation to alternative food networks: a case of Chester and its region

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Declaration page

The material being presented for examination is my own work and has not been submitted for an award of this or another HEI except in minor particulars which are explicitly noted in the body of the thesis. Where research pertaining to the thesis was undertaken collaboratively, the nature and extent of my individual contribution has been made explicit.

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Parts of this thesis have been presented at academic conferences, this includes;

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Understanding the role of social media in relation to alternative food networks; a case of Chester and its region

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Abstract

Alternative Food Networks (AFNs) are a system of food provision which is considered as the embodiment of the Sustainable Development (SD) agenda. They typically operate counteractively to conventional food networks (CFNs) seeking to reconnect all members in the supply chain through ethical and sustainable engagements. They are grounded by the theoretical underpinnings of quality conventions (Murdoch, 2000; Thévenot, 2002) and embeddedness notions such as alterity, valorisation, and appropriation (Dansero & Puttilli, 2014; Kirwan, 2004).

Many scholars have focused on exploring AFNs in various contexts, initially focusing on binary notions of dichotomy between AFNs and CFNs, then developing discourse in terms of assessing hybridity (Holloway et al., 2006; Maye, 2013; Ponte, 2016; Renting, Marsden, & Banks, 2003; Tregear, 2011). Recent studies have indicated the potential for further research concerning social media based AFNs (Bos & Owen, 2016; Reed & Keech, 2017; Wills & Arundel, 2017). Therefore a contribution in terms of further understanding this issue arises from this thesis.

The research was conducted in the midst of the referendum for the UK to withdraw from the European Union, the subsequent 'leave' vote resulting in a level of uncertainty in terms of policy implications. One policy implication may be that the UK will have to readdress the way it engages and supports its food and agriculture sector post-Common Agricultural Policy, therefore this research comes at a timely juncture.

This research adopts an interpretivistic epistemological stance, with a constructivist ontological position. Social network analysis (SNA) of Twitter connections was conducted in order to assess connectivity and density of the AFN that was present in Chester and its region. Content analysis of this network was then conducted in order to understand SD related terms and shortlist pertinent actors for further analysis. Interviews were conducted with nine actors from this network in order to critically evaluate their perceptions of SD from an online and offline perspective.

The results of the SNA suggest that the AFN of Chester and its region was not particularly well connected in terms of density. However, the SNA was a useful data collection tool, especially concerning the replicability and transferability of participant selection strategy.

Further results suggested that there was a need for more organisational structures to support AFNs in becoming more mainstream and collaborative. It was also clear that there was still a degree of opposition between CFNs and AFNs, despite hybridity. A final finding of the research is the consideration of smart localism.

The implications of this research are discussed, along with suggestions for future research including; the need to better understand leadership, relations between AFNs and CFNs, the role played by intermediates, and the expansion of social media based research.

Dedication

It has been my immense good fortune to have parents and two brothers who have always supported and encouraged me to achieve my goals. Although I do not see them, or my nieces and nephews, as much as I would like to, they are rarely far from my thoughts. I would not be the person I am today without them.

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Now it is my turn to make up all the evenings, weekends, and holidays missed during this busy period!

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List of Abbreviations

AFNs	Alternative Food Networks
ANT	Actor Network Theory
ALFNs	Alternative and Local Food Networks
CAP	Common Agricultural Policy
CFNs	Conventional Food Networks
CivFNs	Civic Food Networks
CSA	Community Supported Agriculture
CSR	Corporate Social Responsibility
CT	Conventions Theory
EC	European Commission
EU	European Union
FM	Farmers Markets
GRI	Global Reporting Initiative
GHGE	Greenhouse Gas Emissions
ISO	International Organization for Standardization
LEP	Local Enterprise partnership
MD	Managing Director
SPIDER	Sample, Phenomenon of Interest, Design, Evaluation and Research Type
SFSCs	Short Food Supply Chains
SME	Small and Medium-sized Enterprises
SNA	Social Network Analysis
SD	Sustainable Development
TBL	Triple Bottom Line
UK	United Kingdom of Great Britain and Northern Ireland
UNSDGs	United Nations Sustainable Development Goals
USA	United States of America
VISIS	Vision Indicators, Systems, Innovation and Strategy

Chapter 1. Introduction

"Ignorance more frequently begets confidence than does knowledge: it is those who know little, and not those who know much, who so positively assert that this or that problem will never be solved by science"

Charles Darwin,
The Descent of Man (1871)

1.1 Orientation and overview of the research project

The food sector in the UK is at a crossroads. On the one hand, there is an ever-increasing price squeeze at the supermarket level, which feeds back through the supply chains in the food sector resulting in disproportionate returns throughout. Moreover, there are debates surrounding the 'lock-in' effect which occurs when large multinational organisations effectively trap their suppliers in an unfair buyer-seller relationship (Touboulic, Chicksand, & Walker, 2014). There is a hegemony of conventional food networks (CFNs), who are well financed, able to control retail outlets of food and drink, along with distribution and production methods, thereby creating unfair relationships between some actors within these food networks. Furthermore, price conscious consumerism has led to traditional products with attributes associated with taste, tradition, local specificity left in a position whereby they are not abundantly available for consumers. Rather, there is an abundance of standardised, and general products which could be retailed anywhere, often with longer shelf lives, and developed through industrial production and manufacturing processes.

There is a perpetuation of brand products that have limited levels of information regarding the production process, thereby developing a normative relationship with food, whereby most consumers do not know where their food comes from in real terms. This standardisation and generalisation of brands, along with low prices has led to price conscious consumer behaviour which has a disconnection with their food. Beyond the domestic market, there has been a long-standing debate on how best we feed our growing populations. Currently, the global trend has overwhelmingly favoured large-scale industrialised agricultural practices, which produces high yields, mostly reliably and for quantifiable costs.

When this agriculture and food production system is paired with large-scale supply chain management systems that distribute produce around the globe and make it highly accessible and affordable through supermarkets and chain restaurants, this trend is somewhat justified. However, when we look at the true cost of this food production and distribution system we see a myriad of hidden costs which are picked up by others in the supply chain and not necessarily by the end consumer (Carolan, 2013; O'Kane, 2012).

On the other hand, there has been much interest recently in the concept of alternative food networks (AFNs) and its relevance to food supply chains, particularly geographically specific and even local. Maye and Kirwan list: "*sociology, human geography, anthropology and agri-food studies more generally*" (2010, p. 1), as the main body of social science based topic areas.

The broad range of topic areas in a variety of academic disciplines focus on themes such as cultural, political, societal, and management studies, and will, of course, all have focal areas of theory and approach this topic differently. These networks typically focus on quality and territoriality of produce and are often focused on redressing some of the issues highlighted above. Rather than chain restaurants and cafés, supermarkets and national wholesalers, AFNs typically retail and distribute on a local or regional basis, using cooperatives, farmers markets (FMs), independent cafés, restaurants and farm shops. Production methods are less industrial, often small scale and using agro-ecological farming practices where possible, such as organic or free-range for example. They are also associated with community supported agriculture (CSA), pick-your-own and box schemes, and cooperative retail outlets. As a result, more specific produce and products are associated with these networks, with the emphasis being on distinctiveness and difference from the conventional.

AFNs are seen as existing in opposition and in conjunction with the conventional mainstream food networks, however recent developments in this field have moved towards matters of concern over matters of fact (Hill, 2014). An example of matters of concern comes from Colin Sage's 2014 critique of the positioning of AFNs, who suggests that we must "*build international solidarity in defence of food sovereignty and establish a global coalition opposed to the corporate agri-food agenda of biotechnologies, land grabbing and nutritional impoverishment"* (Sage, 2014, p. 254). Another matter of concern involves the potential routes to market and AFN actors' attempts to limit the number of intermediates in the food supply chain, whilst also focusing their activities within a geographical territory (Kneafsey et al., 2013; Parker, 2005 as cited in Benedek, Fertő, Baráth, & Tóth, 2014).

The two main opposition factors that are associated with AFNs when it comes to the type of product are quality conventions and fair price of the product. Although this does not mean to say that AFNs cannot provide food and drink that lacks quality, and does not always account for the true cost of the product. The heterogeneous nature of AFNs has led to much scholarly discourse concerning notions of quality, which falls under the theoretical underpinnings of Conventions Theory (CT) (Biggart & Beamish, 2003). Studies using CT are primarily focused on understanding both the context in which market orientation occurs and also the situation orders of worth, or 'quality', that makes up the collective action of a network (Dubuisson-Quellier, 2013; Freidberg, 2003, p. 99). CT is one of the two key theoretical underpinnings of AFNs, along with Embeddedness theory. Over the past ten years or so, research has been growing in the area of AFNs and their sustainable supply chain management (Goodman & Goodman, 2009; Ilbery & Maye, 2005a; Kneafsey, 2013; Stassart, Whatmore, & Renting, 2003; Tregear, 2011).

Notions of social embeddedness are of popular discourse in the literature; for example, social connectivity, reciprocity and trust, characteristically underpinning social embeddedness (Sage, 2003). Ecological embeddedness is also a topical issue; examining the environmental, ecological and landscape issues which appeal to traditional notions of sustainable development (Morris & Kirwan, 2011). There is a substantial debate as to whether local is 'better' in terms of environmental stewardship, with fewer food miles being a somewhat disputed measurement of sustainability (Edwards-Jones et al., 2008), whilst also recognising the potential of a 'local trap' occurring, similar to conventional lock-in, where one indicator of an AFN plays a superior role and disrupts the movement's values (Born & Purcell, 2006). A further issue is the extent to which the socio-economic benefits of local employment and wealth generated from the food sector either remains or leaves in the local economy, and also it is still questionable whether conventional or alternative food networks can solve problematic inequitable social problems such as employment and public health (Albrecht et al., 2013). Despite this, there are many counter assertions to discredit this 'local is better' hypothesis (Ilbery & Maye, 2005b), as a 'local wash' can occur whereby local does not mean sustainable (Cleveland, Carruth, & Mazaroli, 2014). There are issues with quality; firstly, not all local food and drink actors produce high-quality products, some see their business as a 'lifestyle business' whereby they either employ a friend or relative or nobody at all, they make very little money, often not enough to cover the cost of their labours, and contribute little to the wider economy. In terms of providing food and drink in any meaningful competition with supermarkets, then there are well-defined issues that are closely linked with supply chain management such as; frequency of delivery and quantity of produce available (Kneafsey, 2013).

1.2 Justification

1.2.1 Indicating the gap

Surprisingly, there has been little attention paid to using social network analysis (SNA) as a tool to depict what an AFN actually looks like in a practical setting. SNA can be used in order to graphically and quantitatively depict what a given network can look like (Pisani & Burighel, 2014).

Further to this, and specifically in the context of participants/samples used in research on this topic, SNA may be used in order to provide a sample size that is transferable and replicable in a different geographical area.

Some studies go to great lengths to inform the reader of the characteristics of the participants used in their research (for example Myers and Sbicca (2015). However, for a researcher looking to replicate a given study on AFNs in their own geographical area of concern, this can be problematic to replicate exact AFN group types, particularly in rural and sparsely populated areas, or internationally.

Practical considerations for researchers, particularly individuals, students, or isolated researchers with limited budgets and time constraints are neglected. As there is a plethora of AFNs across the UK, probably too many to quantify given the intangible and often difficult-to-define status of a particular network, it would be prudent to develop a data collection system which can easily define a given network.

Further to this, there does not appear to be any research in this field that depicts a food network on the basis of 'business to business' social media interactions. Social media has revolutionised the way in which businesses engage with each other and the customer and can be seen as a resource by SMEs (Bocconcelli et al., 2017). As a result of this potential connection between actors throughout the supply chain of a network, from the primary producer to the consumer, it is worth investigating this area further. Furthermore, this issue has not been given much attention in the context of AFNs, which suggests that this concept is still in its theory-building stage of development, thereby requiring more case study exemplars of theory in practice, as stated by Bos and Owen (2016); and Wills and Arundel (2017).

This being said, one of the key limitations of understanding the perceptions of AFN actors toward the SD agenda is that the interpretivist nature of qualitative research cannot be easily generalised, as there can be a plethora of differing opinions on a given topic. Geographical areas are an important factor, and age, gender, and socio-demographics of the participants selected are all variables to consider. Therefore, undertaking research that has secondary data specifically linked with the research participant that is available in the public domain such as on social media platforms, can help to further substantiate claims made during interviews.

Goodman, DuPuis, and Goodman (2013) highlights the problematic and diverse nature of the conventionalization of AFN principles, and argues along with John Wilkinson (Wilkinson, 2009), that the problematic and prominent nature of this topic deserves future research. This being said, it would be interesting to investigate where AFN actors see themselves in relation to CFNs, along with their perceptions concerning the marketisation of their own movement's values.

1.2.2 Indicating questions/ problems

The key issue of discussion and enquiry lies in the understanding of whether or not the heterogeneous nature of AFNs means that they are in a position to provide a meaningful 'alternative' to the present hegemonic dominance of CFNs. In a given research area, are they sufficiently connected and organised to help highlight the dichotomous nature of AFNs vs CFNs, and what role does social media play in their connection (Bos & Owen, 2016; Wills & Arundel, 2017)? Is it still the case that these AFNs serve little more than lifestyle companies that offer little impact on the society and economy?

Has the agenda of local, organic, provenance discourse simply moved to one of price and value for money given the post-recession economy? It may be the case that given the current political climate in the UK being centralised on the issue of its withdrawal from the European Union (EU), also known as Brexit, that AFNs are in a key position to exploit this opportunity to assert their significance.

A further question is that it still remains unclear as to the extent that AFNs embrace the Sustainable Development (SD agenda) (Cleveland, Carruth, et al., 2014), or are these alternatives simply exploiting this niche mode of food production and distribution for their own economic advantage, much like CFNs exploit certain aspects of the SD agenda themselves? Therefore, research exploring AFN actor views on their business and supply chain activities is essential to try and clear up any ambiguities, especially in understanding what is meant by SD in practice rather than just theory.

1.2.3 Importance of the topic

The importance of the topic area cannot be underestimated. At the time of writing this thesis, the food sector in the UK is in a state of uncertainty. With the referendum for the UK to leave the EU resulting in a planned withdrawal, we are sure to see many political implications for our food sector. One policy implication is that the UK will have to readdress the regulatory and legislative measures that are currently in place, either to implement the *Repeal Bill* (formally known as the "European Union (Withdrawal) Bill") whereby the UK keeps the same rules and laws (DExEU, 2017), or develop new ones for itself. This could be low risk in terms of uncertainty, as the transition of legislative and regulatory powers goes from Brussels to London, in a fashion whereby the UK effectively 'mirrors' the EU food sector rules and laws, which would be beneficial for food and drink companies who export and import to use the same regulations as the EU set. However this being said, legislation and regulations will continue to evolve, and unless the UK is willing to also match these changes on a long-term basis, then the uncertainty in the food sector may rise.

The alternative would be that Britain develops new legislation relating to the food sector; this may cause more risk and uncertainty as food and drink companies would have to update their regulatory compliance. Furthermore, the UK government may choose to relax some of its food standards legislation to that of their future potential trading partners, such as the United States of America (USA). The United States' government has a long history of aligning regulation in conjunction with industry in the form of large multinational food and drink companies, such as controversial CFN actor Monsanto, over the concerns of the public, "*for example, with industry representatives populating official posts through a "revolving door" phenomenon*" (Graff, Hochman, & Zilberman, 2009).

If the well-financed and publically (by government) supported United States food sector has new opportunities to export to the UK, this will be problematic for our own food and drink companies in terms of competition.

A second policy implication of leaving the EU with regards to the food sector is the amount of financial assistance the agricultural sector currently receives by way of subsidies as a result of the UK's adoption of the Common Agricultural Policy (CAP) of the EU. Primary producers of food and drink (for example, dairy farmers) will face uncertainty with regards to their funding. The message currently coming from the government is that farming subsidies will be matched until 2019; afterwards is not clear, as, at the time of writing this thesis, this has not been confirmed. Therefore, while the current and previous food production systems have been supported by subsidies, the next generation of farmers and growers may find that there are not the same financial support mechanisms in place. Furthermore, given the current government spending reduction and deficit reduction ambitions, it may be prudent to assume that this may be a long-term bipartisan trajectory. In essence, the way in which we produce our food and drink needs to be fit-for-purpose in the financially and politically uncertain times ahead. The UK government may wish to explore a range of alternatives to the current business-as-usual subsidies when it comes to maintaining a healthy supply of food, at affordable prices, in a more durable and sustainable manner. However, both CFN and AFN actors will need to take responsibility for their business activities if they are to remain in operation in the future.

1.2.3.1 Justification for future research

The literature review chapter of this thesis presents many justifications for future research beyond of course the recent Brexit situation in the UK, although there were calls from the literature for *"further investigation into the potential transformation from the AFN by documenting, theorizing, and probing the political potential of these new confrontation based alliances and their pursuit of more healthy and fair agrifood systems"* (Myers & Sbicca, 2015, p. 25). There is scope to develop an understanding of how AFNs can be scaled up and operated on a larger scale; "*Research in the next five years should focus on understanding current infrastructure, networks, and distribution options for alternative food systems, as well as the ability for some alternatives to make use of more conventional food system networks"* (Albrecht et al., 2013, p. 155).

More recent publications have also cited the need to explore the *"producers point of view about the redistribution of economic value along the chain and their bargaining power on price"* (Berti & Mulligan, 2016, p. 24), thereby specifically referring to the need to further understand specific food and drink companies views towards intermediates, or go-betweens, within supply chains.

It is still not clear as to the extent of AFN characteristics and practices in an indirect sense, they *"may be highly significant in addressing sustainability" (Forssell & Lankoski, 2014, p. 72).* Other literature further indicates that there is a need not just to assume that AFNs are somehow better forms of food provisioning; "*social and ecological outcomes of each rescaling never must be assumed but always subjected to critical analysis*" (Born & Purcell, 2006, p. 197). Therefore research must be sceptical and critical of claims present in current literature, and where possible attempt to have independent verification of any opinions given.

Other researchers have encouraged investigating the rhetoric of sustainability designated practices, as well as the reality of what actually occurs in relation to the wider food-systems goal (Grivins & Tisenkopfs, 2015). The example of the organic movement or issues of localness are potential areas of enquiry here. With this there is a need for "*more transdisciplinary research is also needed on the tensions between the increasing pressure towards standardisation"* (Roep, 2006, p. 23).

Building upon the need to investigate practices is the notion that there need to be more qualitative approaches in the;

> "e*xamination of ecological embeddedness across a number of AFNs to reveal the various ways in which they become ecologically embedded, through diverse environmental values, practices and promotional strategies on the part of producers and the negotiation of these by consumers, and the relative importance of ecological concerns within their development and operation" (Morris & Kirwan, 2011, p. 328)*.

Therefore, by investigating the qualitative, potentially subjective reasons why producers chose to grow or rear produce in a given way may be of value to the topic area. This could shed light on social and ecological embeddedness efforts such as social inclusion and environmental stewardship.
It is clear that there is still a level of fragmentation within the food sector, even amongst AFN actors. This issue needs to be further investigated, as highlighted by Goodman et al. (2013) who state that we must investigate whether or not "*these divisions have weakened resistance to 'the appropriation processes set in motion by the dominant socio-technical regime'. These problematics deserve a prominent place on future research agendas"* p. 430.

Therefore, viewing the degree of connectivity within a given network may prove important to uncover further meanings behind divisions and potential conflict. Sonnino and Marsden (2006b) further cite the need for "*a stronger understanding of the nature and dynamics of the relatively embedded competitive spaces occupied by conventional and alternative foods*" p. 196. With this also comes the somewhat longstanding need for "*more research into the functioning of local food economies in general*" (Watts, Ilbery, & Maye, 2005, p. 35). This being said, it is, therefore, justifiable to use a given territorial example as a study area of enquiry.

With regards to considering participant selection for future research, it was deemed important to ensure that this stage of the research project was conducted in as rigorous a way as possible in order to recognise comments made in the literature criticising this part of the research design. An example of such criticism comes from a study concerning methodological considerations for those researching AFNs in Europe which states that; *"the reader can often only assume that contact and selection of such cases was due to geographical proximity and/or prior knowledge of, or interaction with, members of the scheme, as many papers fail to reflect or comment upon the identification, selection and wider relevance of their cases"* (Venn et al., 2006, p. 253). As a result of this concern, albeit from some time ago, it was evident from the literature review that this issue was still pertinent at the time of writing this thesis.

Research by Holloway, Kneafsey, Venn, et al. (2007) supported Venn et al's (2006) assertion by stating that; "*Methodologically, then, we encounter a need to be able to formulate a strategy for working through very different examples of food production– consumption to assist in moving towards a fuller understanding of how they are assembled and how they function in their specific local contexts*" P. 2. When applying this methodological consideration to more recent studies, we can see the potential for further research concerning social-media-based AFN connections, as highlighted by Bos and Owen (2016) who advocate more; "*in-depth ethnographic studies exploring both online and offline behaviours"* p. 13. Therefore a potential contribution in terms of addressing this issue is considered as an output of this thesis.

It was also apparent that there was a need to encourage the breaking of new boundaries within debates and exchanges surrounding AFN discourse, as expressed by Tregear (2011); for example by the need to further explore a deeper understanding of how networks assemble without centralised structures (Levkoe & Wakefield, 2014). This further supports the justification for using social media as a reconnection medium, as dialogue and discussion on a given topic of interest can take place without organisational structures.

As the review of the literature reveals, there are many exemplars of calls for conducting research on AFNs in relation to examining their sustainable development efforts and organisation in general. It is evident that not all of these justifications can be considered in equal detail, however, it speaks volumes in terms of justification for future research such as this study. This being said, this thesis was not limited to the issues presented here.

1.3 Focus of the Research

1.3.1 Research Aim and Objectives

Research Aim:

To investigate the role played by online (social media) connections as a means to enhance the understanding of alternative food networks in the context of sustainable development from an online and offline perspective.

Objective 1:

Contextualise the need for the research by critically examining the literature concerning alternative food networks in developed economies;

Objective 2:

Explore AFN online practices by using a social media platform from which to gain an understanding of sustainable development related content, and actor connections in general terms using Social Network Analysis;

Objective 3:

Critically evaluate AFN actor perceptions of sustainable development from an online and offline perspective in relation to current scholarly discourse;

Objective 4:

Provide conclusions and recommendations that support the understanding of AFNs in an online and offline setting in order to aid further research and theoretical development, and identify potential policy implications.

The research objectives have been selected in order to aid in the successful completion of the overall research aim, as a result, each objective should be seen as sequential in nature. Objective 1 consists of a critical examination of the literature pertaining to the topic of alternative food networks in developed economies. This is chiefly achieved through Chapter 3, the literature review; *Alternative Food Networks an evolving theoretical landscape*.

This chapter covers the two main theoretical underpinnings of AFNs; Embeddedness and Conventions Theory, enabling the research to formulate a sufficient understanding of the topic area which in turn helps inform the methodology chapter (Chapter 4), and subsequent discussion, analysis, conclusions and recommendations in relation to the data collected. Objective 2, is fulfilled by conducting SNA on the Twitter-based AFN that is present in Chester and its region. This is evident in Chapter 5, *Social Network Analysis: A case of Chester and its surrounding area*. Here, research of an online AFN using Twitter is explored. However, prior to conducting the research in this chapter, the methodology chapter (Chapter 4) presents a clear account of the research philosophies and research design of this thesis which helped to inform the rationale behind Chapter 5. Objective 3 is primarily concerned with analysing and discussing the information acquired through the literature review, the SNA, and the interviews conducted with AFN actors. Chapter 6, *Discussion and Analysis; triangulation of social network analysis, interview results, and existing scholarly discourse*. With the successful completion of objectives 1-3, this research then focuses on providing recommendations concerning AFNs in this context, this is achieved through objective 4 in Chapter 7*, Conclusions and recommendations*.

1.3.2 Thesis Structure

Chapter 1 served as an introductory chapter to the thesis. The chapter started with an orientation and overview of the research project covering general statements that are of importance to the topic area, with references to some key justifications for research from studies within the literature on this topic area. The justification for the study, indicating the gap in knowledge, and an indication of the value of further research is presented. The chapter summarises the focus of this research project, including a statement of the aims, the thesis structure, limitations, methodology, and an evaluation of expected outcomes.

Chapter 2 provides this thesis with the background context of this research, including an account of the planetary boundaries framework which frames the challenges facing us as a society. An introduction to the SD agenda is presented, defining SD in its broad context, and then in the context of food and agriculture. Pertinent macro socio-economic and environmental indicators are analysed which serve as a justification for the SD agenda importance in AFN discourses. The chapter then provides an outline of the EU and UK food sector context, which includes policy references pertinent to this thesis.

Chapter 3 serves to define and explain the current debates surrounding the context of AFNs. Key definitions are discussed and the theoretical links between sustainable agendas and are explored.

The chapter starts by outlining the research strategy used in order to conduct the literature review. The chapter then is concerned with the review of the literature on AFNs, focusing on the two main theoretical underpinnings of AFNs; Embeddedness and Conventions Theory. The chapter summarises highlighted gaps in the literature.

Chapter 4 covers the methodology of this thesis and is split into two sections; the research philosophy and research design. Firstly, an account of the research philosophies that underpin the research is presented, which includes the ontological and epistemological stances considered and adopted. Secondly, the research approach itself, which covers the research design including interview techniques, sampling strategy, how access to participants was gained, along with the ethical considerations of the research, is also presented. The chapter concludes with an explanation of how the data collected in this study was analysed and synthesised with the literature.

Chapter 5 describes and explains the SNA that was undertaken in order to obtain an understanding of the AFN in Chester and its region. The chapter starts by introducing what is meant by the term networks by citing graph theory in this context. The chapter then covers the SNA protocol that was adopted to construct a sociogram of centrality and density of the network. The results of the SNA are also presented in this chapter. As a result of conducting the SNA and creating a sociogram for the network, content analysis of tweets is discussed. Finally, the chapter identifies the AFN actors selected for interviews, and the chapter then concludes with some preliminary considerations as to the limitations of using SNA in this way.

Chapter 6, the discussion and analysis chapter, starts out by investigating the dichotomous relationship between CFNs and AFNs, which is concerned with views from participants regarding supermarkets, the true cost of food, the AFN movement's values in general, and the relationship that is present between AFNs and CFNs. The chapter then presents a narrative of local tensions between two cooperative organisations, with a particular focus on analysing territorial tensions between AFN actors.

The chapter progresses onto the interviewees' account of industrial quality conventions, specifically labelling and regulation. Debates surrounding tensions, favouritism within Twitter networks, the lack of physical structures and organisational support for AFNs are considered together with some of the challenges of dealing with CFN actors.

This leads to a discussion and analysis regarding the organic movement. This contentious issue was examined in detail from the perspective of farm shops and food and drink companies and covered broad issues concerning demand from customers and misconceptions. Ecological embeddedness was also covered, including participant's relations with social aspects of sustainability. The chapter also concludes with a debate concerning procurements and intermediates within the Chester AFN. This issue is summarised with an account of contract disputes, issues of frequency of supply, and relationships with wholesalers.

Chapter 7 presents the conclusions from the data collection and analysis chapters (5 and 6) and considers the contributions that the thesis has made to the knowledge base. It also provides recommendations for policymakers, AFN actors, and future researchers.

1.3.3 Limitations

It is not the purpose of this study to test the theory that, for example, AFNs are more embracive of the SD agenda than CFNs, but rather to contribute to theory building attempts of other scholars on this topic area. As there is not yet sufficient empirical evidence to comprehensively and quantitatively answer the assertion that AFNs embrace the SD agenda more than conventional food networks, it is pertinent and of value to the topic area that more examples of AFNs in practice are qualitatively explored and presented. This will help in developing a greater understanding of the topic area in practice. This research does not attempt to generalise any of the outcomes of the data collection, nor does it describe or compare examples of AFNs against one another. Instead, it seeks to present a method by which examples of AFNs can be quantifiably measured and then qualitatively explored and understood. The proposed method of using SNA to depict and quantify an online representation (through Twitter in the case of this research project) of what an AFN looks like in practical terms can possibly be used in order to then conduct much deeper analysis of its characteristics and features. This being said, the proposed method is only demonstrated in the context of one AFN in Chester and its surrounding area, therefore the results of the study can by no means suggest that this can for certain be implemented elsewhere. However, as Twitter is widely used by many food and drink actors on an international basis, it is hoped that the method itself can be implemented elsewhere.

A further limitation is that the SNA of Twitter users only covers one social media platform. The obvious limitation with this is that some food and drink companies do not use social media at all, or rather they use other platforms such as Facebook, for example.

A final limitation is a practical and somewhat common one with PhD research projects; a limited amount of time and only one researcher to conduct the research is a dual constraint in itself. If there was more time available and greater capacity to conduct the SNA and subsequent interviews with selected participants with other AFNs, then there would, of course, be more data available upon which to draw more generalisable conclusions and recommendations. This being said, the sample selection process has been designed in such a way as to allow any further researcher the ability to replicate this study in a different area of the country, or globally, and thereby increase the transferability and scalability of this research.

1.3.4 Methodology

The approach to this research is characterised by an ontological stance of constructivism. The epistemological assumption is interpretivistic in nature and is concerned with theory building rather than theory testing. This methodological stance has been selected on the basis of the conclusions drawn up from the results of the literature review on the subject of AFN. There is a consensus in the literature that there need to be more case study examples of AFNs and in an attempt to contribute and answer this research demand, this research seeks to offer transferable and scalable results.

The data on which the discussion and analysis were based comprises of two key parts; firstly the interviews conducted with selected actors within the chosen AFN, and the SNA and content analysis of Twitter AFN actors in order to triangulate meaningful and deeper conclusions.

1.3.5 Evaluation of expected outcomes

This study aims to offer the scholarly community a more rigorous method of obtaining a depiction of what an AFN looks like in terms of actors and connections between them. Once an AFN is graphically represented, actors within the network can be selected in order to develop an understanding of the network. It is expected that the data collection strategy for participant selection can be transferred to other geographical areas and be scalable to much larger settings. The methodology could help to better identify hybrid actors who are operating on the fringes of both CFN and AFNs, in doing so, they can be better targeted for study, support, and integration within the AFN movement.

An additional expected outcome is to gain a deeper understanding of the challenges facing participants in this study's selected AFN, and ascertain what their views are towards SD and AFNs in general. There is some evidence to suggest that by using a replicable data collection strategy for participant selection, the deeper understanding gained can be compared with what other actors say in different AFNs. This will help in theory building in the context of AFNs and SD as more case study examples can potentially be obtained.

Finally, it is expected that the SNA and subsequent content analysis will present the researcher with some practical problems involving computer software. It may be the case that selected software packages are out-of-date with newer technological advances occurring over time for example.
Further to this, it also is expected that the full extent of an AFN's actors are not represented online as is most certainly the case that not all those in the food sector have an online presence, much less a Twitter account that is connected to their business network. To this extent, attempts are made to discuss this issue further with participants in order to help refine the realistic expectations and limitations of using SNA of Twitter actors within an AFN as a viable way of representing a network.

1.3.6 Background of research area: Chester and its region.

Chester is a walled city in the North West of England with a population of approximately 66,000, which sits within a wider county population in Cheshire at 338,000 (CWAC, 2018b). When referring to Chester and its region, this thesis is limiting its search to the localities surrounding the city itself; this includes the district of Cheshire West and Cheshire which is the unitary authority for the geographical area. As Chester boarders North Wales, actors from this geographically close area to the city and county were included as potential participants. An example of where the unique position of Chester and its region is linked in a business context is the West Cheshire and North Wales Chamber of Commerce which, as their name suggest, operates cross border. When examining Cheshire West and Chester's (CWAC) Gross Value Added by Industry, using the economic dashboard of the local authorities statistics (sourced from the Office for National Statistics), it is clear that the two measurements of manufacturing, which includes food manufacturing, and distribution, transport, accommodation and food are significantly important. Manufacturing accounts for 22.8% of CWACs GVA, 25% by value of the North West's manufacturing output, which employs over 24,000, and accounts for one of the key sectors along with; life sciences, energy and environment, chemicals, finance and business services and logistics and distribution (CWAC, 2018a).

Chapter 2. A background to Sustainable Development agenda

"Our loyalties are to the species and the planet. We speak for Earth. Our obligation to survive and flourish is owed not just to ourselves, but also to that Cosmos, ancient and vast, from which we spring".

Prof. Carl Sagan
Cosmos: A personal Voyage: Episode 13 Who Speaks for Earth? (1980)

2.1 Chapter introduction

This chapter provides the background context of the food sector in the UK and covers pertinent theoretical underpinnings from the Sustainable Development agenda.

2.1 Objectives of the chapter

The main objectives of this specific chapter are to;

- Provide context as to the challenges facing our food sector;
- Conceptualise the Sustainable Development Agenda;
- Outline the EU and UK positions regarding the food sector.

2.1.2 Structure of the chapter

The chapter starts by introducing the global indicators and challenges that justify the need to change 'business as usual' when it comes to the way we interact with the environment, chiefly by citing the Planetary Boundaries Framework. Due to the extensive research on the SD concept, and its broad adoption across many academic disciplines, the purpose of the next section of the chapter is to outline the theoretical underpinnings typically associated with the SD concept, rather than to review the relevant literature on this topic. The chapter then examines what is meant by CFNs through a critical discussion of various points concerning their supply chains. Finally, it presents an outline of the EU and UK food sectors, covering the CAP, EU policy towards SD, and Brexit, plus what it might mean for the UK.

2.2 Global indicators and challenges

Anthropogenic activities are increasingly influencing the Earth's climate (IPCC, 2014) and ecosystems (Ellis et al., 2013). "*Human life is only made possible by complex, and extremely delicate balance of processes: atmospheric, hydrological and biological*" (Dickens, 2014, p. 282). However, some of nature's systems are struggling to cope with what we require from them, and, with the global population set to increase from approximately 7.3 billion to 9 billion by 2050 (Godfray et al., 2010), it is likely that pressures on global systems will increase unless a change occurs.

There is a myriad of environmental challenges facing the planet; perhaps the most widely publicised and topical being that of climate change. The United Nations Framework Convention on Climate Change (UNFCCC) defines *climate change* as "*a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods*" (UNFCCC, 1992, p. 7). Climate change as a result of human activities, albeit unintentionally, is a 'side effect' of the technology we have developed. It has the potential to significantly alter life on this planet, especially when examining the ecosystems and associated 'services' they provide. It is agreed by those nation states that have signed the UNFCCC treaty that reductions in emissions should enable future global warming to be limited to below 2^{o}C (3.6^{o}F) above the pre-industrial level (Rockstrom et al., 2009, p. 32). However, if the average global temperature increases beyond 2^{o}C, compared to pre-industrial revolution temperatures, this could lead to the extinction of approximately 50% of the world's plant and animal species.

With increases in the parts-per-million (ppm) of GHGs (such as Carbon Dioxide (CO_2), Methane (CH_4), and Chlorofluorocarbons (CFCs)), so comes an increase in atmospheric temperature (see IPCC, 2011; 2007; 2014). As average surface temperatures increase, certain bacteria cannot survive, and as a result plants and animals which have a symbiotic relationship with them in the ecological food chain will suffer due to imbalances, and we humans, amongst other large mammals, birds and reptiles, at all levels of food-chains will ultimately be at risk (Fussmann, Schwarzmüller, Brose, Jousset, & Rall, 2014), thereby affecting the biodiversity of ecosystems as a whole (Hooper et al., 2005). There are likely to be far-reaching implications for ecosystems as a result of climate change, which will ultimately affect the services they deliver. An example of such a service is soil-systems which are chiefly exploited for agriculture and food production (Lang, Rall, Scheu, & Brose, 2014). Healthy soil systems are the pre-requisite for arable land and fertile growing conditions in agriculture, therefore it is imperative that such indicators are factored into our systematic viewpoint and thinking on these issues.

2.2.1 Planetary Boundaries Framework

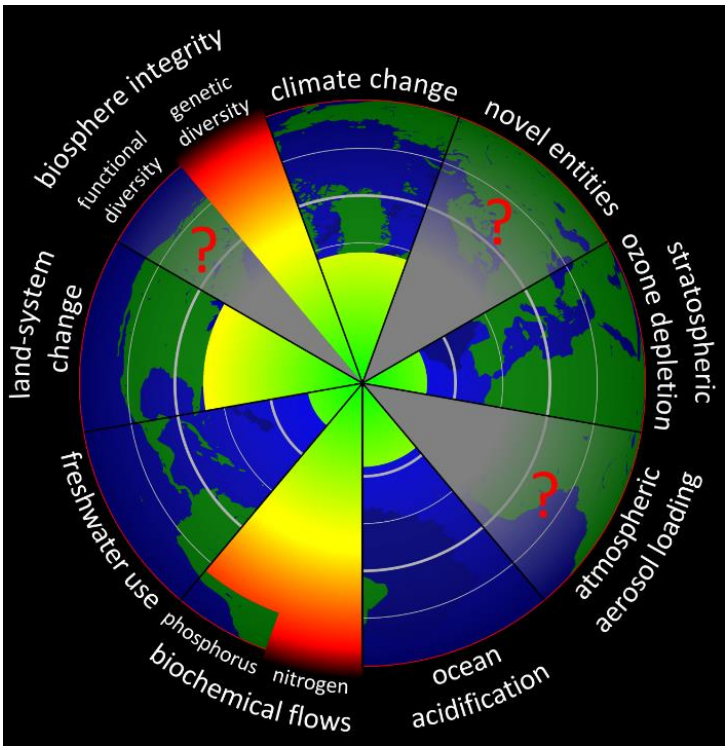
The environmental situation would be challenging enough if climate change were the only human-induced global environmental indicator but of course, it is not. Research published by the Stockholm Resilience Centre proposes a "*new approach to global sustainability in which we define planetary boundaries within which we expect humanity can operate safely*" (Rockstrom et al., 2009), coining the term *'Planetary Boundaries'*. The Planetary Boundaries have emerged in order to establish what constitutes unacceptable human-influenced global environmental change and will be used to classify the major issues facing our planet and provide a basis on which to introduce the need for SD in the research project.

List of Planetary Boundaries

Climate change; ocean acidification; stratospheric ozone depletion; atmospheric aerosol loading; biogeochemical flows; Interference with P (phosphorus) and N (Nitrogen gas (N_2)) cycles; global freshwater use; land system change; rate of biodiversity loss; chemical pollution.

Figure 1 provides a visual representation of the planetary boundaries using a traffic light system where the red bars show areas of a planetary boundary which are currently operating at 'beyond the zone of uncertainty or High Risk'. The amber colour denotes a zone of uncertainty or increasing risk, whereas the green shows the safe operating space, below the boundary level.

Figure 1 Planetary Boundaries Diagram (Source: http://www.stockholmresilience.org/21/research/research-programmes/planetary-boundaries.html)



As Figure 1 shows, many of the planetary boundaries are closely linked with agriculture and food production, notably the biosphere integrity and biogeochemical flows (nitrogen, for example, is a commonly used fertiliser in agriculture and food production).

Figure 2 demonstrates the planetary boundaries framework as "*Combining the social foundation with the environmental ceiling, creating a doughnut-shaped area between these social and planetary*

boundaries. It is an illustrative depiction of a safe and just space for humanity" (Raworth, 2012, p. 15). It underscores the social foundations of our economy in relation to the boundaries. This speaks to the concept of SD; where we recognise that we must meet our social and economic development goals within the limits of the confines of the resources and ecosystems which sustain it.

To summarise, there is a clear scientific consensus concerning the challenges facing our planet when it comes to climate change studies, and there is a plethora of literature available to support the studies such as the planetary boundaries framework, for example; warming oceans (Levitus et al., 2009); shrinking ice sheets (Kwok & Rothrock, 2009); decreased snow cover (Derksen & Brown, 2012); and ocean acidification (Sabine et al., 2004).

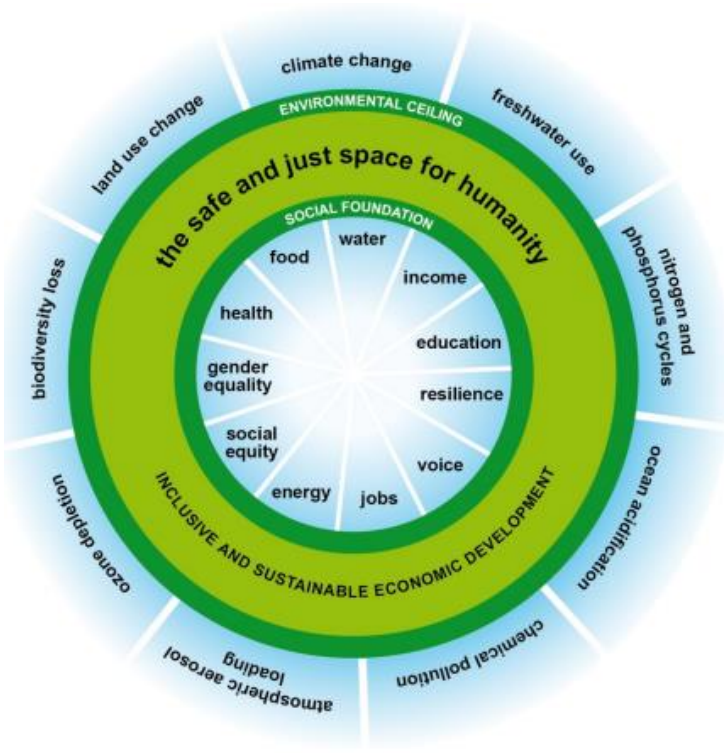


Figure 2 the nine dimensions of the environmental ceiling are based on the planetary boundaries set out by Rockström et al (2009b) Source: Oxfam. The 11 dimensions of the social foundation are illustrative and are based on governments' priorities

2.3 Conceptualising Sustainable Development; a review of the literature

2.3.1 Defining Sustainable Development

In defining and interpreting what is meant by SD, one can easily deduce that this means many different things to a whole raft of academics, policymakers, the business community, and so on. However, one similarity in the thought process is recognising the medium-to-long-term consequences of our actions over the immediate short term. Initially, one can also be led to the conclusion that SD is an oxymoron in a sense; how can businesses, organisations and nations maintain their growth? That is where the sustainability element of the term takes precedence and grounds development in a way that takes into consideration environmental and societal needs.

It is important that we make serious attempts to ensure that the way in which we produce and distribute our products, conduct our business, and offer services is durable and fit-for-purpose now and in the future. Additionally, we must also accept the realities of modern businesses, the recent performance of the global economy, and the societies that exist symbiotically within the economy and environment.

As a way of conducting business, managing our environment, and catering for the needs of our society, SD is a philosophy which speaks to legitimacy theory in the sense that it is "*the generalised perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions*" (Suchman, 1995, p. 574; as cited in: Tilling, 2004). SD is more than just an 'idea' that is a 'good' thing for us to do for the environment and society; it is a philosophy of how we view the world.

To be clear, SD is the viewpoint that our human endeavours should ideally be striving to create a state of global equilibrium, or net positive contribution (Meadows, Randers, & Meadows, 2004) where we recognise that the unbridled pursuit of economic growth must be grounded by the environmental capacity to sustain it, whilst also recognising societal needs; "*Sustainable development, therefore, is the process through which sustainability is achieved*" (Jollands, Akroyd, & Sawabe, 2015, p. 3). However, this definition needs to be expanded to the 'development' in question. Whose definition of SD are we using as academics? Which matrix and measurement system(s) are the pre-requisite to achieving SD? These are far-reaching and also fundamental questions, especially given the interdisciplinary nature of the SD agenda, and the commonplace usage of the term (including the colloquial use of the term by using the word 'sustainability').

In contemporary sustainability thinking, the former Prime Minister of Norway, G.H. Brundtland, who chaired the first UN General Assembly (38/161) which comprehensively investigated critical environment and development challenges, brought these issues into the international spotlight (Langhelle, 1999).

Brundtland defines SD as "*development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs*" (Brundtland et al., 1987). The Brundtland definition of SD is well established in the scholarly discourse and is considered established, albeit as a baseline upon which to develop a more conceptual definition. Brundtland's definition implies that there are necessary limits on the ability of the biosphere to absorb the effects of human activities and has some affinity (or correspondence) with *Small is Beautiful: A study of Economics as if People Mattered* by E.F. Schumacher (Schumacher, 1973).

Schumacher's rationale, that the modern economy is unsustainable, and that diminishing forms of natural capital, such as fossil fuels, are treated as income rather than (renewable) capital, is as relevant as ever in the 2010s. Schumacher goes on to argue that governments must play their part in SD in order to prevent social and economic breakdown as a result of environmental catastrophes.

There is already a body of literature covering the implications of such breakdowns, for example, in 2015 the Middle East saw the stirrings of climate change related refugees as a result of fluctuating rainfalls and increasing average temperatures in Syria, worsening the already conflict-ridden area, by inducing a drought, thereby severely impacting on agricultural production and livelihoods (Brzoska & Fröhlich, 2015, p. 6; Kelley, Mohtadi, Cane, Seager, & Kushnir, 2015). In this example, where an almost complete economic and social collapse had occurred in much of Syria, those who have remained in rural farming areas who relied upon their agricultural produce for subsistence, and also to supply internal markets, felt the impact of climate change. Of course, geopolitical conflicts are an extremely complex discussion point, however, this literature alone underscores the importance of the problems that are present or the justification for adopting a SD agenda.

Since Brundtland raised such pressing issues the United Nations Conference on Environment and Development (UNCED) has met many times for example; *Agenda 21*, at the Rio Earth Summit in 1992, and the subsequent *Rio +5* (1997), *+10* (2002), *+20* (2012), 2015 each updating and reaffirming the need for SD action. However, the outcomes of previous Conference of Parties (COP) meetings have varying degrees of success.

With the Kyoto protocol, in addition to Agenda 21, there have been numerous United Nations Framework Convention on Climate Change (UNFCCC) conferences, summits, and meetings, that highlight progress and action plans of these issues, for example *COP 15 in Copenhagen* (UNFCCC, 2010), and more recently *COP 20 in Lima* (UNFCCC, 2015), although such meetings have occurred every year since 1995.

Furthermore, in December 2015 UNFCCC COP 21 met in Paris to sign the Paris Agreement which "*provide[s] a signal to governments and markets that the world is committed to building a low-carbon future by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels*" (UN-News-Centre, 2015). This aims to achieve credible climate financing and new agreements for measuring, monitoring and reporting progress, thus reaffirming this topical and important issue.

Returning to, *Our Common Future (Brundtland et al., 1987)*, this substantiates the earlier scholarly views of Schumacher in proclaiming that "*Humanity has the ability to make development sustainable*". However, if this is the case, why is it that over 25 years later these issues still persist? If humanity has the ability, why has the gap between the perceived attitudes of the international community towards SD and actual behaviour change not been closed? To a degree, the current 'business-as-usual' approach to the problems we face as a planet persist, it is apparent that change is not something that businesses and successive governments are willing to embrace in order to truly commit to this issue.

Therefore this leads us to recognise that perhaps different businesses, organisations and nations have multiple interpretations of what is meant by SD. Notions of weak vs strong sustainability may offer some insight into the position we are in (Dietz & Neumayer, 2007). On the one hand, a strong sustainability vision situates the environmental considerations, particularly maintaining healthy ecosystems and the services they provide as a prerequisite for our development, similar to the notions of *limits to growth and planetary boundaries framework,* where we recognise the consequence of our actions. Conversely, there are those actors who give precedence to socio-technical solutions to the challenges we face, with an adherence to maintaining our current development trends, thereby demonstrating a weak sustainability vision. By adopting this viewpoint, resources are used in optimal ways, rather than a strict view of them being depleting natural capital, with a view of maintaining or increasing the human socio-economic development in the future (Mancebo, 2015).

Where the UN has played its role in raising consciousness on these issues, it is clear that the individual nature of a free market economy means that, besides regulation or pressures from citizens and customers, businesses and governments can to a degree exhibit either a weak or strong sustainability vision.

2.3.1.1 United Nations Sustainable Development Goals

Building on the initial United Nations millennium development goals, which set out key areas of SD goals between 2000 and 2015 (UN, 2015), whose results probably will not be fully quantifiable long after 2015 (Oestergaard, Alkema, & Lawn, 2013), the UN has developed a new agenda up to 2030 with the United Nations Sustainable Development Goals (UNSDGs) as shown by Figure 3.

Figure 3 United Nations Sustainable Development Goals (Source: http://www.un.org/sustainabledevelopment/sustainable-development-goals/)

The UNSDGs have been designed to take a holistic viewpoint of SD, and as a result solving any one of them will be a complex undertaking. Some definitions are open to a degree of ambiguity, and heterogeneous depending on which country they are implicated within. The UNSDGs are somewhat idealist in their goals, and are rather ambitious, however they are an incipient attempt at a planet-wide agenda that is adopted by 190 sovereign states, with the exception of some disputed territories such as Palestine and Kosovo, island territories under administration from other nation states (such as Pitcairn Island in the Pacific for example which is a British Overseas Territory), and areas almost uninhabited such as Greenland and Antarctica.

2.3.2 Theoretical underpinnings of Sustainable Development

The theoretical underpinnings of SD are well established in the academic literature and are broken down into three distinct dimensions of vulnerability; social, economic, and the environmental. Scholars go further than these basic dimensions, such as AtKisson's VISIS Model (AtKisson & Hatcher, 2001) adopting 'wellbeing' as a dimension in SD, however, for now, this section will focus on the three listed. There are several theoretical frameworks that provide us with the fundamental structure of SD thinking in the social science based literature. Typically, they are grounded on the environmental, social and economic dimensions and help to build the narrative of what we mean when we talk about SD.

2.3.2.1 Triple Bottom Line

Triple bottom line concept of examining the dimensions of SD.; whereby Social (people), environment (planet) and economic considerations (profit) in an equal weighting where possible. It is commonly associated with developments made by Elkington (1997). SD can be conceptualised as occurring at the intersection of TBL, whereby overlapping rings serve to conceptualise the economic dimensions, as shown in Figure 4.

Figure 4 Triple Bottom Line concept (Source: http://tata.com/article/inside/Sustainability-demystified)

With the current business-as-usual approach, the economic stability, and ultimate growth is prioritised over the social and environmental dimensions, therefore environmental stewardship and social enterprise initiatives that lead to social equality take lower levels of priority, and often degradation as a result of this imbalance. This can be visually represented by conceptualising a 'pig-headed' shaped adaptation of Elkington's TBL concept whereby the 'profit' circle is much larger than the 'people' and 'planet'.

2.3.2.2 AtKisson VISIS Model

When defining and articulating what SD means, it is easy to assume that many readers are aware of the challenges prompting the need for change. However, AtKisson's SD framework VISIS (Vision, Indicators, Systems, Innovations, and Strategy) provides a holistic way of conceptualising SD thinking and serves as a dual role as a decision making tool. The VISIS framework starts with indicating a clear vision in terms of development. This stage of the framework encourages decision makers to be explicit in outlining their overall outcome when addressing SD related problems. When this is achieved, the SD thinking and problem-solving section of the framework comes into its own.

Researchers have paid specific attention to understanding the indicators (specifically in the food sector); assessing trends and impacts (such as Bernard et al., 2014; Hřebíček, Popelka, Štencl, & Trenz, 2013). An example of an indicator (a challenge) within the food sector would be water contamination from pesticides used in agriculture. Indicators are usually the first signs that there is a problem that needs addressing either if the indicator is producing environmental damage, causing the company financial losses, or having a negative impact on the well-being of employees and/or the wider society.

Once the key indicators have been identified, research examining systemic viewpoints of how different indicators act in relation to each other emerges; especially the cause and effect of environmental and social challenges (Campbell & Silvia, 2012, p. 34). Returning to the water contamination example; this indicator causes water treatment facilities to factor in greater purification precautions into their operations in order to remove chemical waste from the water supply, which in turn raises operational costs, thereby ultimately increasing water rents for users both residential and commercial.

The interrelations between indicators can be difficult to quantify and even intangible, sometimes happening over long periods of time, for example, long-term emissions of Greenhouse-Gases (GHGs) contributing to climate change. This speaks to complexity theory in the sense that the world is full of diversity, where millions of decisions interact with each other globally, and it is difficult to ground ideas of indicators and how they interact with each other in a single metaphor or system (E. Innes & Booher, 2000, p. 178). Once indicators are outlined, and a systemic viewpoint is adopted (recognising the inter-relations between the indicators, the causes and effects), researchers and practitioners alike are keen to tackle these challenges by implementing in the right sustainability innovations.

It is considered by some academics as the main driver of innovation and development within business, science and technology (Adams, Jeanrenaud, Bessant, Denyer, & Overy, 2015; Kleindorfer, Singhal, & Wassenhove, 2005; Nidumolu, Prahalad, & Rangaswami, 2009; Porter & Kramer, 2006; Schaltegger & Wagner, 2011).

Sustainability innovations can come in many forms; from energy efficiency measures, ethical procurement and supply chains, to investment in carbon-offsetting initiatives, and education and training for employees. This section of the sustainability narrative is where ingenuity, creativity, problem-solving and collaboration come to the forefront of a business's management and decision making. Research, development and innovation aside, the next question that invariably follows is how do companies implement these changes?

There have been sparse scholarly references to strategy implementation as the final step on the VISIS sustainability framework and this is where leadership, governance, and change management can all come to fruition (Epstein & Rejc Buhovac, 2014). The overall strategy for engaging employees, stakeholders and shareholders, customers, and actors in the entire value chain of a business is an extremely difficult process for many companies.

Precautionary Principle

Scholars have linked the need for theoretical underpinnings of SD in problem and solution context. Although it is difficult to quantify for certain the extent of inaction over the challenges facing our environment, societies and economies, the underlying assumption from SD thinking is clear; the 'precautionary principle' should be applied to our activities on a truly global scale.

Research by Kriebel et al (2001) relates the precautionary principle to environmental management using four steps: take preventive action in the face of uncertainty; shift the burden of proof to the proponents of an activity (i.e. those who contribute to the challenges); explore a wide range of alternatives to possibly harmful actions (such as replacing CFCs with Hydrofluorocarbons (HFCs), although HFCs are still a potent GHG); and increase public participation in decision making (Kriebel et al., 2001). Using such a precautionary principle in the decision-making process by policymakers, business leaders, and beyond, is the type of thinking that is needed to balance nature's books and ultimately our economies and societies in the long term.

2.3.3.3 Sustainable Development critique

The critique of the Sustainable Development agenda is that there is still a level of ambiguity as to what constitutes as development. The oxymoron of 'developing' something 'sustainably' has to be framed in with the question of what are we developing and by whose standards are we measuring this by? At the UN level we have the clearly defined SDGs, however when we view these at a national level, the ideological differences within individual states may approach the SDGs differently.

In a neoliberal free market economy, especially ones in the midst of an economic recovery, the needs of the society and environment are not always placed equally with the economic, hence the 'pig-headed' shaped adaptation of Elkington's TBL concept mentioned in 2.3.2.1. We have been warned of the dangers of climate change in relation to our economies for some time, most notably in the UK with the Stern Review (Stern, 2007) and the Economics of Ecosystem Service and Biodiversity Study (Sukhdev, 2008), yet our economies are still driven by a drive towards increasing GDP annually regardless (Jamieson, 2014). Sustainability is reinforcing the neo-capitalism, so long as it is profitable for the bottom line, then sustainability should be pushed. At a business level there is still a unified message as companies from different nation states adhere to different regulatory and compliance standards, thereby fuelling competition based on factors such as price and neglecting indirect actions of their operational footprint (Hoekstra, 2014). Furthermore, it can be argued that the business community have integrated sustainability to serve their own interests, some going as far as to "greenwash" and exaggerate their sustainability actions (De Vries, 2015).

2.3.3 Sustainable Development in context

We are currently in the midst of a degree of geopolitical uncertainty around the world as introduced during the background chapter of this thesis. Further to this, the United States along with Japan and the Republic of Korea have hostile relations with North Korea, and the Russian Federation is also facing diplomatic tensions with many nations. The United Kingdom is in a fragile position with regards to Brexit, and the EU is in the midst of recovering from the refugee crisis from the fractured North Africa and the Middle East. In South America, the Venezuelan people are facing food shortages, and in South East Asia population and resources access (including sea) may prove to be the start of contentious futures in the region. Economies around the world are struggling in one shape or form to maintain their economic growth rates (if any), especially with the expectation of year-on-year improvements in Gross Domestic Product, which conflicts in part with sustainable development goals suggesting weak sustainability visions.

Many economies have an umbilical connection with fossil fuels and other forms of diminishing natural capital, and some have an over-reliance on regulatory systems; such as the United States, especially before the financial crisis of 2008, and Greece, for example, in the EU. There are some nations that are already feeling the negative effects caused by climate change, such as fluctuating rainfalls and ever-increasing average temperatures. Others, if not the vast majority of nations, are running their economies with a budget deficit and even with many trade agreements in place such as in the EU single market, and a host of regulatory bodies such as the World Trade Organisation, many if not all nations are 'competing' with each other in one guise or another.

2.3.3.1 Challenges facing SMEs in engaging with SD

There are many barriers preventing businesses wishing to implement SD initiatives; from difficult reporting metrics and governmental policies that do not incentivise outcomes, to lack of motivation. This section examines some of the most pertinent challenges with specific reference to small and medium-sized enterprises (SMEs); organisations that employ up to 250 persons and have an annual turnover not exceeding €50m annually as defined by the European Commission (EC) (EC, 2017).

When demonstrating that SD initiatives can help to foster innovation and competitive advantage (e.g. energy efficiency schemes, behaviour change strategies, ethical procurement, and social enterprise initiatives), it is important to recognise that it is not easy to adopt appropriate metrics for measuring the outcomes of such initiatives as there are many measurement systems (J. Wilson, Tyedmers, & Pelot, 2007); for example the Global Reporting Initiative (GRI) (Alonso-Almeida, Llach, & Marimon, 2014; GRI, 2014) and Accounting for Sustainability (Gray, 2010). However, it is noted that there is "*no established consensus regarding the best approach to the design and use of SDI [sustainable development indicator] models*" (J. Wilson et al., 2007, p. 300). Furthermore it is apparent that companies using the traditional 'Triple Bottom Line' concept of sustainability (balancing environmental, social and economic interests of business activities (Elkington, 1994 and; 1997)) actually foster 'business as usual', as certain SDIs such as measuring ecology and ecosystem services can be sidelined, and thereby ignored (Milne & Gray, 2013). In order to prevent this occurring, companies have to use multiple measuring systems involving other metrics such as "ecological footprint, wellbeing assessment, ecosystem health assessment, quality of life and natural resource availability" (Graymore, Sipe, & Rickson, 2008). This generates significant tasks for SMEs, potentially forcing companies to outsource their metrics and measurement systems to a specialist company and, in doing so, incur a financial outgoing for the service provided.

Whilst considering SMEs may typically have limited capital reserves (and possibly limited access to finance), and a lack of additional capacity and 'in-house' knowledge for sustainability reporting, it is easy to appreciate how selecting a suitable metric and measurement system may be a daunting challenge in its own right. Furthermore, some measurement systems are seen to favour larger organisations over SMEs, for example, the International Organization for Standardization (ISO) 26000 on social responsibility.

In a letter to National ISO member bodies from the European Office of Crafts, Trades and Small and Medium-sized Enterprises for Standardisation (NORMAPME), concerning the standard on social responsibility, was the "misleading assumption that large enterprises and SMEs can be treated as a

single stakeholder having the same needs and concerns"*(Gourtsoyannis, 2010)*. Thus highlighting a further difficulty with measurement and metrics systems when applying an SME focus.

Another point worth noting regarding metrics, measurements and sustainability reporting is that it may also be the case that where an SME is situated in the supply chain of several larger companies, each of which may possibly require different metrics for their auditing process (as say a pre-requisite for obtaining contracts) the SME will be faced with competing demands on time and other resources to remedy this issue. Furthermore, SMEs may only operate on a regional level, "*thereby limiting their interest in larger global and national level metrics and measurement systems of sustainable development*" (Graymore et al., 2008, p. 369).

Finally, the impact or outcome of some SD initiatives are extremely difficult to measure and thus account for investment or behaviour change, and thereby justify to shareholders and other stakeholders (including customers) that an initiative was successful. However, an 'easy win' for companies would include sourcing products from more ethical and transparent suppliers such as obtaining Fairtrade raw materials. Procurement via an organisation such as Fairtrade can enable SMEs to have a transparent supply chain where ethical claims can be independently verified and therefore more reliable. Whereas an SME having suppliers who are artisanal, smallholder, and even though family and other informal networks can require complicated metrics and measurement systems that may be difficult to apply. Therefore it will require dedicated marketing in order to increase customer awareness.

A quite separate challenge is that there are few internationally agreed policies that encompass sustainability requirements. Examples such as the GRI apply, however, many companies around the globe do not use it. For SMEs operating and exporting on an intercontinental basis, especially with developing countries and emerging economies (for example in South East Asia, Latin America, and parts of Sub-Saharan Africa) legislative requirements for exports to some sectors will require big investments of time, capacity, and financial resources, not to mention having a quality product/service and a market to enter. Governmental departments such as the United Kingdom Department for International Trade, Chambers of Commerce, and local authorities can assist with knowledge and support to companies. However, the SMEs themselves would need to actively engage with these organisations, or even be aware that they offer such services unless prompted by government.

2.4 Introduction to Conventional Food Networks

The particular context within which this research project is grounded in is the food sector and its relationship with the SD agenda. More specifically, the context we find ourselves in sees agriculture and food production, processing, retail and consumption at a 'crossroads' (IAASTD, 2008). There is a something of a split in the food sector, between large-scale conventional food systems, with retail heavily reliant on supermarkets and chain restaurants, their supply chains (and intermediates), right the way through to the primary producers themselves, who experience 'lock-in' to these systems (Ilbery, Maye, Kneafsey, Jenkins, & Walkley, 2004; Seyfang, 2006). On the other hand what is often described as an 'alternative' or opposition to the 'conventional', which is typically more localised in its geographical reach, smaller scaled, often using agro-ecological growing methods, with an emphasis on quality over quantity, and a concern for the social actors involved (Tregear, 2011).

In their paper on food security and AFNs, Dixon and Richards provides us with a summary of what they term as three food regimes of identifiable worth;

1st Food Regime: "*an early twentieth century era of extensive agriculture producing bulk commodities linked to geopolitical expansion*";

2nd Food Regime: "*a mid-twentieth century industrial, processed food era animated by food surpluses and sociotechnical system developments*";

3rd Food Regime: "*a late twentieth century period of global corporate and supermarketized supply chains highly sensitized to, and manipulative of, citizen-consumer concerns regarding the environment, nutrition, animal welfare and farmer incomes*" (Dixon & Richards, 2015, p. 192).

The three 'food regimes' do to some degree help to contextualise the historical nature of food production, and to an extent, consumption. They do however only apply in the developed economies. Many developing nations for much of the 20th century and into the 21st have large amounts of non-industrialised farming practices as a mainstay of food security and provision, to a degree including subsistence farming (Rigg, 2006). When contextualising our discussions regarding agriculture and food production, we must recognise that territoriality of food is a major concern and that despite our technological and scientific advances, we still live in a somewhat polarised economic world, especially when viewing the global North and South (Kaufman, 2012).

Of course, we must be careful not to generalise and simplify the differences between the two opposing food systems, nor should we pit them against each other as for some instances we see a blend between the two (e.g. in specialist retailers who stock alternative and conventional products) (Goodman et al., 2013).

However, the statements above goes some way in stating the fundamental differences between the two food production systems, and it is important to recognise this early on in this chapter for the sake of clarity. In conventional food networks, producers are very much 'locked-in' to the demands of the processors and retailers of the end product. Intensive production and agricultural methods are used almost exclusively in order to cater for the bulk-buying nature of the suppliers, processors and retailers.

There has been a wide-reaching public and academic interest in the relationship producers have not, only with the retailers, but also with the customers. When it comes to consumers and their engagement with CFNs, the consumer knows what they are getting to an extent; there is a regularity that many consumers are attracted to and with this, there is often brand and purchase loyalty (Chaudhuri & Holbrook, 2001).

In recent years conventional processors and retailers have made attempts to be more transparent with their supply chain and the business practices. Movements such as Fair-trade and the Rainforest Alliance, encourage the consumer to investigate where the food products come from, with the added bonus of having consumer buy-in. These sorts of initiatives are often used as a marketing tool in order to capture consumers who are ethically minded, or just conscious of where their food comes from and its impact on society and environment. The sometimes gloomy and cold description of CFNs would suggest that these organisations are somehow unconcerned with the society which the producers operate in, and indifferent to the concerns of the environmental considerations associated with their actions. However, the corporate enterprises, especially those who process or retail products that come from some of the world's 'troubled' spots, are very keen on promoting a positive public image and showing stewardship for their wider community.

Coffee is a case in point; an example of coffee in Honduras by Kenco is a topical example of where a conventional food company is re-localising its relationship with the producer and is thereby engaging the consumer too. Kenco's social enterprise initiative of the '*Coffee vs Gangs Project*' demonstrates their efforts in supporting a number of young people from urban and rural communities in Honduras in getting into coffee farming (Burn-Callander, 2015).

There is a large concern that many young people in Honduras are coerced into the problematic gangs which plague the country (see figure 5). Kenco have a vested interest in assisting with promoting the next generation of entrepreneurial coffee farmers, by employing such social enterprise initiatives, they are actively taking responsibility for securing the economic wellbeing of their area of commercial interest.

Figure 5 Marketing of Kenco's Coffee Vs Gangs Source: http://coffeevsgangs.telegraph.co.uk/

In this project, students enrolled in their course are taught about the coffee industry, from production, their customers, processing and retailing, along with business skills in order to develop their own farms upon graduation. Whilst this example is specific to Honduras, and not in the UK, the resulting coffee produce is available on UK supermarket shelves, and shows the interconnectivity of global supply chains, and reflects the values of the companies and organisations that are involved in them.

2.5 EU and UK food sector context

Historically, pre-second world war production, supply and distribution, retail and consumption of food and agricultural products in developed economies within Europe would have seldom diverted from very local, seasonal and small-scale methods. Global trade has been an emerging trend since the days of the East India Trading Company. For a long time there have been imports of exotic and cross-cultural produce from all parts of the globe, such as tea, coffee, jute, spices, fruits, and meats. On the whole, however, the main dietary staples and vegetables were often grown and reared nationally.

Between 1939 and mid-way through 1954 the UK experienced rationing in an attempt to make food provisions stretch as a control measure to prevent social and economic collapse and ultimately starvation. During the Second World War and for several years after, Britain was heavily reliant on imported food from the United States and other Allied countries. After this time the UK and other

European nations experienced a shift from public ownership of food production and agriculture, towards an embrace of capitalism and the free market economy.

More than at any other time in the history of our species we have the capability to manipulate our agriculture and food production systems on a truly global scale. With the globalised nature of 21st century food production, distribution, and consumption, this interrelated and also interdependent sector surpasses most, if not all, in being a true anthropogenic planetary system (see IAASTD, 2008).

In many respects the food sector is one of the chief drivers of globalisation as supply chains and logistics for foods (and other products such as biofuel, and raw materials such as fibres) are coordinated and intercontinental, often by large multinational companies (Cooper & Ellram, 1993; Dickens, 2014; EPBRS, 2013). The conventional food sector plays its part in contributing to some of the worst environmental and social challenges facing the planet, ultimately impacting on public health, quality of life, and well-being (Allan, 2004; Berghöfer et al., 2008; Skinner et al., 1997; Stoate et al., 2001).

Agriculture and food production at the primary level is still dependent on labour by people, livestock, and the related ecosystems; therefore when we talk about our food and agriculture it is imperative that we ground the sector within the realities of the current global zeitgeist. For many years academics have supported the need for sustainable and efficient agricultural practices (see Tilman, 1999). Research from Foley et al, for example, offers alternatives to some associated indicators (or challenges) such as by closing 'yield gaps' on underperforming lands, increasing cropping efficiency, shifting diets and reducing waste (Foley et al., 2011), yet challenges still persist as businesses and governments fail to implement sufficient sustainability strategies (Huckle & Wals, 2015; Park, Conca, & Finger, 2008).

Nevertheless, Europe as a continent has a negative food-related indicator of overweightedness and obesity which results in ever increasing nutrition, health and budgetary issues (FAO, 2015a, p. 2). Conversely, the food sector needs to be situated to aid in the mitigation of such indicators and potentially achieve net positive advantages (see Conway & Barbier, 2013; Horrigan, Lawrence, & Walker, 2002; Thrupp, 2000).

2.5.1 The Common Agricultural Policy

In terms of global societal challenges linked to the food sector, the most profound are that “about 795 million people in the world still lack sufficient food for conducting an active and healthy life” (FAO, 2015b, p. 17). While this is the case, as a region Europe, and more specifically members of (but not

limited to) the EU, have achieved the United Nation's Millennium Development Goal (UNMDG) of reducing the proportion of people affected by hunger.

This may be due to the EU's agricultural sector being supported by subsidies and is heavily regulated by the Common Agricultural Policy (CAP) (EU, 2013). The CAP falls into the expenditure budget of 'natural resources' which equates to approximately 43% of total EU expenditure in 2014 (of €142 billion) (EC, 2015). There are a number of EU CAP sub-policies influencing the way local authorities support the food sector, primarily the producers and farmers, in payments and supported prices. For example, the LEADER project, which is part of Pillar 2 of the CAP (5). Currently mainstreamed, designed to spread a more 'bottom-up' processes and in keeping with this mindset, it is the Local Enterprise Partnerships (LEPs) who have the responsibility of facilitating.

2.5.2 EU Policy towards SD

The EU has integrated Corporate Social Responsibility (CSR), an extension of the SD concept, into policy in the business context and has been evident for some time. The European Commission (EC) published its first green paper on CSR in 2001, followed by the establishment of a multi-stakeholder forum in 2001, ultimately publishing the first CSR communication in 2002 (COM, 2002). In the aforementioned communication briefing paper on CSR, the term is defined as; "*a concept whereby companies integrate social and environmental concerns in their business operations and in their interactions with their stakeholders on a voluntary basis"* (COM, 2002, p. 5).

The European multi-stakeholder forum on CSR, held through 2010 and 2011, re-launched the SD agenda by fostering sustainable reporting (for instance the environment and employee matters directive 2003/51/EC) and by also publishing research on corporate governance for sustainability; and the state of play in sustainability reporting in the EU (including global reporting initiative (G3, 4) (Van Wensen, 2011). Furthermore, by the FP7 Capacities Work Programme 2007-2013 and then through the current Horizon 2020 (2014-2020) project.

The EU's *Europe 2020 strategy* outlines "*a strategy for smart, sustainable and inclusive growth*" (COM, 2010). The strategy gives reference to SD as 'sustainable growth' which is defined as promoting a more resource efficient, 'greener' and more competitive economy. The strategy states that "*such an approach* [sustainable growth] *will help the EU to prosper in a low-carbon, resource constrained world while preventing environmental degradation, biodiversity loss and unsustainable use of resources. It will also underpin economic, social and territorial cohesion*." (COM, 2010, p. 14).

An example of this strategy in practice comes from the flagship initiative '*Resource Efficient Europe'* (COM, 2011) that aims "*to support the shift towards a resource efficient and low-carbon economy that is efficient in the way it uses all resources*" (COM, 2011, p. 15) and is just one of seven flagship initiatives aimed at delivering the EU's sustainable growth strategy.

The European Platform for Biodiversity Research Strategy expresses a need for more integrated and trans-disciplinary approaches to generate the knowledge necessary to bring human societies into a sustainable and mutually beneficial relationship with the living world (EPBRS, 2010). Furthermore, there is a call to:

> *"[4.2] Better understand the human behavioural patterns and decision-making process in relation to biodiversity use and conservation, with the aim of promoting a more sustainable lifestyle. Better understand how choices are made (from individuals and business to government policies) and how our choices in turn impact on biodiversity and ecosystem services in the EU and globally. In this respect, we need to understand what motivates people in their decision-making, their perceptions of risks and benefits when making choices, the possible trade-offs inherent in their choices, and the trans-generational implications of those choices" (EPBRS, 2013, p. 6)*

In addition to this, there are scholarly articles calling for more SD related research for SMEs. For example, research into environmental leadership and consciousness development (Canadian SMEs) expresses the need: "*future research on environmental leadership in SMEs from various countries could shed light on different values, visions and abilities*" (Boiral, Baron, & Gunnlaugson, 2014, p. 328). Additionally, there is support for further research into collaborative relationships which may provide opportunities for SMEs to overcome some of the barriers to adopting sustainable business practices (Lewis, Cassells, & Roxas, 2014).

2.5.3 Brexit and what this might mean for the UK and its food sector

As indicated in section 1.2.3 in Chapter 1, when the UK withdraws from the EU in 2019, as is currently forecast, in essence, the top level of funding which comes from the EU, primarily from the European Structural and Investment Fund, to the various departments in the UK government will effectively be removed (see figure 7). As a result, the UK government will have to decide how it will best reallocate resources to these individual departments. Figure 7 shows a graphical depiction of the network between the EU level agencies, and the UK government and its various departments which link with the food sector. The figure is directed, the arrows show where resources go to in terms of financial and human resources. The "AFN" label indicates the position of AFNs within this network.

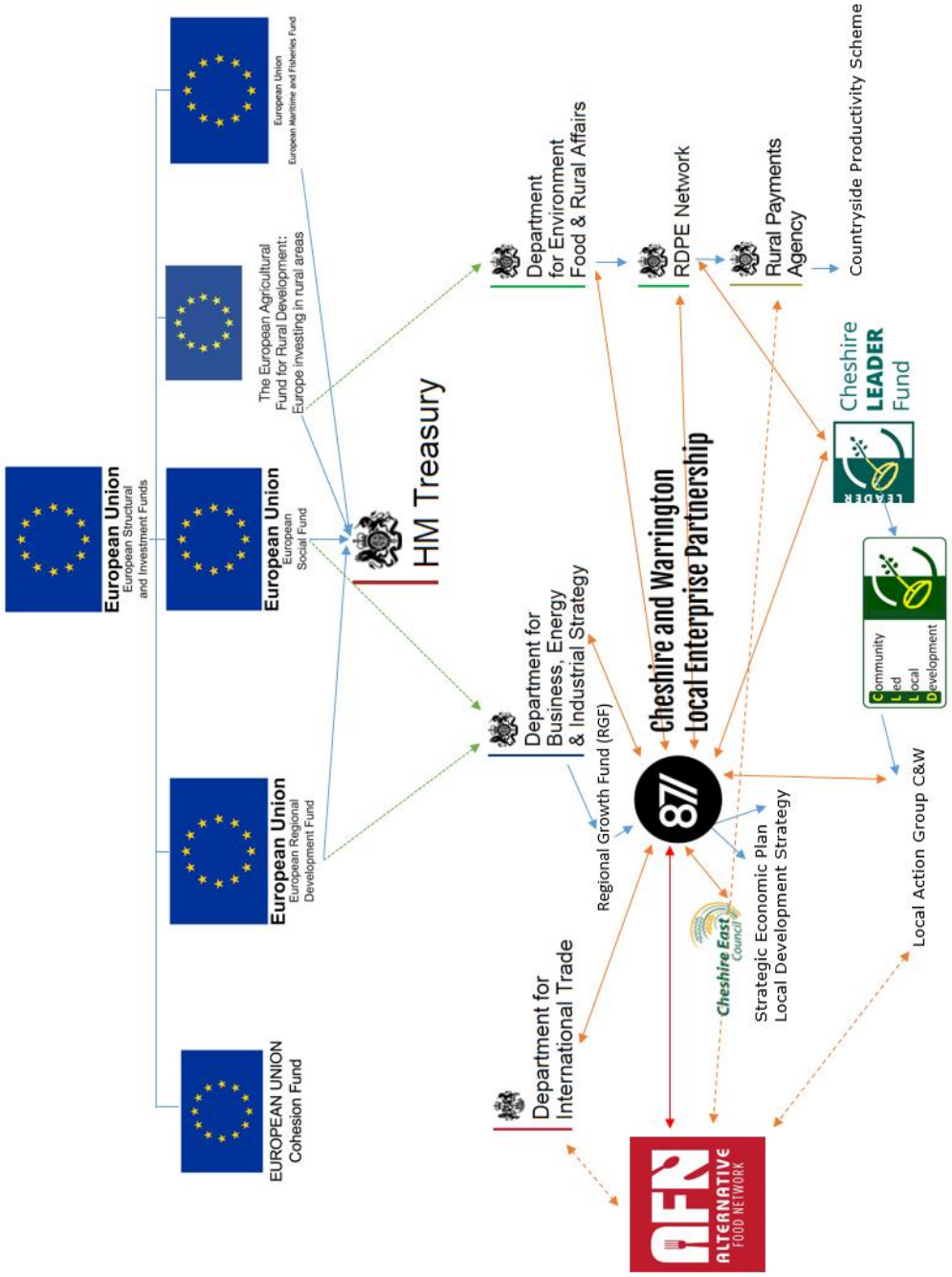


Figure 6 EU and UK funding for Local Enterprise Partnership (Author's own figure)

2.6 Chapter conclusions

The chapter started by introducing the global indicators and challenges that justify the need to change 'business as usual' when it comes to the way we interact with the environment, chiefly by citing the planetary Boundaries Framework. On the basis of the scientific consensus on the challenges facing our planet as a whole, we can appreciate the seriousness of the situation when it comes to understanding the major indicators. SD has been conceptualised through defining of the term itself, along with examples of global action from the United Nations. The theoretical underpinnings of the SD agenda have been covered, including TBL, and the AtKisson VISIS model has helped understand a decision-making tool when approaching sustainability matters.

The chapter covered an account of what is meant by CFNs through discussing various points of their supply chain in a critical manner. The example of the social enterprise initiative in Honduras by Kenco serves as a reminder of the global aspects of supply chains and recognises that CFNs play their part in SD efforts. The chapter then presented an outline of EU and UK food sector, covering the CAP, EU policy towards SD, and Brexit and what it might mean for the UK from a budget restructuring perspective.

The thesis is now better informed as to the reasons why sustainable food production needs to be considered in any attempt to redress some of the social and environmental challenges as outlined in the planetary boundaries framework. The UK is currently undergoing a transitional period whereby it will have to redress the way in which it allocates funds to its governmental departments and thereby local authorities and ultimately businesses and organisations. This presents an ideal opportunity for AFN to become a focal thought of this potential reallocation of resources, as the UK may well seek to develop its own food sector with SD principles in mind to support growth in its economy.

As AFN have been briefly outlined and discussed in passing throughout the first two chapters of this thesis, it is now appropriate given the background context, to explore the scholarly discourse and theoretical underpinnings of AFNs in detail.

Chapter 3. Literature Review. Alternative Food Networks: an evolving theoretical landscape

"Science moves, but slowly slowly, creeping on from point to point".

Lord, Alfred Tennyson
Locksley Hall (1835)

3.1 Chapter introduction

The purpose of this chapter is to review the relevant literature on the AFN in order to provide this thesis with its theoretical underpinnings. This is an essential stage of the research as it informs the appropriate methodological positions, and designs undertaken, and focuses the data collection phase and subsequent findings and conclusions of this thesis.

3.1.1 Objectives of the chapter

To reiterate, the primary research question for this thesis is:

1. To greater understand contemporary debates surrounding alternative food networks in an online and offline setting.

As outlined in Chapter 1, the literature review is concerned with achieving objective 1;

Contextualise the need for the research by critically examining the literature concerning alternative food networks in developed economies.

In order to achieve this, the following specific objectives are set for the review:

- Assess the theoretical underpinnings of AFN debates in the academic literature area;
- Understand the research trends surrounding the notion of AFNs;
- Identify gaps in our understanding of previous research on AFNs and outline opportunities for further research;
- To critically analyse the issues/ theories associated with AFNs.

The three chapter specific objectives were selected in order to give scope for the research and ensure that the literature review narrative had sufficient purpose and focus. By understanding the research trends and theoretical underpinnings of AFNs, this research will be well placed to potentially contribute to the scholarly discourse on this topic area. However, in order to ensure that the contribution is contemporary and of value, there will, of course, be a need to investigate which gaps in knowledge are identified by the literature directly, or inadvertently.

3.1.2 Structure of the chapter

The chapter starts by outlining the literature review protocol. This includes a description of the methodology that has been used in order to conduct the review itself. The literature review methodology covers a definition of the review types that have been selected over other options, including the defined scope of the research, and how the literature will be searched, analysed and synthesised.

The chapter is then concerned with the review itself; a systematic review of the published literature on AFNs from peer-reviewed journals and other grey sources that were pertinent and of value (such as governmental reports), in order to establish the theoretical concepts on which this research is grounded. The two centralised theoretical underpinnings of AFNs that were evident in the literature review were; Conventions Theory and Embeddedness.

The chapter finishes with a description of the highlighted gaps in knowledge and a summary of concluding thoughts on the state of knowledge on AFNs.

3.2 Literature Review Protocol

The literature review is a "*specific and reproducible method used to identify, select, and appraise all the studies of a previously agreed level of quality that are relevant to a particular question. The results are then analysed and summarised*" (Booth, Papaioannou, & Sutton, 2011, p. 3). In practical terms, researchers conduct a literature review as it helps to acquire an understanding of the research topic, of what has been already researched, how it has been researched, and what the key issues are (Hart, 1998). The review should also critically evaluate the literature within the selected research area with the "*aim of underpinning and justifying research questions*" (Finn, 2005, p. 90). Furthermore, the researcher is made aware of the pertinent theories, their development, and application, as well as the shortcomings and criticisms.

Amongst some academics, it is suggested that there is an uptake in accurately recording search processes (Rader, Mann, Stansfield, Cooper, & Sampson, 2014). Furthermore, there appears to be a "*call for more rigour in documenting the literature search process and to present guidelines for crafting a literature review and search*" (Vom Brocke et al., 2009, p. 3). Therefore the researcher was keen to incorporate documenting of the literature search from an early stage of this thesis.

3.2.1 Search strategy and study selection criteria

The scope of the literature review is primarily an exercise in the development an understanding of the pertinent literature on a given topic area. Firstly, this involves defining the inclusion criteria when searching the literature i.e. the 'who', 'what', and 'how' (Booth et al., 2011). With the aid of online databases, there is a rich plethora of literature available to the researcher. For example, with a quick 'Google Scholar' search, typically within under a second, a researcher can have results in the millions. In cases like this, the researcher is presented with more than enough material to begin information-seeking which can be defined as 'information overload'. This "*occurs when we are overwhelmed by the volume of information that we are facing and are therefore unable to retrieve the information we need*" (Booth et al., 2011, p. 6). Therefore it is important to apply information literacy skills in order to make information processing tasks more efficient (B. Johnston & Webber, 2003). According to Lloyd (2006), the information literate researcher is defined as having "*the ability to know what there is in a landscape and to draw meaning from this through engagement and experience with information*" (p. 570). In order to align with information literacy, the SPIDER tool (**S**ample, **P**henomenon of **I**nterest, **D**esign, **E**valuation, **R**esearch type) is used as a structural framework, which was devised by Cooke, Smith, and Booth (2012).

The SPIDER tool is designed specifically for qualitative research projects, and is an alternative search strategy to the more quantitative, empirical based PICOC (**P**opulation, **I**ntervention/exposure, **C**omparison, **O**utcomes, **C**ontext) (da Silva, Costa, & Prikladinicki, 2010; Schardt, Adams, Owens, Keitz, & Fontelo, 2007). The SPIDER tool is used for each of the research questions in order to construct a generic inclusion criteria (see Table 1).

The study selection criteria help to ensure that the selected articles have a link to the research questions and do not deviate into other topic areas. The review itself is confined to AFNs and companies who operate within them. Research with samples of SMEs and those who are operating within the EU is also included. Studies outside the EU will be included if they are focusing on similarly developed economies (such as, but not limited to, the USA, Canada, Australia, and New Zealand). However, where pertinent studies with samples outside of the EU are used, a justification for inclusion is presented. Of particular interest will also be perceptions of actors who are decision makers within their own right, such as Managing Directors (MDs) or owners of companies, policymakers, growers and farmers, and producers of food and drink.

The phenomenon of interest in question of course is the AFNs. However the search will be extended to consider the wider aspects of the SD agenda, for example, ethics, values, perceptions, influences and pressures of actors involved. The various synonyms used for AFNs and SD will also be factored into the inclusion criteria. The review includes studies from an Interpretivist (qualitative), Positivist (quantitative) and mixed-method approaches.

Table 1 Inclusion Criteria for SPIDER search

SPIDER tool	Inclusion Criteria
Samples to include	• Companies within the food industry (small and medium-sized companies); • Alternative Food Networks (within the EU, yet not limiting any comparable economic areas such as North America); • Decision makers (MDs, owners, policy makers, farmers, growers, producers).
Phenomenon of Interest	• Alternative Food Networks (extending to its supply chains; small-scale, local, production, distribution, intermediates and retailers); • The Sustainable Development agenda (extending to CSR, sustainability, philanthropy, ethical and responsible business); • Attitudes and values of AFN actors (ethics, values, pressures, influences).
Research Design (Methods, Epistemology)	• Case studies (of companies, and Alternative Food Networks); • Interview-Based (with decision makers); • Questionnaire Survey (using various AFN actor synonyms; policy makers and consumers); • Focus groups (same as above);
Evaluation	• Role of AFNs as a competitor to CFNs (including hybridity where the two interrelate) • Implications of Sustainable Development (drivers and barriers, costs and benefits, relationship between innovation and competitive advantage); • Attitudes and values of AFN actors (ethics, values, pressures, influences).
Research type (Research Strategy methods, Ontology)	• Interpretivist (qualitative research design methods); • Positivist (quantitative research design methods); • Mixed methods (both qualitative and quantitative research design methods).

3.2.1.1 Search Terms

Search terms are generated directly by using the search strategy tool SPIDER, exploring possible synonyms, and finally by using the conjunctions ‘and’ and ‘or’ in searches. The inclusion search terms are presented in Table 2.

Table 2 Search Terms in relation to the SD agenda and AFNs

SPIDER tool	Search Terms for RQ1. Search Terms in relation to the SD agenda and AFNs
Samples to include (context and actors within)	"Alternative Food Networks" **Synonyms**: "AFN", "EU", "UK", "small and medium-sized enterprises", "food industry", "SMEs", "systems", "local and short supply chains", "local food". "Actors" **Synonyms**: "decision makers", "owners", "policymakers", "farmers" "managers", "leaders", "customers", "consumers", "managers", "grower", "supplier", "distributors", "intermediates".
Phenomenon of Interest (concept and who this applies to)	"Alternative Food Network" **Synonyms:** "Alternative Food Systems", "agri-foods", agrofoods", "sustainable food systems", sustainable agriculture", "short food supply chains", "local produce". "Sustainable Development" **Synonyms**: "sustainability", "corporate social responsibility", "CSR", "ethical business", "responsible business", "sustainable business", "philanthropy", "social enterprise initiatives", social enterprise", "environmentally friendly", "green", "environmentally conscious". "Attitudes and perceptions" **Synonyms:** "motives", "choices", "feelings", "ethics", "values", "pressures", "influences", "managing", "controlling", "perceptions", "decisions", "views"
Research Design (Methods, Epistemology)	"case studies", "interviews", "questionnaire", "survey", "focus groups", "action research".
Evaluation (of concept and actors)	"role" [of] "Alternative Food Networks" (see synonyms) **Synonyms**: "purpose", "barriers", "benefits", "challenges", "implications", "result", "innovation", "improvement", "competitive", "limitations", "Attitudes" [of actors] **Synonyms**: "perceptions", "approach", "opinions", "views", "feelings".
Research type	"Qualitative", "Quantitative", "Mixed Methods"

3.2.1.2 Resources to be searched

Electronic databases

When searching for journal articles, there are a number of search engines and databases that can be used, for example, *Science Direct; Google Scholar; JSTOR; and University library databases*. There are many others, including those who specialise in individual academic disciplines such as GeoRef which is a collection of geoscience literature.

Other search methods

A study published in the Online Information Review found how there is a "*growing reliance of scientists on general search engines, particularly Google, for finding scholarly articles*"(Jamali & Asadi, 2010, p. 282). This being said, it is important not to neglect paper-based sources of literature such as topic textbooks and study guides. One clear benefit of some paper-based sources is the synthesis and summary of some of the major debates within the body of knowledge that they provide. This is sometimes helpful in the early stages of gathering sufficient knowledge on a subject, whereas journal articles sometimes signpost this knowledge to other references thereby creating more work for the researcher.

3.2.2 Study quality assessment checklists and procedures

When gathering quality journal articles, a prerequisite to this 'quality' arguably has to be the peer-reviewed system of publication. Peer-reviewed journal articles (and university level textbooks) offer the reader a level of 'quality control' such that the process theoretically removes substandard research from being published, for example, those who have plagiarised, or included little if any references. In *The Role of Peer Review for Scholarly Journals in the Information Age* (Solomon, 2007) the article discusses the "*recent innovations in how peer review is conducted in light of the various functions journals fulfil in scholarly communities"* and expands on this issue further. Finally, *The ethics of scholarly peer review: a review of the literature*, by Souder (2011) discusses more issues of the peer-reviewed process including: bias, courtesy, conflict of interest, redundant publication, honesty, transparency, and training.

When the peer-reviewed process is single-blind, double-blind, triple-blind, sometimes more, theoretically there are attempts to eliminate of gender, socio-cultural, reputation factors, and biases (Fisher, Friedman, & Strauss, 1994; Van Rooyen, Godlee, Evans, Smith, & Black, 1999).

Furthermore, a randomised experiment at *The American Economic Review* indicated "*the effects of double-blind versus single-blind peer reviewing on acceptance rates and referee ratings indicate that acceptance rates are lower and referees are more critical when the reviewer is unaware of the author's identity*" (Blank, 1991). Hence, it may be the case that when double-blind peer review is implemented more scrutiny and scepticism is employed, thereby making the article itself more reliable and useful.

A further issue of 'quality' that has been researched is that there are instances where 'ghost authors' and 'honorary authors' are prevalent in some publications. For example where a co-author(s) have not sufficiently met the standards of authorship, such as those outlined by the American Psychological Association's (APA) manual (American Psychological Association, 2011). An examination of 809 medical journals concluded that "*a substantial proportion of articles in peer-reviewed medical journals demonstrate evidence of honorary authors or ghost authors*" (Flanagin et al., 1998). Whilst recognising that this study was conducted some time ago, and in the health sciences, it is, however, worth being conscious that honorary and ghost authors may undermine the perceived validity of the journal article as it gives the reader the impression that an author, who may be regarded as an authority or expert on a given subject, has contributed to an article when in fact they have not. Of course, this does not necessarily affect the quality of the research. Although the example above was situated in the health sciences, and this research project is not; it is important to be conscious that this phenomenon occurs and may be transferable to other disciplines, especially as this research project will be trans-disciplinary in its secondary data collection.

Given the time constraints and the fact that this research project has just one researcher, little can be done to follow up on this issue in any depth. However, as the body of knowledge is thoroughly reviewed, it may become more apparent who are the main contributors to this research area, and who is contributing by other means. This can be achieved by using citation databases. An effective way to investigate citations can be to use a database such as the *Web of Science*; "*The Web of Science Service for UK Education provides a single route of access to Thomson Reuters's products subscribed to by an individual institution" (http://wok.mimas.ac.uk/about/).* A citation map can be generated as a visual aid and an initial indicator to see who is referencing who. The researcher can become familiar with which authors are contributing, however, it should not be seen as a substitute for conventional literature gathering, rather as an aid. The following step would be to take note of the authors and examine their publications to see if they contribute to the body of knowledge, to consider in which ways they contribute, and then repeat the process if deemed necessary.

In addition to the article, the quality of the journal must also be examined. Databases such as *SCImago Journal Rank, Journal Citation Reports* (Thomson Routers) and, *Eigenfactor* are reputable. Furthermore, the *Academic Database Assessment Tool* (ADAT) can be used in order to generate a list of journal articles based on search criteria, the simplest being a 'keyword search', as discussed above.

When to stop

The review of the literature on AFNs was concluded when sufficient contextual and conceptual information was acquired as judged by the author of this thesis. That is when the review accurately and succinctly summarised the main body of peer-reviewed publications on this topic area.

Scope Creep

Saunders et al remind us to be aware of going too far off course when we are reviewing the literature (Saunders, 2012). In order to prevent this happening, the control measure of note-taking and referencing sub-issues of an article in a separate word document helps to keep track of seemingly subsidiary issues. Once the review was completed, this list was reassessed to see if there were any pertinent issues noted.

3.2.3 Data extraction strategy

After completing a systematic literature search using the search strategy listed above, all the PDF files of the journal articles selected were imported into NVivo 11 pro for windows. This software package enables the researcher to read through each individual document and highlight selected text, and then code into specific themes and issues (Di Gregorio, 2000). For example, if a specific section of text referred to an issue relating to environmental considerations, this would be categorised as a 'parent node'. With NVivo 11 the researcher can further sub-categorise for a particular consideration, For example, an environmental consideration, specifically relating to water quality, can be categorised as a 'child node', and attached to the 'parent node'. This then allows the researcher to draw out recurring themes within the literature, as well as understanding the literature in detail as each document is read.

3.2.4 Synthesis of the extracted evidence

It is argued by some scholars that using such a tool as NVivo 11 for synthesising literature offers a degree of transparency (Houghton et al., 2017). This is because "*the query tools within NVivo can facilitate sensitivity analysis to check the impact of the findings from reports deemed of a lesser quality*" (Houghton et al., 2017, p. 873). Therefore, in order to maintain this transparency, and for its asserted benefits, the analysis and synthesis of the literature review was conducted using NVivo 11 software.

3.2.5 Journals Reviewed

Whilst conducting the literature review, a summary of each article reviewed was collated and presented in the form of a large table in order to aid the structure of the review itself. A complete list of journals reviewed, along with thematic and theoretical topics, is presented in Appendix 1. This appendix serves to highlight the degree of complexity that was present in the literature and serves as a sound reference point when referring back to the main points discussed in the literature. Appendix 1 shows the relationship between Alternative Food Network and Sustainable Development related thematic areas that have commonality between the two concepts.

3.3 Conceptualising Alternative Food Networks

The key purpose of this section lies in reviewing the academic literature on the topic of AFNs in order to gain critical insights into the understanding of what qualifies as an AFN from a practical and theoretical perspective. This section starts with explaining and defining the concept of AFNs and how the literature has evolved since the late 1990s, and establishing what we mean when we refer to AFNs in a scholarly setting. The section then critically examines the theoretical perspectives present in the literature. Finally, there is a summary of the key debates within AFN literature and an indication of where this review leaves the thesis in relation to the methodology chapter.

Choice of language

O'Kane raises a very valid point when stating that "*decisions around choice of language in food system literature can be problematic*" (O'Kane & Wijaya, 2015, p. 1125). It is all too often the case that academic literature on this subject interchanges its choice of words when referring to a phenomenon; for example, 'alternative food network' and 'alternative food system' is a distinction that is not always explicitly defined and explained. O'Kane conducts a thorough narrative explaining that *"we use 'network' most frequently, as it more clearly denotes the shorter and perhaps more dynamic food supply chain that typifies farmers' markets and farm shops*" (Renting, Marsden and Bnaks 2003; Kneafsey 2010 as cited in O'Kane & Wijaya, 2015, p. 1126).

As networks relate directly to the theoretical underpinnings of AFNs and for the sake of clarity and consistency, this study will continue to use the term 'network' rather than a 'system', and also extend this clarity to 'conventional food networks'.

3.3.1 AFNs, an evolving concept

Since the late 1990s, there has been a growing body of research that has focused on conceptualising what we mean by the term 'alternative' in relation to food provisioning. Maye and Kirwan list: "*sociology, human geography, anthropology and agri-food studies more generally*" (2010, p. 1), as the main body of social science-based topic areas. The broad range of topic areas in a variety of academic disciplines focus on themes such as cultural, political, societal, and management studies, and will, of course, all have focal areas of theory and approach this topic differently. Given the multifaceted nature of AFNs, it is easy to understand why different academic disciplines will pay more attention to one aspect of an AFN than another, thereby leading to ambiguity as to where the focus of this topic is. Furthermore, it is not uncommon to see a scholarly narrative used to describe and explain a specific term of reference; therefore we see a degree of ambiguity when trying to understand what we mean when we mention AFNs. However, what is clear from academic literature on AFNs is there are a set of theoretical underpinnings which link with the SD principles.

Early attempts at conceptualising the term 'AFNs' sought to draw upon more traditional representations of geographies of food and were more concerned with reporting accounts of AFN in relation to a changing global relationship with food from a SD standpoint. For example, an early account of AFNs mentioned in the food geographies literature was made by Whatmore and Thorne in a chapter exploring the roots of the 'Fair Trade' initiative, drawing upon the movement values as a whole, and stating that their exemplar of fair trade coffee:

"*Serves to illustrate how alternative geographies of food lengthen their reach using many of the same actants and spaces as their commercial counterparts. What is analytically distinctive, however, is how they strengthen relationships amongst formerly "passive" actants in commercial networks – the producers and consumers – through a mode of ordering of connectivity which works for non-hierarchical relationships framed by 'fairness' "* (Whatmore & Thorne, 1997, p. 246).

Another attempt at defining what is meant by the term AFN comes from Renting et al who states that AFN is; "A broad embracing term to cover newly emerging networks of producers, consumers, and other actors that embody alternatives to the more standardised industrial mode of food supply" (2003, p. 394). Tregear provides us with a general definition of AFNs as "forms of food provisioning with characteristics deemed to be different from, perhaps counteractive to, mainstream modes which dominate in developed countries" (2011). Adding to this; at the most elementary level of an AFN,

there is an inherent desire for a reconnection between all members of a food network, (Ilbery, Morris, Buller, Maye, & Kneafsey, 2005 as cited in Albrecht & Ohberg 2013; Renting et al., 2003).
On visualising what is meant by reconnection, Dowler, Kneafsey, Cox & Holloway help describe this notion in AFNs by stating in their conclusions; "growers, rearers, processors, customers, members, consumers – whatever the label – discovered and reinforced feelings of pleasure in and awareness of the sensuality of food (look, smell, texture, taste), and of the importance of knowing provenance in terms of place and people" (2009, p. 216).

This may be the case, however, the way in which this reconnection occurs may differ depending on the specific type of food network. The networks may be heterogeneous and complex, and not so easily defined or explained. Table 3 presents a synthesis of commonly referred to binary phrases mentioned and referenced by others in the AFN literature:

Alternative food regime binaries 1990s to the present

Conventional dominant terms	**Alternative sub-ordinate terms**
Modern/Rationalised	Postmodern/ Traditional
Conventional/Mainstream	Alternative
Unsustainable	Sustainable
Non-renewable energy	Renewable energy/ closed loop
Global/ long supply chain	Local/ short supply chain
Fast	Slow
Price	Quality
Agrochemicals	Organic/ sustainable farming
Contaminated	Safe
Unhealthy	Healthy
Bad	Good
Manufactured/ processed	Natural/Fresh
Mass production (large scale)	Craft/Artisanal (small scale)
Quantity	Quality
Homogenization of food	Regional palates/ territoriality
Monoculture	Biodiversity
Disembedded/ Externalised	Embedded/ Internalised
Standardised	Specialised/ difference/ diversity
Intensification	Extensification
Hyper/Supermarkets	Local markets

Table 3 Adapted and synthesised from; Hill (2004) p. 555; Ilbery and Maye (2005): p. 824; and Robinson, (2009), p. 1765.

Of course Table 3 refers to generally accepted colloquial and general statements that may be presently used, however, as it is evident that the literature has moved beyond this, it is less evident that the producers and consumers have also done so. Furthermore, one of the authors cited in the table

recognise that the distinctions drawn in the table are difficult to maintain in practice (Ilbery & Maye, 2005a). There does seem to be a perception that an AFN implies a 'sustainable food network'.
Some scholars such as Ilbery and Maye (2005b, p. 334) have warned against associating 'local', specialist, and alternative foods (including their supply chains) together with sustainability, thereby raising awareness of the different perception customers have with regards to sustainability and forming an important debate in its own right. Where it is easy to simply view conventional vs AFNs, this linear and somewhat dichotomous association neglects the complex and heterogeneous nature of our food. A central and contested issue within the academic literature concerning AFNs is that it is not the case that 'alternative' denotes an absolute contrast to the 'conventional' food networks as there are multiple overlaps at various levels and throughout supply and value chains (Barbera & Dagnes, 2016; Ilbery & Maye, 2005a; Tregear, 2011).

3.3.1.1 Moving from conventional vs alternative to hybridity

Holloway et al (2007;) are often cited by scholars as a somewhat 'lead' in the debate shift from viewing AFNs in dichotomy with CFNs, that pitted one against the other in opposition, good vs bad, right vs wrong (A. D. Wilson, 2013). Wilson adds;

"A binary of alternative/conventional suggests the possibility of passing judgment on a particular model in its abstract form. Such a dichotomy minimizes the importance of considering the specific social, political and economic context in which these practices occur" (A. D. Wilson, 2013, p. 721).

Instead of this binary notion of thinking towards research concerning the viability of alternatives, Hill suggests a scholarly way of approaching the debates around the three 'matters of concern', rather than 'matters of fact': "*1. Gathering and assembling economic diversity 2. Human actancy and 3. Nonhuman actancy*" (2014, p. 551). Therefore, and in contrast to the majority of scholarly arguments, which just acknowledge the need to move the AFN vs CFN debate on, yet only present 'areas for future research', rather than a new way of thinking, we must consider what is potentially useful for the advancement of scholarly discourse on this topic area.

For example, Sage's 2014 critique of the positioning of AFNs, suggests that we must "*build international solidarity in defence of food sovereignty and establish a global coalition opposed to the corporate agri-food agenda of biotechnologies, land grabbing and nutritional impoverishment"* (Sage, 2014, p. 254).

When considering the three matter-of-fact viewpoints Hill proposes this decentres the debate on the principles of the SD agenda to the extent that the shift in mindset returns AFN research to the core principles of AFN movements; ecological, environmental, and economic distinctiveness. We are not in danger of returning the debate back to a dichotomous narrative here of CFNs vs AFNs, rather Hill (2014), quite rightly, is suggesting in straightforward terms that we move the debate forward to more socio, economic, and environmentally beneficial discourse. Where there are many debates within the AFN discourse that are still contested, such as quality, local, and scale, however, Hill's article signifies a concerted effort to stop focusing the attention on subordinate terms.

3.3.2 Political Economic Perspectives towards AFNs

With few exceptions, the mainstream political economy for most nation states is primarily a globalised capitalist approach which favours, in general terms, the so-called 'Washington Consensus' of neoliberalism (Peck & Tickell, 2002 as cited by Watts, Ilbery, & Maye, 2005). The 'free market' metaphor is often cited by scholars and politicians alike, whereby competition is implied, and business is often a case of competing on cost rather than quality; this especially applies to the food sector.

Arguably, this capitalist approach has an intrinsic favouring towards CFNs, as their business model and characteristics are structured in such a way as to make the value chain of a food network as competitive as possible, and often unsustainable in their processes (Sage, 2013). For instance, their advantage over smaller scale traditional food networks is in their supply chains, organisational structures, scalability and global reach, their replicability, and near complete autonomy over their operations (see O'Kane, 2012).

Our liberalised global trade has led to a *"locus of added value from the farm, and the more proximal transformation and processing industries, such as dairies and abattoirs, to the larger food-processing and retail sector"* (Ilbery et al., 2005, p. 117). Large-scale, mechanised farming practices, industrialised processing, and chain store and restaurant retailing have an overarching hegemony in terms of market share, and political and economic support. As a result of being centrally placed, CFN actors can 'lobby' or 'pressure' to have their voice heard by policymakers and consumers alike.

3.3.2.1 The 'Alternative Economy' in relation to AFNs

The 'exceptions' to this mainstream political economy are numerous and are situated in a host of different contexts and geographical areas. Take for example the situation in some of the developing economies in sub-Saharan Africa, where informal barter economies exist alongside the mainstream economy (Gibson-Graham, 2006); goods and services are often traded for each other with little or no financial transaction occurring This is a day-to-day occurrence in cities and rural areas of most African nations. In some cases, the barter economy is employed by some non-state actors who are operating in areas of conflict, using, for instance, forest products in exchange for other goods or resources (see Evans, 2004).

In Graham and Gibson's seminal work on the alternative economy; *The End Of Capitalism (As We Knew It),* originally published in 1996*;* the authors promote an alternative way of framing our economy to one that challenges the dominant capitalist view, which is inherently based on growth and consumption, their focus is to 'reclaim' in favour of a diverse community economy, based on ethics, environmental stewardship, and social considerations such as the feminist perspective of equality and diversity (Gibson-Graham, 2006). Johnston and Cairns also support the viewpoint that an eco-feminist analysis *"has much to offer the theoretical debates at the heart of this work"* (2013, p. 408). Gibson and Graham promote the recognition of diverse forms of economic activity that ultimately sustains the conventional economy by referencing examples such as; unpaid voluntary work, 'work-in-kind' for food, for example (in CSA), slave and child labour, the barter economy (predominantly in emerging economies but also in others), stay home workers, and the support of family and friends informally. All these less tangible and less accountable actions play their part in our societies, and especially in the food sector.

Additional cases of alternative political economies are found in the Caribbean, Central and South America; the financial crisis in Argentina during the early 2000s led to a nation-wide bartering network that has since developed into the 'Global Bartering Network' (Pearson, 2003); Cuba is another case in point with its 'second economy' of socially orientated trade, black markets, and extensive use of foreign currency, albeit illegally (López, 1995). More recently, and under rather troubling circumstances is Venezuela, where the petro-economy has collapsed resulting in all manner of alternative political economies forming, some savoury and some less-so (Mansilla, 2016). This list is a mere pen sketch of some of the more noteworthy political economic situations around the world and serves to complement the initial list at the start of the political-economic perspective section.

There are many more examples of developing nations and emerging economies which are experiencing similar situations in what is designated as the 'global south', yet these examples alone highlight the variety and fragility of some pressing issues surrounding the mainstream political economy.

To be clear, this is not to suggest that alternative forms of political economics should be perceived as a negative factor in relation to the conventional economy, or rather alternative economies are something that occurs only in crisis or troubled times. It merely demonstrates that it sometimes takes certain events to occur in order for alternatives or an opposition to the normal capital economy to surface. Of course, the context of this research study is situated in the food sector, chiefly in the 'global north', in developed economies which are somewhat stable and not in a position of crisis whereby people are living in major poverty, however, diverse economies still exist within them.

Contributions from a variety of studies place AFNs as an 'opposition' to global capitalism (Allen, FitzSimmons, Goodman, & Warner, 2003; Goodman, 2004; Murdoch, 2000 as cited in Tregear, 2011). This termed 'opposition' manifests in the desire to disengage from the conventional food systems that fit within a neo-capitalist political economy, to a more socio-economically just one. In doing so, a reconnection between food producers and the consumers is the desired outcome, thereby developing trust, long-term relationships and environmental stewardship (Eden, Bear, & Walker, 2008).

However, the literature is not without its contentions on the labelling of AFNs as an opposition force. Sonnino and Marsden (2006b) assert the claim that the label of 'alternative' is much more appropriate than the opposition as there is insufficient evidence that there is such a thing as a tangible opposition. Here in the UK, we find our opposition to CFNs as an alternative rather than radically different. There has been political support for AFNs, more specifically local and regional produced foods, often trading on quality rather than cost, as was highlighted some time ago in the 2002 governmental 'Curry Report' (as cited in Sonnino & Marsden, 2006b, p. 191).

We must be realistic when framing discourses concerning AFNs and the political economy, and before we continue, it is important, and somewhat anti-climactic, to state a reality of our time, the zeitgeist with regards to transformative changes; "*as long as the intrinsic processes of democratic structures remain dictated by short-term electoral and economic goals the qualitative system changes as they proposed and understood in the scenarios cannot be straightforwardly considered" (Crivits et al., 2010, p. 1197).*

Crivits et al's mixed methodological review of the producer-consumer literature and expert-driven workshops appears to be the only article in this thesis' literature review which specifically, rather than implicitly, refers to this notion.

Governmental initiatives are typically framed within the lifespan of one or two parliaments. Administrations can be hesitant not only in implementing popular policy changes (that may be expensive or radically different, such as a universal basic income), but also they may not want to create 'success stories' for the next administration to take credit for.

It is therefore appropriate when considering issues surrounding the political economy that we look at the private sector, as well as the public, (if possible a combination of both) when discussing vertical integration and a move towards sustainable production and consumption of our food and drink. A further consideration before further reviewing the literature on AFNs is the three notions proposed by Gunderson in his article outlining the problems with ethical consumerism (2013) where he states the following;

> *"(1) Capitalism is inherently ecologically and socially harmful; (2) ''ethical'' commodities derived from alternative markets cannot fundamentally counteract the pervasiveness and scale of (1); and, because of (1) and (2), (3) ethical consumerism does not defetishize the commodity form, but acts as a new layer of commodity fetishism that masks the harms of capitalism by convincing society that the harms of capitalism can be rehabilitated with the commodity form itself" (p. 109).*

The claims made by Gunderson (2013) further ground the context in which AFN research is situated, but also promotes the notion that ultimately AFNs are more conventional than they initially appear to be.

3.3.3 Going beyond Actor-Network Theory

When studying networks in the broadest sense of the meaning, there is typically a focus on either the technological determinist approaches, which put a preference on technological change influencing the network's development, or a social determinist approach, which states that social category explains technological changes. This lends itself to ontological discourses concerning constructivism vs objectivism, however, this was discussed further in the methodology chapter of this thesis (See Chapter 4). Bruno Latour, the French sociologist who is a primary developer of Actor-Network Theory (ANT) developed the concept in order to overcome this dichotomous distinction and is in favour of

viewing networks in a 'socio-technical' account whereby the symmetry, or relations, between actors in a network, are viewed as equal in association at the point of contact with each other (Latour, 2005). ANT *"examines the complex composition of networks in the modern world and seeks to understand how the networks gain their strength and how they achieve their scope"* (Murdoch, 2000, p. 410). However, ANT neglects to discuss the wider social forces at play which may have led them to interact with a network. Therefore there is a need to consider alternatives to examine some of the wider forces that may impact on a network. This may be achieved by assessing AFNs on a social media platform for example.

Convention Theory (CT) has been highlighted as a viable theoretical alternative to actor-network theory for understanding the market orientation and actors within a network (Biggart & Beamish, 2003). This is because CT is interested in understanding both the context in which market orientation occurs and also the situation orders of worth or 'quality' that makes up the collective action of a network (Dubuisson-Quellier, 2013; Freidberg, 2003, p. 99).

3.3.4 Convention Theory

3.3.4.1 Defining Convention theory

CT is a helpful conceptual framework that scholars use in order to analyse the market orientations, or 'worlds of production' (Salais & Storper, 1992) and notions of quality, or 'orders of worth' (Boltanski & Thévenot, 1991, 2006). CTs in relation to AFNs is classically framed in terms of sustainable resource usage and production methods versus unsustainable production methods typically associated with CFNs. Although there are overlaps in these worlds of production whereby conventional and alternative create 'hybrids' of the two, along with historical and cultural change over time, thereby contributing to friction, failures and compromises between worlds (Ponte, 2016).

In their 2009 book on AFNs, Goodman and Goodman define CT as; "An influential theoretical approach to studying Alternative Food Networks. Identifying the norms, qualifications, and organisational forms involved in network coordination which uphold different conventions of 'quality', convention theory offers a general typology to distinguish product quality in terms of 'orders of worth' that specify the different logics orchestrating their production and governance" (p. 1). Ponte points towards a second direction in the development of the CT, by citing Eymard-Duvernay (1989), Slyvander (1995), and Thévenot, (1995) who consider 'price' as a factor within quality conventions, arguing that price cannot ultimately determine quality, and that trust is more important. It is the brand name, the long-standing relationships between consumers and producers, and the word-of-mouth recommendations that help to define quality and dispense uncertainty.

When reconsidering the world of production dimensions, the conventional, and thereby typically industrialised practices, all require standards, testing, inspection and certification in order to build quality and trust (Ponte, 2016). Discourse and research on AFNs are conducted from a broad range of multi-disciplinary social sciences, and under a range of different agendas, so this can be a very far-reaching topic area. In Ponte's review of CT in the Anglophone agro-food literature, he cites "*51 articles, books and book chapters that explicitly engage with convention theory either in terms of theoretical debate or review, or as applied empirically in agro-food studies to understand specific sectors, regions and case studies (38 entries)*" (2016, p. 16). Therefore CT should be used in order to help define the mixed and often multi-disciplinary nature of research in this context. CTs practical implications are best summed up by Diaz-Bone who states; *"Economic actors therefore rely on conventions as socio-cultural frames for mobilizing a shared interpretation of the objects, actions, goals, and collective intentions involved in situations of production, distribution and consumption"* (2016, p. 215).

In addition, Wills & Arundel who also state that; *"these agreements, when they become stable, are termed conventions and are used by actors to coordinate their interactions with others in a more predictable and therefore efficient manner"* (2017, p. 703). To summarise, CT helps frame our AFN discourse by outlining the political-economic principles underpinning these networks, the agreed upon terms of reference used within (including defining quality), and ultimately the criteria under which exchange, coordination and trade are conducted.

3.3.4.2 Worlds of Production; typologies of AFNs

When considering the 'worlds of production' dimension of CT, two main considerations are raised are the products specialised or standardised, and are they either generically produced or dedicated. Typically CFNs will be standardised in their approach, with more of a generic end product that can be replicable. In contrast, AFNs will be producing products which are specialist, and dedicated.
However, there can be a combination of classification of these worlds as Ponte (2006) points out;

1. Industrial world: standardised – generic (typically CFNs);
2. Network market world: standardised – dedicated (known as Hybrids);
3. Marshallian Market worlds: specialised – dedicated (typically AFNs);
4. World of innovation: specialised – generic (known as Hybrids).

Adapted from Ponte (2016) page 15.

As we can see, the different worlds of production highlight the complex nature of classification, although it does offer us a sound frame of reference from which to posit our discourse. The industrial world clearly seats the CFNs as they typically use standardised production methods (inclusive of technology, skills, and knowledge), and produce generic products. The same can be said for the Marshallian Market of worlds as typical AFNs produce very specialist products that are dedicated either seasonally, or geographically for example. Hybridity will subsequently be discussed.

Building upon the worlds of production classifications, this leads to the typologies of AFNs; there are three distinctive AFN group types that are commonly cited in the research literature; 1. Short Food Supply Chains; 2. Community supported agriculture, community gardens, and organic schemes; and 3. Specialist shops, farm shops, and farmers markets. Characteristics of consumption typically are associated with eating locally, seasonal produce, in favour of greater (or complete) plant-based diets, as opposed to out of season, animal-based produce sourced from global food markets (G. W. Feenstra, 1997; Jarosz, 2008). Community supported agriculture (CSA), community gardens (including allotments), box and organic schemes are AFNs that typically offer very low economic returns for the investment of time and effort, and are instead more focused on developing reconnection between the consumer and their food. For example, CSA and community gardens can redress some of the negative social inequality that is often typical of some AFNs, such as specialist farm shops that come with the label 'luxury' a testimony to their target audience of socio-economic communities with higher levels of disposable income, thereby potentially excluding some consumers due to the high price expectations for some products in their retail outlets.

There is a growing body of empirical enquiry that suggests that CSA, Community gardens, box and organic schemes typologies of AFNs successfully address some social inequality issues regarding food insecurity, availability and access, cost, quality, and inclusion with more productive social links and embeddedness (see Hinrichs, 2014; O'Kane & Wijaya, 2015; Winter, 2003). By reconnecting all members of the food system, and eliminating those who are not needed or required, (the intermediates or distributors associated typically with conventional food networks, and who often make substantial profits) the network helps to develop social embeddedness.

There is a need to distinguish between the different models AFNs base themselves on, chiefly their routes to market (or lack of), their drive, and their primary focus. This falls under three main distinctions;

- Market-based AFNs; where the network centralises around providing the market with produce;

- Retail led AFNs: where the network centralises on sales, often distinct, quality, premium foods;
- Outside/ or partially outside the market AFNs; the network is primarily a social initiative typical of community gardens and community supported agriculture.

In a study investigating the position of FMs as social enterprises, O'Kane and Wijaya found that they were "able to positively contribute to engaged governance and social infrastructure that benefited the local farmers, their customers and the broader community" (2015, p. 1146). This suggests that FMs go far beyond just retail outlets for produce. According to Ponte's (2016) worlds of production classification, FMs are arguably Marshallian Market Worlds which promote civic, inspirational, and domestic notions of quality conventions as categorised by Murdoch et al (2000). As mentioned previously, there are some negative social consequences, albeit potentially inadvertently, with farm shops charging a premium price for produce that is ethically and responsibly produced. However, at certain levels of our economy, it is necessary and also seen as a sound business practice to target consumers who are happy to pay more money for certain produce.

In a long-term researcher embedded study in the United States, Myers and Sbicca found that; "By moving toward a lower volume higher price model rooted in biodiversity small farmers are able to become ecologically as well as economically sustainable" (2015, p. 18). Therefore, the AFN movement values are still underpinned to an extent, however, the issue of social-exclusion is considered yet accepted in this context. This speaks somewhat to the opening assertions made by Gunderson (2013) with regards to the fetishism of the product "by convincing society that the harms of capitalism can be rehabilitated with the commodity form itself" p. 109. Again this is where we see the literature grappling with the debates around trying to achieve a paradigm shift within AFNs and are they a viable alternative to CFNs. When further conceptualising what we mean by AFNs, Venet al's 2006 review of AFN literature is helpful in listing the categories of AFNs in relation to their market orientation.

3.3.4.3 Quality Conventions within AFNs

As mentioned in the definitions of CT, quality conventions are an important dimension in CT as they set the scope and reach of AFN production and consumption methods. The traditional interpretation of 'quality' in relation to AFNs has tended to be categorised as somewhat separate from conventional food systems. For example, Sonnino and Marsden (2006b) argue that quality "*can involve anything that the conventional food system is not: an identifiable place of origin, traceability, aesthetic attributes, nutritiousness*" (p. 185). Furthermore, power dynamics within groups of actors can be affirmed or conflicted when defining quality conventions (Boltanski & Thévenot, 2006).

The notion of quality clearly goes beyond the physical outputs of an AFN (such as taste and nutrition); it is socially constructed and open to different interpretations in different and competing AFN contexts. Many scholars cite that quality is socially orientated to support local and often rural communities; establishing transparent relationships from the farmer right through to the consumer, as well as environmental stewardship principles (Migliore, Schifani, & Cembalo, 2015; Murdoch, Marsden, & Banks, 2000; Renting et al., 2003). This is in contrast to CFNs whose quality typically rests on lowering the cost of their products in order to be competitive, offering the customer consistency and predictability, and is often retailed in a convenient location such as in major supermarkets (see Claro, Laban Neto, & de Oliveira Claro, 2013).

Contrasting what 'quality' means in the AFN context with that of the conventional, Sonnino and Marsden (2006b) quite rightly raise the important issue that in Northern European countries; *"the 'quality' of food is determined more by matters of public health and hygiene than by organoleptic* [emotional] *properties. As a result, in the 'north' economic efficiency and responsiveness to the market, underpinned by health and safety legislation, are considered the most effective means of delivering quality food"* (p. 187).

The French sociologist Thévenot, a seminal figure in CT development, expands on 'quality conventions' by highlighting the role of the more commonly held views of quality in terms of social and environmental welfare, with specific branding with geographical areas, and argues that the social actors who lead these conventions do so through their own innovations, entrepreneurial approach, and strength of reputation (Thévenot, 2002).

Supporting the initial developments of Jon Murdoch in attempting to understand quality, Thévenot categorises seven conventions of quality which can be adopted by consumers:

i) **Commercia**l, based on price and commercial value of goods;
ii) **Industrial**, assessing the compliance with technical standards and reliability;
iii) **Domestic**, which are related to the concepts of interpersonal trust and traditional modes of production;
iv) **Public**, concerning the importance given to trademarks and brands;
v) **Civic**, which refer to the societal and community benefits of local products;
vi) **Inspirational**, based on the value of the passion conveyed by the products;
vii) **Ecological**, relating to the environmental sustainability of the goods and the production process.

(Murdoch et al., 2000; Thévenot, 2002)

The seven conventions of quality listed above help set some clear focus points to the notion of quality and helps to inform this research's understanding of what they can be labelled as either 'hard-quality'; which are the tangible features such as *"price, the industrial standards followed, and the attribution of trademarks and awards"* and 'soft-quality'; which applies to *"more blurred aspects, emphasizing the conditions of the actors, the local context, tradition, trust, respect for the environment, community values*" (Barbera & Dagnes, 2016, p. 329). Barbera and Dagnes continue to point out that in the context of AFNs soft-quality is much more applicable, however, they recognise that CFNs who capitalise on these soft-quality conventions, such as supermarkets who are bordering on hybridity, for example, Waitrose and Booths in the UK, cause further friction. This can, however, be seen as an opportunity to exploit the conventional demand for AFN based produce. By networking more effectively and being more 'entrepreneurial' in their approach to CFNs, the actors within AFNs may possibly act as agents of change (Watts et al., 2005). In a review of AFNs, Goodman positions the change from industrial quality to domestic quality conventions as a defining feature of the economic organisation of AFNs and signifies the overall paradigm shift that the AFN movements are aiming to create (Goodman, 2004). The reviewed literature does not explicitly state the quality conventions associated with the health benefits of AFN produced produce. Myers and Sbicca's, however, do imply some health benefits of eating locally; "*Physiologically, local food that is minimally processed is claimed to be higher in nutrients and lower in the salts, sugars, fats, and oils of many processed foods found in grocery stores and fast food restaurants. Consequently, local food is healthier food and can reduce the prevalence of diet-related disease"* (Myers & Sbicca, 2015). While their statement does hold a logical argument, it does neglect to reference any physical evidence to support this claim. Therefore, we must be careful not to generalise sweeping statements just because they sound plausible and sit with expected beliefs we may have on a topic area, as recommended by Born and Purcell (2006).

In Myers and Sbicca's study, however, they do have a substantial interaction period within an AFN to induce observations from. Their study included a two year period of embeddedness with an ethnically diverse, multicultural, working-class good-food-good-jobs food programmes in Los Angeles and New York City. Furthermore, 10 ethnographic, in-depth semi-structured interviews were conducted with participants. Their conclusions, amongst other things, suggested that empowering actors within the AFN to participate and have some say in the market orientation of food process promotes civic quality (Myers & Sbicca, 2015).

Renting proposes an additional concept of civic quality convention by way of 'civic-food-networks' (CivFNs); they are framed as an expression of civil society influencing market and state governance mechanisms (Renting, Schermer, & Rossi, 2012).

They are focused around the need to transcend market logic, promote ownership not in the classical sense of the meaning, and a focus on individual needs rather than that of the 'owner' (DeLind, 2011). Jaklin, Kummer, & Milestad argue that *"CivFNs become more than niche marketing strategies and have a potential to expand the autonomy of peasant farmers"* (2015, p. 44). This explanation of CivFNs clearly speaks with the CSA projects as they share ethical attributes and are, ipso facto, similar.

Hybridity in AFNs

Where we see examples of hybridity, a mixing with the two extreme worldviews, we have an overlap between the network market world and world of innovation as listed by Ponte (2016). Overall, issues of hybridity of AFNs can be seen as a combination of AFNs and CFNs "as part of ongoing, incomplete transition processes" (Sonnino & Marsden, 2006 as cited by Renting et al., 2012, p. 292). Furthermore, hybridity can occur when discussing the conventions of quality, for example, a specialist food retailer operating domestically, and exhibiting ecological conventions of quality, can develop a generic product that is retailed in both specialist farm shops, and also niche, but conventional, supermarkets e.g. the Fair Trade movement (Whatmore & Thorne, 1997). This hybridity can also be referenced by the 'Commercialisation' and 'Marketisation' of AFN movement values whereby CFNs exploit these for their own benefit often resulting in "*alternative food movements and markets coexisting in permanent tension*" (Goodman et al., 2013, p. 429). This initially poses the question whether the commercialisation and marketisation of ethical values is a bad thing for the ethical food movement in terms of loss of market share, and therefore, is it wrong for the conventional markets to capitalise on the AFNs territory by way of hybridity? And to what extent does this dilution of ethical, environmental and social values impact on quality foods? (Goodman & Goodman, 2009). The relationship AFNs have with CFNs is further expanded upon by O'Neill who states that AFNs "*interact with the conventional food system in complex and multiple ways, underlining that it is not a case of 'either/or', but that food production and consumption are heterogeneous and refracted through specific places*" (O'Neill, 2014, p. 112).

In the same way that many if not all businesses at some stage in their operations interact with a multitude of partners, so do companies within AFNs. It is rarely ever the case that they are stand-alone networks, devoid of contact with conventional food systems, and thereby raising the issue of hybridity further. However, even though there are a growing number of consumers that are keen to know where their food comes from, and other such concerns such as; transparency in the supply chain, traceability, and accountability, there will be few customers who solely purchase products from AFNs alone (Giampietri, Finco, & Giudice, 2016; Grunert, 2002; Turner & Hope, 2014).

This being said, AFNs were traditionally set up to circumvent the dominance of CFN in food production and consumption (Kirwan, 2004), and there is much debate concerning the future of AFNs such as organic and Fair-trade movements. In a recent literature review on the subject of AFNs and CFN hybridity in the Journal of Rural Studies, Le Velly and Dufeu conclude that hybridity has not been covered in great detail and that those studies that do mention it, do so with ambiguity, often "reflecting a relatively dichotomous way of thinking" (2016, p. 175) thereby implying that further research should consider dispelling the inexactness of hybridity.

3.3.4.4 Critiques of CT

One of the main critiques of using CT as a framework for AFN discourse is that, although it recognises the complex set of heterogonous characteristics involved in establishing conventions (both worlds of production and quality conventions), it assumes that an 'idealistic' homogeneous culture and a collective action exists between all actors involved in the networks (Connell, Smithers, & Joseph, 2008; Freidberg, 2003; Wills & Arundel, 2017). When examining the role of SFSCs in rural development, Renting, Marsden and Banks stress that "in reality, clear distinctions between various quality definitions can be often not be made and that boundaries between categories become blurred" (2003, p. 402). Over time definitions of what constitutes as quality, be that soft-quality, or hard-quality, can vary over time, be territorially specific, age and gender determined, and are largely a matter of interpretation and opinion between producers and consumers. Quality can be "constructed and negotiated" (Sonnino & Marsden, 2006b, p. 185), rather than product specific. Having said this, the seven conventions of quality do go some way in dispelling topical and fashionable food trend issues and focus on more macro rather than micro considerations. Furthermore, it situates research more favourably towards an ontological position of constructivism: "that social phenomena and their meanings are continually being accomplished by social actors, and that they are in a constant state of revision" (Bryman & Bell, 2003, p. 20). It does little to critically analyse the degree to which the social actors are embedded within these networks. This has led scholars to move beyond CT to discuss 'embeddedness' as a further theoretical underpinning pertinent to understanding AFNs. Given the global reach of our conventional food systems, and the legal and marketing context surrounding all actors involved, it is no wonder that such a functional approach to food governance is taken. Such direct statements like this help to ground the entire debate around our food systems in the realities of our current political-economic model, yet add further ambiguity to the complex issue of quality.

3.3.5 Embeddedness

3.3.5.1 Defining Embeddedness

By reviewing the selected literature concerning AFNs, a supporting theoretical framework to CT that provides deeper insights into the social actors and the territories involved comes from the notion of embeddedness theory. Embeddedness refers the conceptualising of AFNs in *"the reference to specific social, environmental, local and cultural context that define the specify and uniqueness of every experience, network and territorial practice of food production and consumption"* (Dansero & Puttilli, 2014, p. 629). This way of thinking about AFNs has been adopted from sociological literature, which has been developed for some time. In the seminal article on social embeddedness*, Economic Action and Social Structure: The Problem of Embeddedness* (1985), Granovetter asserts that;
"Most behaviour is closely embedded in networks of interpersonal relations and that such an argument avoids the extremes of under and oversocialized views of human action" p. 504.

His arguments, that all networks involve a degree of embeddedness, builds upon those of Polanyi (1944), regarding social embeddedness in the context of neoclassical, classical, and behavioural economics, and has served as a well-established reference point for social science based scholars researching embeddedness in agri-food studies (Cleveland, Müller, Tranovich, Mazaroli, & Hinson, 2014; Hinrichs, 2000; Morris & Kirwan, 2011; Murdoch et al., 2000; Simoncini, 2015; Winter, 2003).
However, the social relationships that are present in networks are typically viewed by notions of strong and weak ties, and can "*perform different functions for individuals and communities, such as bonding and bridging social capital*" (von Germeten & Hartmann, 2016, p. 527). Alongside strong and weak ties in embeddedness, there is the notion that networks can be over-embedded, and result in a lock-in effect, much like as in CFN, or conversely, under-embeddedness can lead to a position of stagnation and risk overtness (e.g. unsure of the market needs and detached from reality).

Kirwan provides a useful conceptualisation of embeddedness through describing and explaining of the manner and purpose of; Alterity, Valorisation, and Appropriation in the context of AFN and in particular Farmer's Markets (see table 4).

Table 4. The Utilisation of 'embeddedness' within the agro-food system source: Kirwan 2004 p. 398

Embeddedness		
Alterity	**Valorisation**	**Appropriation**
The manner in which certain actors within the food chain are intent on creating an alternative system of food production and distribution that is not based exclusively on the commodity relationship and profit maximisation.	The manner in which the 'value' of the natural, social and local embeddedness of production can enable comparative commercial advantage in the market exchange process.	The manner in which those actors operating at the globalised level extract commercial value from systems that were originally set up to circumvent their domination of food production and consumption.
The purpose is to incorporate social, environmental, equity and health issues into the production and consumption of food (as well as the economic), in order to more broadly address the issue of sustainable food production.	The purpose is to enable those areas marginalised by globalisation to remain economically viable by making use of their endogenous resources.	The purpose is to enable the maximisation of commercial profit by accessing emerging niche markets through incorporating the embeddedness of production processes, and in some cases subsequently globalising it.

Where Table 4 does offer a sound conceptual basis for discussing embeddedness, it neglects to consider the notion that social actors who are embedded within AFNs will have heterogeneous aspirations and different interpretations of the above classifications. Kirwan's descriptions within the table make some assumptions which are limited in scope, such as valorisation's purpose in asserting "*areas marginalised by globalisation to remain economically viable*". In addition to neglecting hybridity areas in the worlds of production, not all AFN producers are marginalised; some are very well placed in economic and social terms and offer niche, luxury items in urban areas, and for a profit (Kapferer & Michaut-Denizeau, 2014). This being said, the premise of embeddedness still stands to benefit scholarly discourse, and the three classifications are of relevance.

Alterity is at the very core of early discourse around citing AFNs as 'alternative' to CFN, and is seen as the defining feature politically and economically (Jonas, 2010; Marsden, Flynn, & Harrison, 2000; Renting et al., 2003).

Where CT can be used to contextualise the 'Alterity' through the lenses of 'worlds of product' and 'quality', Alterity in the embeddedness sense includes debates surrounding not only the diverse economy (Gibson-Graham, 2006) but also 'place and territoriality', (Goodman et al., 2013), and issues moving beyond the dichotomous AFN vs CFN by examining 'commercialisation and mainstreaming of quality' (Goodman & Goodman, 2009).

The three classifications can be seen as sequential in nature. For example, when establishing Alterity in an AFN, producers can build upon the distinctiveness of a values-based product, by means of establishing a high-quality niche product, then use an effective branding and marketing strategy; they can charge a 'fair' and appropriate price, which can potentially lead to hybridity (see Dansero & Puttilli, 2014; Sage, 2003; Tudisca, Di Trapani, Sgroi, Testa, & Giamporcaro, 2014).

3.3.5.2 Social Embeddedness

Social embeddedness is concerned with exploring the "principles of social connectivity, reciprocity and trust, characteristics which are essential to all economic life in general but fundamentally underpin grassroots and "alternative" initiatives" (Sage, 2003, p. 47). Furthermore, scholars assert that embeddedness underpins the notion that "social relations can substantially alter the nature of transactions between individuals, particularly where there is a direct and ongoing interaction between the participants concerned" (Kirwan, 2004, p. 397). Research with a developmental perspective has its focus on how AFNs often have a micro-level frame of reference, often in rural communities or on a localised basis (Tregear, 2011).

More qualitative and social science-based research is developed from this theoretical underpinning as issues such as ethics and values, quality, social networks and locality, all help to build the concept and narrative of AFNs' attempt to make net-positive socioeconomic contributions. Social actors within these networks are "*often thought as enlightened and conscientious small-scale farmers*", in opposition to conventional industrial operations in the food sector (Smithers, Lamarche, & Joseph, 2008 as cited in Albrecht et al., 2013 p. 154), and their values are aligned with social and economic justice, and environmental stewardship (Albrecht et al., 2013; Nousiainen, Pylkkänen, Saunders, Seppänen, & Vesala, 2009; Sonnino & Marsden, 2006b; S. Whatmore & Clark, 2006). While this is an idealised rhetoric, the reality is sometimes very different. Take for example the labour force typically employed within AFNs, some characteristics of the food sector itself, unfortunately, leave some workers in a vulnerable position with regards to job security, some employees are seasonal and have little ties with the organisation other than labour exchange.

This may, however, be different for owners or managers. For instance, the seasonal nature of some areas in the food industry leads to temporary or infrequent employment, particularly in migrant workers, and is seen as a contradictory to the socio-economic justice narrative (Albrecht et al., 2013). Where this is true with both conventional and alternative food networks, there is still little evidence that either model, particularly the AFNs, can solve this problematic inequitable situation (Albrecht et al., 2013).

The emotional attachment that some actors in an AFN place on their product or service within the value chain of this structure can be problematic. Some people can inadvertently allow themselves to be taken advantage of by overworking themselves, investing too much time, effort and money into what is sometimes their hobby or lifestyle business. Precisely because many actors within AFNs care so much about what they are doing in being that 'opposition' or 'alternative', there is evidence that they can become vulnerable, thereby diminishing some of the benefits of the autonomy provided by such a food system.

Another essential point to build on the previous issue of seasonality is 'where does the labour force come from in the first instance?' There is a growing body of literature that investigates the labour force available to AFNs, particularly in the case of food citizenship (Allen et al., 2003; Renting et al., 2012). The research to date paints a somewhat precarious picture as to the nature of disadvantaged people who may be low skilled in the labour market. While it is the case that the values of AFNs, which are linked with SD by way of social considerations, such as placing social quality within labour relations as a central objective (Born & Purcell, 2006; Goodman, DuPuis, & Goodman, 2012), there are still social inequality issues. Foundational to this is the view that there appears to be bias in the literature concerning the developmental advantages of AFNs in the sense that research is concerned with the microeconomics, rather than the macro. Although this is not to suggest that AFNs have sole hegemony over the term social embeddedness, as all types of food network involve this to some degree (Winter, 2003).

3.3.5.3 Food Security & Food Sovereignty

Building upon the debates of social-embeddedness in the popular discourse around AFNs, and especially in light of examples such as the Harvey Lawsuit case as referenced by Hill (2014), food sovereignty plays what is arguably a central socio-cultural aspect foundational to AFNs. Food Sovereignty is defined by the farmers' association "la Via Campesina" (translated as; the peasants' way'):

> *Food sovereignty is the right of peoples to define their own food and agriculture; to protect and regulate domestic agricultural production and trade in order to achieve sustainable development objectives; to detemzine the extent to which they want to be self-reliant; [and} to restrict the dumping of products in their markets .... Food sovereignty does not negate trade, but rather, it promotes the formulation of trade policies and practices that serve the rights of peoples to safe, healthy and ecologically sustainable production (Campesina, 2003).*

From La Via Campesina's definition of food sovereignty, we can see the similar notion of sustainable agriculture that makes up the underpinnings principles of the AFN movement. Given that much of what has been said in this definition is well established in the literature, Jarosz promotes research to be less concerned with defining what we mean by food sovereignty and encourages discourse to focus on the geographical aspects of scale, place and ownership in this context (Jarosz, 2014). Wald and Hill further complement this viewpoint, particularly by highlighting the importance of scale with regards to sovereignty as there is "*a lack of programmatic guidance for how to create a food system that is based on small to medium-scale producers*" (2016, p. 211). Jarosz, and Wald and Hill's papers stress the importance of viewing the social constructions of scale in relation to a food sovereignty, arguing that, it is not just a case of endorsing a local food network, but rather it is more appropriate and worthwhile to focus on what constitutes the politics that construct the local food network. For instance, multi-scale approaches to promote food sovereignty can be employed at different political and economic levels of a 'network'. Take for instance the fair trade movement, it operates on local, national and international scales, yet what is important for this movement is the values that underpin it; i.e. resisting inequitable and unsustainable practices of food production (Ilbery et al., 2005).

3.3.5.4 Ecological and Environmental Embeddedness

An extension of embeddedness, ecological embeddedness in the context of AFNs is understood by examining the environment and landscape. The concept of ecological embeddedness brings environmental and ecological discussions that highlight the producers and consumers are involved within the context of AFNs.

In one of the first academic accounts of AFNs, Whatmore and Thorne state that; "The issue of environmental embeddedness, while a key part of the practices associated with the strengthening of alternative food networks, is no less dynamic than their institutional and technological aspects" (1997, p. 246). This early account of AFN draws upon Whatmore and Throne's account of the international Fair-trade movement that is well established today, and is somewhat larger in scale and reach than what would be referred to as a 'typical' AFN exemplar.

According to Morris and Kirwan, ecological embeddedness can be divided into four dimensions as shown in table 5;

Understanding	**Realising**
A. The way in which producers understand the role and importance of ecological relations within their farming system and food enterprise, and in particular the environmental values that underpin their use of environmentally beneficial modes of food production. B. The way in which producers conceptualise and understand the relationship between the ecological conditions of production and the characteristics/qualities of the food products they produce.	The ways in which producers attempt to realise ecological benefits within their production systems through specific practices. This includes their suitability to localised ecological conditions, the selection of particular breeds of cattle and sheep, and the ecological management of landscape features such as watercourses.
Utilising	**Negotiating**
The ways in which information about the ecological conditions of production is utilised to influence the exchange process. This includes promotional materials that make links between the ecology of production and the eating qualities of the product on sale.	The ways in which consumers negotiate the ecological information they receive about food produce, that in turn influences their purchasing decisions and hence the exchange process.

Table 5 Morris & Kirwan's dimensions of ecological embeddedness (source Morris & Kirwan 2011 p. 327)

In their presentation of these dimensions, the authors add clarity and purpose to the role of ecology within AFNs and are similar in a conceptual basis to Kirwan's earlier work on classifying embeddedness by; Alterity, Valorisation, and Appropriation (2004). The authors summarise by supporting the need for further research to investigate the degrees to which various social actors embedded ecological considerations in different AFN settings (Morris & Kirwan, 2011). Uncertainty and variability characteristics of food and drink produce are seen as a challenge in the agro-food systems literature. In a case study analysis of ecological embeddedness of the wine industry, Krzywoszynska supports this assertion by stating that *"their greatest challenge [ecologically embedded produce], in securing a stable market network. How can ecologically embedded wines be sold when there is no certainty about their qualities?" (2014, p. 500).* Krywoszynka's concludes her article by citing that quality should be valorised and exploited by AFNs as the distinctness and taste of differing produce is what makes a culinary journey appealing, and further cultivates open taste and promotes normative change in the direction of ecologically embedded food and drink.

Recent studies examining ecological embeddedness within the AFN literature explicitly state the need for more research on this topic area, for example a study from the United States concerning the ecology of alternative food landscapes concluded that there was this need; *"both the farm and landscape level, particularly the ways in which social relations influence ecological relations and vice versa*" (Hedberg, 2015, p. 798). Ultimately, this links back to notions of sustainable development, particularly with regards to the state of agriculture and food production in light of the UNMDGs 2 and 12, amongst others, as shown in Figure 3 (page 25). Here, there is a need to develop an approach to feeding a growing population, with ever increasing demands on resources, against the backdrop of a fluctuating price of fossil fuels and other sources of diminishing natural capital (IAASTD, 2008). AFNs and the issues discussed play their part in developing this approach due to the SD related underpinnings, chiefly social inclusion and environmental stewardship.

The debates surrounding organic agriculture use all four ecological embeddedness dimensions presented by Morris and Kirwan (2004). For example the 'utilisation' and 'negotiation' of organic produce has clearly been a focus of producer and consumer-related research on AFNs and is seen as a contested issue (Guthman, 2008; Qendro, 2015; Seyfang, 2006; Verneau et al., 2016), yet few studies build upon this, although labelling and the governance surrounding certification of organic produce were prevalent.

In a paper entitled *Alternative Modes of Governance; organic as civic engagement*, DuPuis and Gillon's (2009) account of the Harvey lawsuit case in the United States brings to the forefront of the organic debate the issue of governance in the argument of standards over process. The Harvey case of 2002 involved a lawsuit which saw Arthur Harvey, an organic blueberry farmer from Maine, USA, challenge that ecological and social principles should be encompassed in organic certification, thereby incorporating process as much as standards in the organic movement. In the context of AFNs scholarship, this is a noteworthy case, particularly for research on AFNs in the United States. The Harvey case was an attempt to bring the organic movement's values back to the AFN theatre, and away from an ever-increasing conventional and big business hegemony that has come to 'claim' organic produce. However, it is the case that the "political economy of organic agriculture can mimic conventional industrial agriculture in its structure, capitalization and falls short of agro-ecological ideas due to market competition" (Jarosz, 2008, p. 233).

3.3.5.5 Territorial Embeddedness

Territorial embeddedness is typically associated with issues surrounding localness, place and space. On an international scale, primarily European, research on the variation of food systems in European countries is long-standing and far-reaching in its enquiry. Examples from Spain, Italy, France, and Greece are common in the literature, especially as much food in these nations is still linked with traditional methods: culturally and community-driven, and culturally specific.

Territorial embeddedness can also be applied to solely urban areas, as outlined by Curry et al there are broadly speaking, three areas of urban food production; closing the cycles of organic waste, water and nutrients; shortening of food chains, and the multifunctional use of land in urban and peri-urban areas (2015, p. 92). However, the distinction between urban and rural is less applicable when returning to the literature by Hill (2011) with matters of concern rather than matters of fact. Conceptually the distinctions between urban and rural are made, and also peri-urban areas are mentioned in the literature (Paül & McKenzie, 2013), however; *"consumers from the city and its surroundings seem to be more interested in looking for alternative food chains, perhaps because they experience a strict separation between the conventional supermarket model and other supply chains"* (Barbera & Dagnes, 2016, p. 328).

What is more pertinent however is the increasingly changing nature of food production with the growth in technological capabilities and increasing demand for food, both meaning that the previous distinction between urban and rural food systems are now changing. Vertical farming is an example of urban food production, with use of architecture with technology to urbanise food production is a growing trend, primarily in large metropolitan cities such as London. It is sometimes the case that certain restaurants will grow some of their fresh produce on site, thereby having complete autonomy on taste, size, colour, genetic variation, and ultimately helps to build a perceived alternative quality (Curry et al., 2015). Such developments have the potential for significant policy implications, especially when the previously rigid dichotomy between urban and rural was so well established; rural was food production, and urban was food consumption. One policy implication is the need to support local authorities and social movements in re-aligning funding and support to urban projects, and thereby to consider to what extent this will hamper rural development efforts if any.

3.3.5.6 Vertical and Horizontal embeddedness

Sonnino and Marsden, build upon arguments of Schweizer (1997) by arguing in favour of conceptualising embeddedness by the facets of 'vertical embeddedness', which frames issues of institutional and governance systems (including compliance and regulations), with the 'horizontal embeddedness' which takes into consideration local agency and influences how AFNs operate and are coordinated (Sonnino & Marsden, 2006b). By taking into account a bottom-up inclusion of the social actors in an AFN, and combining their values and socio-cultural needs with the top-down vertical dimensions of embeddedness, research on AFNs can provide a holistic and joined up narrative of development that is suitable to the economy as a whole (Murdoch, 2000).

The horizontal dimensions are grounded in the economic networks of production and manufacturing, consumption at retail outlets, the marketing of products, places, and brands, and other 'spaces'. Vertical dimensions are concerned with institutional frameworks of local governance (including local authorities, leader programmes, Local Action Groups, and Community Led Local Development); regional actors such as Local Enterprise Partnerships. To be clear, 'space' can be framed by way of the social, political, intellectual and economic spaces (G. Feenstra, 2002).

In their article entitled; *Beyond the divide: rethinking relationships between alternative and conventional food networks in Europe,* Sonnino and Marsden (2006b) help to advance the debate surrounding CFN vs AFN in this context by highlighting the fluidity and ever-changing nature of de-localization and re-localization (see table 6).

Table 6 shows the widely accepted descriptions associated with either CFNs or AFNs at each relational stage. However, what is interesting is the introduction of changing competitive spatial boundaries. We have discussed how commercialisation and marketisation of some AFN values have led to CFNs 'encroaching' on the traditional market orientations of AFNs (Goodman et al., 2013), for example through organic produce (Qendro, 2015). However, we must also consider that AFN producers, retailers and marketers have fundamental characteristics that are in stark contrast to the conventional, although there is overlap, especially in hybridity as discussed earlier (Le Velly & Dufeu, 2016).

Type of spatial relationships	DE-LOCALIZATION Conventional agri-food		RE-LOCALIZATION Alternative agri-food
Producer relations	Intensive production 'lock-in'; declining farm prices and bulk input suppliers to corporate processors/retailers		Emphasis on 'quality'; producers finding strategies to capture value-added; new producer associations; new socio-technical spatial niches developing.
Consumer relations	Absence of spatial reference of product; no encouragement to understand food origin; space-less products		Variable consumer knowledge of place, production, product, and the spatial conditions of production; from face-to-face to at-a-distance purchasing.
Processing and retailing	Traceable but privately regulated systems of processing and retailing; not transparent; standardized vs. other than spatialized products		Local/regional processing and retailing outlets; highly variable, traceable, and transparent; spatially referenced and designed qualities.
Institutional frameworks	Highly bureaucratized public and private regulation; hygienic model reinforcing standardization; national CAP support (Pillar I)		Regional development and local authority facilitation in new network and infrastructure building; local and regional CAP support (Pillar II).
Associational frameworks	Highly technocratic—at-a distance—relationships; commercial/aspatial relationships; lack of trust or local knowledge		Relational, trust-based, local, and regionally-grounded; network rather than linear based; competitive but sometimes collaborative

Table 6 Rural space as competitive space and the 'battleground' between the conventional and alternative agri-food sectors. Source: Sonnino & Marsden (2006)

3.3.5.7 Virtual connection and Embeddedness

Some scholars are convinced that there is a lack of "*economic, organisational and physical structures of the appropriate scale for local aggregation and distribution of food"* (Cleveland, Müller, et al., 2014) and as a result AFNs are seen as ineffective and serve only a minor role in the economy, society, and the environment. However, others argue that the lack of conventional business organisational and physical structures in AFNs, such as large-scale logistics and supply chain management processes, are not seen as a hindrance to AFN competitiveness as they are often not relied on to the same extent (O'Neill, 2014). AFNs do use CFN worlds of production conventions in order to get their produce to market, especially some of the more commercially focused AFN actors. Wholesalers can be used as 'middlemen', 'go-betweens', or simply intermediates, albeit with some reservation by actors who see them as a conventional actor who removes the reconnection efforts from the AFN movement values (Berti & Mulligan, 2016).

AFNs employ the use of other distribution and professional services, albeit in smaller scales, and the ever-growing importance of digital networking technologies enables actors at all levels to have greater connectivity, thereby suppliers, customers and retailers can easily communicate (Castells, 2011). As a result of the growing importance of the digital economy, the changing nature of business from the more conventional methods, such as purchasing from physical retailers to an increase in online orientations brings the AFN debates into a very contemporary setting (Wills & Arundel, 2017).
As embeddedness in AFNs is clear, this relates to an overarching theme of reconnection between as many actors in a food network as possible (Dowler et al., 2009). As previously mentioned, social and cultural connections and ties are ever present, and with the risk of repeating what has previously been discussed in the embeddedness literature, should view notions of reconnection in a new light: the 'virtual reconnection' as Bos and Owen (2016) introduce in their emergent research paper *Virtual reconnection: the online space of alternative food networks in England*.

Bos and Owen define virtual reconnection as; *"'virtual' is a description of non-physically existing space (but made possible by software to appear to do so) as opposed to the seemingly conceptual, spaceless, abstract concept of 'cyberspace"* (Bos & Owen, 2016, p. 4). Bos and Owen highlight the use of social media platforms such as Twitter and Facebook being a key promotional, communicative facilitator of interactions within an AFN.

Brynjolfsson et al present empirical evidence to support the assertion that niche products are more popular online (Brynjolfsson, Hu, & Simester, 2011 as cited in Wills & Arundel 2017). Especially non-perishables produce is more suitable than perishables unless there is a short/ quick delivery service available. The benefits of employing online retail, or e-commerce as it is also known, is that economic transactions can be done at any time, with relative ease from both the consumer and retailer (Tudisca et al., 2014). Specialist retailers and direct sell initiatives (in keeping with SFSC characteristics of minimalizing go-betweens and intermediates) can exploit online platforms to better aid their ambitions (Venn et al., 2006). However, Jarosz argues that *"Increased face-to-face interaction between growers and eaters enhances not only farmer income, but engenders trust and cooperation within a community*" (Jarosz, 2008, p. 234). Therefore, it is prudent to not neglect the offline elements of business when it comes to interactions and net-positive advantages to those involved.

From a recent Office of National Statistics report on household internet access in Great Britain, it was found that "*In 2017, 90% of households had internet access, and increase from 89% in 2016 and 57% in 2006*"and "*77% of adults bought goods or services online, up from 53% in 2008*" (ONS, 2017, p. 2). In terms of 'on-the-go' internet access, "*In 2017 in Great Britain, 78% of adults had used the internet "on the go" (that is, away from home or work) using a mobile or smartphone, portable computer or other handheld device. While almost all adults aged 16 to 24 years (98%) had accessed the internet "on the go", only 39% of those aged 65 years and over had done so"* (ONS, 2017, p. 6).

3.3.6 Local and Short Food Supply Chains

In addition to the two theoretical underpinnings of AFN (CT and Embeddedness theory), Short Food Supply Chains (SFSCs) can aid in understanding some of the dynamics in terms of supply chain management. SFSCs have two distinctive characteristics that are useful in conceptualising the term; 1. A focus of containing an AFN within geographical territorialities of place and space, and 2. Minimalizing the number of intermediaries within an AFN (Kneafsey et al., 2013; Parker, 2005 as cited in Benedek et al., 2014).

The first characteristic is concerned with geographical territorialities of the food production and consumption. Often literature will be grounded in terms of scale. They build upon the narrative of minimalising distances or confining a particular SFSC to as minimal a distance as possible and place a value on face-to-face interaction as a mechanism for aligning producer and consumers together within an SFSC (Renting et al., 2003). This first characteristic of SFSCs raises topical and contentious issues surrounding food miles, delocalisation, and localities.

A focus on locality, and associated food miles narratives, as a major consideration in promoting AFN in both theory and practice, can arguably lead to a 'local trap' where one indicator of an AFN plays a superior role and ultimate goal (Born & Purcell, 2006). In keeping with the general tone of the literature which is to promote the spread of AFN principles (grounded in SD principles, to varying degrees), this preoccupation with 'local' must be recognised, however, it should not be the principal focus, rather Born & Purcell argue in favour of incorporating socio-cultural views of the actors within AFNs. Born and Purcell further comment that small and large scales are relative to each other; they are embedded and interconnected and often blurred. By focusing on the local and not the multi-scale, actors in food networks are in precisely the same 'lock-in' relationship that CFNs are well-known for (Ilbery et al., 2004; Seyfang, 2006).

In terms of the correlation between reducing greenhouse gas emissions (GHGE) through reducing food miles, it has been long established that reducing food miles only accounts for a small percentage (~11%) of total GHGE, and a substantial amount of GHGE comes from the production itself (see C. L. Weber & Matthews, 2008). Furthermore, *"food miles are seen as a poor indicator of environmental and ethical impacts of food production"* (Edwards-Jones et al., 2008, p. 265). In a critical commentary on the concept of food miles, Coley, Howard and Winter compared farm shop versus large-scale mass distribution box scheme and home delivery, and found *"if a customer drives a round-trip distance of more than 7.4km in order to purchase their organic vegetables, their carbon emissions are likely to be greater than the emissions from the system of cold storage, packing, transport to a regional hub and final transport to customer's doorstep used by large-scale vegetable box suppliers"* (2009, p. 154). In this specific case of home delivery vs farm shop box schemes, the issues of locality being 'good' and global being seen as 'bad' are discredited by the authors to an extent. Of course, this study neglects to raise issues of the civic, and domestic quality conventions and pays little reference to advances in fuel efficiency and the rise of hybrid and electric cars being a factor in carbon reduction, albeit in a minimal way to date.

In a recent review of the operationalization of local food, including the notion that we must look beyond food miles, it was laboured as a decisive conclusion that we must challenge whether minimalizing food miles matches the goals of an AFN (Cleveland, Carruth, et al., 2014), further dispelling previous assertions pointing "considerable distances" being a problematic issue with SFSCs (Ilbery & Maye, 2005b).

The second characteristic is framed in keeping with the CT dimensions of AFNs with the desire to minimalize the number of intermediaries within the supply chain of the AFN itself. Some literature use this second characteristic of SFSC as a way of justifying or rather rationalising the supply chain decisions made by some AFN actors who disregard the first characteristic. This is particularly a practical concern when for example, a food producer needs to import a raw material that only grows in a particular climate, thereby extending the relationships within an AFN considerably (Dansero & Puttilli, 2014).

The 'shortening' of relations, regardless of spatial dynamics, in favour of supporting alliances that are value-laden, is "*based upon equality, collective interests, mutual trust and a fair distribution of revenues, costs and power"* (Roep, 2006, p. 14) and speaks more directly to the goals of AFNs in a holistic way, rather than just factors of location and shortening distances.

One of the criticisms of the first characteristics of SFSCs in relation to AFNs is that in some cases, the primary inputs that the producers use in order to make the food and drink are not always fully considered in the 'local' (Ilbery & Maye, 2005b). There is also a danger of CFN assimilating the local narrative to the advantage of their own food systems. The term 'local-wash', similar to the 'green-wash' is a phenomenon of adopting the deliverable end product and exploiting it for business opportunities and "*as a tactic as a means of hiding their own aims, which are often directly opposed to those of most alternative food system advocates*" (Cleveland, Carruth, et al., 2014, p. 285). This possibly 'foul-play' tactic, from the perspective of AFN actors, is perfectly acceptable in mainstream neoliberal economics, as consumers vote with their money, and buy into the claims of local and thereby sustainable or ethical in some way.

When it comes to the topic of AFNs, sometimes referred to as 'Alternative and Local Food Networks' (ALFNs) and SD, the traditional interpretation of an AFN is often grounded in specific places, and typically within a local geographical context, regularly with multiple benefits to rural economies and livelihoods (Kirwan, Ilbery, Maye, & Carey, 2013; Marsden et al., 2000; Tregear, 2011). For instance, Barbera and Dagnes define AFNs with "*proximity is a crucial feature of all these networks. Indeed, AFNs are characterised by a short production and distribution chain, integrating dimensions of spatial, economic, and social proximity*" (Barbera & Dagnes, 2016, p. 325). Here the authors are setting the scene, in essence, bringing a concept into a specific context, in this case, space and place.
Despite this, the degree to which localism is a key factor on whether or not an ALFN actually delivers on SD goals is still open for debate (such as prioritising environmental stewardship and social considerations over financial performance) (O'Neill, 2014). O'Kane (2012) holds a reserved view concerning ALFN's environmental stewardship performance over conventional food systems, yet at the same time cites opportunities for consumers to reconnect with their food, and with the producers, as being a positive feature in ALFNs.

Local food systems have in recent years been linked with developing rural economies, especially those who are in need of revival (Ilbery et al., 2004). Some local food actors *"promote local food systems because they can embody and demonstrate possible alternatives when other options for change seem foreclosed or beyond reach*" (Allen, 2010, p. 305). There is an assumption that the products made are 'local' and thereby imply that there are environmental benefits upon which to make ethical and responsible practice and consumption decisions.

However, this is a challenged notion in scholarly discourse as Edwards-Jones indicates that food miles are a poor indicator of the environmental and ethical impacts of food production. "*Only through combining spatially explicit life cycle assessment with analysis of social issues can the benefits of local food be assessed"* (Edwards-Jones et al., 2008, p. 265).

A further critique of SFSCs is that on the one hand, they do appear to promote inclusion, innovation and participation at local levels, however, at the heart of this relocation and territorialisation of foods is the very real notion that in terms of retail, "*consumer-based local food efforts are difficult to extricate from the dominant political economy and therefore may inadvertently reproduce extant social privileges"* (Allen, 2010, p. 305). Thereby echoing previous concerns of scholars who cite social exclusion and the 'stereotypical' view of the privileged and affluent AFN food actor (Benedek et al., 2014; DuPuis & Goodman, 2005). Much like the issues surrounding organisational structures, as discussed in the embeddedness section of this review, there needs to be vertical integration in order to situate SFSCs as a viable facet of AFNs.

Renting, Marsden and Banks support this notion by concluding in their somewhat early review on SFSCs and rural development by stating that; *"sustaining rural development through the evolution of SFSCs must be based upon both institutional support and new types of associational development involving a range of actors operating within the chains and their surrounding networks" (Renting et al., 2003, p. 408)*. Given the potential reframing of the UK economy post-Brexit, this collaboration may be a welcome development from the viewpoint of many actors involved.

There is an inherent characteristic of actors in AFNs and the consumers who use them, that they want to know where and how their food is produced (Morgan, Marsden, & Murdoch, 2008). Not least because of widely publicised controversies and scares in the food sector more recently, for example, the supermarket horsemeat scandal, there is an ever growing focus with relation to domestic, civic, and ecological quality conventions, including the provenance and traceability of food and drink (Goodman, 2004).

Both conventional and alternative food production systems make attempts to cater for this need. In supermarkets, for example, we see the 'Red Tractor' logo which indicates British produce, however, this does not mean that the beef you see in the supermarkets was bred in the UK for instance, thereby leading to a misleading and somewhat piecemeal approach to tackling the issue of food origin.

A study in the British Food Journal highlights this issue after analysing communications activities from providers of farming and food and consumer perceptions found that; "*the fragmented communication messages that they receive are not giving them a clear reason to consider the implications of their purchases for the British farming industry and the environment*" (Duffy, Fearne, & Healing, 2005, p. 17).

Although the dominance of conventional food production systems has not shifted towards the AFNs, Richards, Lawrence and Burch assert that supermarkets and agro-industrial foods are now in a position whereby they have to "*manufacture trust*" (2011, p. 42). This again highlights another area of interest that is contested as conventional actors have sought to redress the issue of provenance. In terms of a competitive business nature, this raises the question whether conventional actors adopting sustainable practices is a bad thing for small-scale producers and other actors within AFNs? If the philosophical underpinnings of AFNs are being adopted into the dominant food trends then consumers will be presented with more choice in where they can purchase food which is in keeping with their own values. This being said, it raises a question: do AFNs want their philosophical underpinnings to be conventional or mainstream?

3.3.7 Reflexivity and consumer consciousness

Statistics concerning the UK grocery market from 2012 indicate that the major supermarkets (for example Tesco, Sainsburys, ASDA) have over two-thirds of the market share, (traditionally stocking conventional products), whereas approximately 13% is categorised as 'other' (such as specialist shops, markets), and 5% internet based (DEFRA, 2014, p. 16).

Another essential part similar to the food sector's activities is that of the food purchasing and consumption choices customers make. These choices depend upon a myriad of decisions from socio-economic status and ethics to levels of disposable income, convenience, and lifestyle. Considering healthy food choices, there has been much research on attitudes versus behaviour gap regarding organic food choices (see Carrington, Neville, & Whitwell, 2010; Freestone & McGoldrick, 2008; Lusk & Briggeman, 2009; Verneau et al., 2016). One study highlights that the "*decision-making process is complex and the importance of motives and barriers may vary between products*" (McEachern, Seaman, Padel, & Foster, 2005, p. 606). This underscores the difficulties facing companies in attempting to maintain customer satisfaction, especially when the customers themselves make decisions based on a plethora of motives (Bell & Valentine, 1997).

This is not to say that there are not customers who specifically target certain products and brands, for example, luxury, specialist and alternative foods (Van der Veen, 2003).

Reflexivity in the general context of the food sector can be defined as *"the political practice that can make the power of alternative economies manifest in a more inclusive and liveable world"* (Goodman et al 2002 as cited in J. Johnston & Cairns, 2013, p. 406). More specifically, a 'reflexive localism' provides the "*foundation of a democratic local food politics that is processual, open-ended, and altogether messier – less dogma and romanticism, greater experimentation, more negotiation, more openness to alternative worldviews*" (DuPuis & Goodman, 2005, p. 8).

Reflexivity is seen as a potential way in which AFNs can be culturally adopted in a broader sense and manifested by actors throughout food systems; producers and consumers alike, reflexivity is seen as a potential way in which AFNs, and their links to sustainability, can play a less marginalised role in our societies, thereby moving from 'alternative' to 'conventional' in mainstream thinking (Selfa, Jussaume, & Winter, 2008).

Seyfang, when examining ecological citizenship and sustainable consumption in organic food networks, asserts that 'ecological citizenship', through reducing ecological footprint, could be a *"driving force for sustainable consumption, via expression through consumer behaviours such as purchasing local organic food"* (2006, p. 388). Seyfang not only concludes that education, outreach and community coherence is fostered both ways (producer to consumer, and vice-versa), but also that through the consumer, is therefore equipped with a; *"personal commitment to the global environmental and social justice rather than top-down restrictions"* (p. 394). By the vertical integration of actors from all levels of the production and consumption having a similar social context in which their values and decisions are based, this links with social-embeddedness and the overall drive towards SD.

A reflective consumer can be situated in the context of the 'slow food' movement, where the researching, selecting, purchasing, preparing, cooking and consuming items of food and drink are all seen as pleasurable experiences. Notions of taste, provenance, seasonality, connection, and responsibility are framed within this context, often leaning towards a view of preserving 'local' livelihoods, and an appreciation of the production methods at a primary level (Krzywoszynska, 2014). Earlier research on AFNs typically frames actors within as predominately white, middle-class, and affluent (DuPuis & Goodman, 2005).

Even so, more recent European studies have supported this to an extent, for example a study investigating the values of actors within Hungarian FMs concluded *that "relatively young, educated and innovative group of small-scale farmers are interested mostly in selling at the newly introduced farmers' markets*" (Benedek et al., 2014, p. 10). However other scholars have criticised this assertion as leading to "*reification or simplified racial schemas; obscures potentially more important dimensions of difference and solidarity; and promotes circular and thereby untestable and irrefutable arguments" (Lockie, 2013, p. 414).*

Lockie has criticised this view before when attempting to redress the typical organic consumer stereotype in his critique of the 'citizen consumer' by firmly stating that "*they do not conform to the stereotype of the middle-class health nut to nearly the extent that marketing to this stereotype suggests they should. Most studies have found very little relationship between rising income and rising consumption of organic foods (Lockie, 2008, p. 198)*. Lockie further adds that there is a broad range of motivations for consuming organic produce, namely; values, well-being, and concerns for health reasons, and that citizen-consumers proactively re-invent themselves. In an examination of Italian AFNs, Barbera & Dagnes substantiate this claim by asserting that price does not seem to constitute an obstacle to the spreading of AFNs in general (2016). Furthermore, a recent article reviewing 73 journals articles on 'consumer perceptions and preferences for local food' by Feldmann and Hamm found that "*consumers are willing to pay a premium for local food"* (2015, p. 152). The discounting of price as a barrier to AFN food types, combined with the dismissal of 'stereotypes' that organic consumers are well-to-do, middle-class, and health conscious, is somewhat challenged by research from Lockie and others, however, there are counterclaims to this by additional research focusing on specific consumers as participants.

For example, Johnston and Cairns' investigation into reflexivity by way of interviewing participants who were mothers revealed that some consumers often felt unsatisfied with "*their ability to enact this reflective practices through their food purchases – especially when juggling a host of responsibilities with limited time, energy, and money"* (2013, p. 407).

Drawing from their research, particularly in the context of mothers, they conclude that the "*reflective consumer is a classed, gendered project – one that privileged mothers have much greater access to, but still leaves them feeling inadequate*" (p. 407). The authors of this article go on to cite a consumer reliance on 'others' to do the 'reflective practice' for them, whether it is through trusting labels or shopping with retailers who are deemed to be ethical in their sourcing policy.

When it comes to the decisions mothers make with their choice of food for their children, the issue is of great importance. It speaks to the wider debate on tackling public health issues such as obesity through unhealthy diets, and food security (inclusive of price).

Perhaps Lockie's suggestion that consumers 'reinvent' themselves can be applied in this case as mothers are actively reflexive towards their roles as carers for young. Furthermore, this short critique from the literature demonstrates again the complexities and reservations that must be made at times. In terms of vertical integration within the AFN discourse, the notion of reflexive governance has been a subject of attention by Marsden, who states that *"it will be necessary to create policy spaces for more place-based forms of reflective governance"* (2013, p. 130). As the United Kingdom is currently going through a period of adjustment with Brexit (the referendum which has resulted in the UK now leaving the EU), resulting in more of a national focus in terms of food provisioning. Without the certainty of EU level CAP support (both pillars of funding; 1. Direct payments and 2. Rural development), it is arguable that future policy decisions will have to be tailored, both financially and developmentally, in a much more considered way than previously needed. Therefore, Marsden's pre-Brexit suggestions of reflective governances have taken on a new level of significance, especially as we near 2019/2020 EU leave date.

In Marsden's 2013 review of the empirical evidence on food futures since the 2007/8 financial crisis, suggested that paradigm shifts, such as the crash, are sometimes needed in order to promote learning experiences that lead to 'new era' thinking. As stated previously, Brexit may be a paradigm-shifting moment in the UK which may lead towards more sustainable food production and consumption policies. Marsden argues that reflective governance occurs when a correct framing of the specific problem, and its potential solutions, is approached with a broad range of actors, at the differing level, that is; LEPs (Marsden, 2013).

Returning to the debate regarding food sovereignty, Sage's article on the engagement in food systems transformation finds that there is a growing consciousness concerning the building of a common cause with farmers and food producers worldwide (Sage, 2014). This desire to reconnect with farmers and producers is in keeping with the move towards creating global transformative change. However, not all food consumers will think this way, and we must not generalise and assume that an increase in reflexivity and citizenship towards food is rapidly becoming the dominant mindset. After all, alternatives are labelled as 'alternatives' for a reason; the conventional food networks are still the convention, for now at least.

3.3.7.1 Consumers and luxury items, consumer conscious

Some studies concerning AFN produce, primarily from the context of specialist retailers and up-market FMs, have investigated consumer perceptions of specialist, and also 'luxury' goods within sustainability driven; such as Kapfrer and Michaut-Denizeau whose research findings suggest that sustainability is somewhat contradictory to luxury food products (Kapferer & Michaut-Denizeau, 2014). Aside from this niche of 'luxury' food produce, there is a plethora of research aimed at understanding the decision-making process in relation to sustainability within the retail sector and highlighting the importance of customer-driven capabilities for investments in sustainability (for example Claro et al., 2013). In other words; giving the consumer the ability to fulfil their own sustainability-driven needs, much like the use of labelling of organic and Fairtrade, or transparency regarding provenance being easily visible.

Rather than just a customer focus, the motivations for this research project are aimed at increasing the conceptual development of sustainability with regards to how decision makers (such as owners and project leads across the food sector) in micro and small-and-medium-sized food companies view their production methods within the SD agenda. This can be used in conjunction with data obtained from consumers and other actors within a food network (for example wholesalers and intermediates). Something which might explain why CFNs have such a dominating market share is the widely accepted notion that "*many consumers have elected for homogenized and de-localized food products on the basis of costs, convenience and choice"* (Smithers et al., 2008, p. 339).

3.4 Highlighted gaps in the literature

This chapter presented many justifications for future research beyond of course the recent Brexit situation in the UK, although there were calls from the literature for *"further investigation into the potential transformation from the AFM by documenting, theorizing, and probing the political potential of these new confrontation based alliances and their pursuit of more healthy and fair agrifood systems"* (Myers & Sbicca, 2015, p. 25).

There is scope to develop an understanding of how AFNs can be scaled up and operated on a larger scale. "*Research in the next five years should focus on understanding current infrastructure, networks, and distribution options for alternative food systems, as well as the ability for some alternatives to make use of more conventional food system networks"* (Albrecht et al., 2013, p. 155).

More recent publications have also cited the need to explore the *"producers point of view about the redistribution of economic value along the chain and their bargaining power on price"* (Berti & Mulligan, 2016, p. 24), thereby specifically referring to the need to further understand specific food and drink companies views towards intermediates, or go-betweens, within supply chains. It is still not clear as to the extent of AFN characteristics and practices in an indirect sense, they *"may be highly significant in addressing sustainability" (Forssell & Lankoski, 2014, p. 72).* Other literature further indicates that there is a need to not just assume that AFNs are somehow better forms of food provisioning; "*social and ecological outcomes of each rescaling never must be assumed but always subjected to critical analysis*" (Born & Purcell, 2006, p. 197). Therefore, research must be sceptical and critical of claims present in current literature.

Other researchers have encouraged investigating the rhetoric of sustainability designated practices, and the reality of what actually occurs in relation to the wider food-systems goal (Grivins & Tisenkopfs, 2015). Other potential areas of enquiry would include the organic movement or issues of localness.

In addition "*more transdisciplinary research is also needed on the tensions between the increasing pressure towards standardisation"* (Roep, 2006, p. 23). Building upon the need to investigate practices is the notion that there needs to be more qualitative approaches in the;
"e*xamination of ecological embeddedness across a number of AFNs to reveal the various ways in which they become ecologically embedded, through diverse environmental values, practices and promotional strategies on the part of producers and the negotiation of these by consumers, and the relative importance of ecological concerns within their development and operation" (Morris & Kirwan, 2011, p. 328)*.

Therefore, investigating the qualitative, potentially subjective reasons why producers chose to grow or rear produce in a given way may be of value to the topic area.
This could shed light on social and ecological embeddedness efforts such as social inclusion and environmental stewardship.

It is clear that there is still a level of fragmentation within the food sector, even amongst AFN actors, This issue needs to be further investigated, as highlighted by Goodman et al. (2013) who state that we must investigate whether or not "*these divisions have weakened resistance to 'the appropriation processes set in motion by the dominant socio-technical regime'. These problematics deserve a prominent place on future research agendas"* p. 430. Therefore viewing the degree of connectivity within a given network may prove important to undercover further meanings behind divisions and potential conflict. Sonnino and Marsden (2006b) further cite the need for "*a stronger understanding of the nature and dynamics of the relatively embedded competitive spaces occupied by conventional and alternative foods*" p. 196. With this too comes the somewhat longstanding need for "more research into the functioning of local food economies in general" (Watts et al., 2005, p. 35).

When considering the institutional framework that are linked with AFNs, Sonnino and Marsden (2006) also state that the "*few case studies that have focused on the political and regulatory context of those networks help to identify the type of political action needed to stimulate and consolidate the alternative food sector"* (2006b, p. 192), thereby justifying the worth of investigating such exemplars of AFNs.

3.5 Chapter Conclusions

It was the objective of this chapter to achieve objective 1 of this thesis;

> *Contextualise the need for the research by critically examining the literature concerning alternative food networks in developed economies.*

As a result of this objective being set, it was made clear that this chapter would have its own specific objectives;

- Assess the theoretical underpinnings of AFN debates in the academic literature on this topic area;
- Understand the research trends surrounding the notion of AFNs;
- To identify gaps in our understanding of previous research on AFNs and outline opportunities for further research.

The following conclusion covers what was conducted in this chapter and justifies the successful completion of the objective set in this chapter.

The chapter began with outlining the literature review protocol. This included a description of the methodology that was used in order to conduct the review itself, the defined scope of the literature review, and how the literature was searched, analysed and synthesised.

The chapter was then concerned with the review itself; a systematic review of the published literature on AFNs from peer-reviewed journals. The review centred on the two theoretical underpinnings of AFNs; Embeddedness and Conventions Theory. The contributions of Hill (2014) in moving the academic debate on from '*matters of concern*' over '*matters of fact*' when it comes to AFNs vs CFN can be seen as an important signifier of the need to consider hybridity of AFN actors in future research, rather than traditional AFNs from CSA, FMs, or box schemes. Notions of quality conventions as highlighted through CT further revealed that there was much research still to be conducted on hybridity (as identified by Le Velly and Dufeu 2016). The political economic perspective raised awareness that the capitalist approach to business intrinsically favoured CFNs over AFNs (Gibson-Graham, 2006). As a result, AFNs are viewed as alternatives rather than oppositional. The world of production literature has helped to conceptualise the routes to markets associated with AFNs, and the contentious and heterogeneous nature of defining 'quality' was covered in detail (Murdoch et al., 2000; Thévenot, 2002). Literature concerning embeddedness introduced concepts of strong and weak ties, which correspond to lock-in or exclusion in AFNs, which is similar to CFNs. Social embeddedness literature has highlighted the importance of local food actors to encourage positive change and promote possible alternatives in the food sector through their entrepreneurial spirit (Allen, 2010).

The chapter summarised the importance of considering SFSCs as an aid in conceptualising the supply chain management relations present in AFNs, primarily notions of place and locality, and the preference of minimalizing the number of intermediates in a given supply chain. As the literature consisted of multiple references to the customers and consumers in AFNs, there was a summary of reflexivity on their part, which helped to ground the AFN discourse in the realities of customer relations with their food choices.

This chapter concluded with some highlighted gaps from the literature, which proved to be important when achieving the specific objectives of this chapter along with Objective 1 of this thesis. As a result, the methodology chapter was thoroughly informed as to the nature of the enquiry needed to fulfil the subsequent enquiry and ultimately the research aim of this thesis.

Chapter 4. Methodology

"*It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts*"

Sherlock Holmes,
in Arthur Conan Doyle's
A Scandal in Bohemia (1891)

4.1 Chapter introduction

The literature review chapter has gone a significant way in establishing a workable conceptual framework of AFNs, and their relationship to the broader SD agenda, thereby answering objective 1 of this thesis; *Contextualise the need for the research by critically examining the literature concerning alternative food networks in developed economies*. The literature review chapter identified in many of gaps within the existing knowledge concerning AFNs, as described in section 3.4, one of these for example being; the need for further research concerning the understanding of the physical make-up of networks, and distribution options of AFNs (Albrecht et al 2013).

This chapter builds upon the analysis and highlighted gaps in knowledge uncovered by the literature review by outlining the research philosophies and approaches used to collect data in this research project. The chapter clearly explains exactly how the data was collected, analysed and synthesised with the literature on this topic.

4.1.1 Objective of the chapter

The objective of this chapter is to clearly demonstrate the philosophical underpinnings of the data collection methods used, and then explain to the reader how the data collection process took place. This is an essential part of establishing the validity of the research findings; it aids future researchers in replicating the study and thereby makes the research itself more transferable and useful.

4.1.2 Structure of the chapter

The chapter is divided into three main sections; the first is concerned with the way in which the research philosophies of this research project are grounded, and the steps taken in order to select the appropriate epistemological stance. The next section outlines the research approaches used in order to collect the data. The final section presents the research ethics and evaluates the strengths and weaknesses of the methods used. It should be noted that all of the sections of this methodology chapter are closely linked, therefore they should not be viewed as separate, but rather as sequential and co-dependent. The chapter also ends with a brief summary of the state of the thesis up to this point.

4.2 Research Philosophy and approach

Philosophy from Antiquity to the evolution into science

It is of value to the philosophical underpinnings of this thesis that there is a brief account of some of the fundamental theoretical assumptions on what constitutes as knowledge. This short narrative provides an interesting and thought-provoking account of how two differing worldviews towards knowledge originated and prevail to this day.

The American Philosopher Wilfred Sellars begins his *Philosophy and the Scientific Image of Man* by stating: "*The aim of philosophy, abstractly formulated, is to understand **how things** in the broadest possible sense of the term **hang together** in the broadest possible sense of the term*" (p. 2). This is a good starting point when attempting to understand and interpret what we mean when we talk about philosophy as it is an unambiguously phrased definition; it refers to everything. Considering "***how things** in the broadest possible sense of the term*", refers to what Sellars defines as the 'manifest image', for instance, solid objects, living things, colours, words, and so on. Whereas the "***hang together** in the broadest possible sense of the term*" speaks to the 'scientific image', this being the research areas physicists are more accustomed to dealing with, such as atoms, particles, electrons, and so on. The links between the manifested image of reality and the scientific image are not simple to define and explain, this is precisely why we as academics have the natural, social and formal sciences, in order to make sense of the universe.

From a contemporary scholarly perspective, it would be easy to generalise and to say that throughout our history we as a species have used the established philosophies of scientific experiment, mathematics and observation in order to make sense of the scientific and manifested images. However, this has not always been the case; since antiquity, there has been a conflict between science and mysticism that somewhat still prevails today in some instances of our society (Clarke, 2013; Russell, 1920).

In contrast, for the idea that a mathematical basis is foundational for much of modern science, we can cite the philosopher and mathematician Pythagoras who lived between the 6th and 5th centuries BC. Pythagoras, along with Plato, Aristotle and many other subsequent eminent philosophers of the time, the notion that not only should scientific discoveries be suppressed from the general population and thereby not practically applied, and that observation and experiment should be discouraged entirely, but also that; knowledge was acquired by divination from the gods (Huffman, 1993).

The Pythagorean philosophy of making sense of the scientific and manifested images was based on a pious and fanatical combination of mathematics and mysticism, rather than mathematics with observation and experiment. This can be demonstrated clearly by their adoption of the Tetraktys (figure 7) as a symbol of divination and contact with the spiritual world, much like the Oracles at Delphi, whereby answer to questions would be provided supernaturally (see O'Grady, 2012, pp. 43-47). The basis of many world religions including; the Jewish Essenes, the alchemy of early Arabic scientists, and most significantly, the later inspired Platonic influences on the early Christian church, can trace their philosophical foundations from the Pythagorean philosophy (Ferguson, 2003). It can be argued as well that both the early mystic philosophers of Ionia and many of the world religions ultimately adopted this worldview as a way of censorship and control in order to assert dominance and promote their own teachings as truths over others.

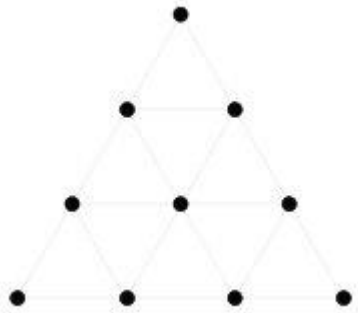


Figure 7 Tetraktys, perfect triangles

This way of making sense of the scientific and manifested image and thereby obtaining knowledge underscores the differences in worldview that the Pythagoreans and Platonists of this period held, which is in stark contrast to the established scientific method we know and use today.

Conversely, during the same period of time and in the same geographical area, Ionia, present-day Western Turkey and the Greek islands of the Aegean Sea, was the birthplace of the Greek intellectual revolution which led to the science we know today. In contrast to the Pythagoreans and Platonists were philosophers such as Thales of Miletus (625 BC – 546 BC) and his associates Anaximander and Anaximenes. Thales is cited as the originator of scientific thought and considered to be the first philosopher by Aristotle in his title *Metaphysics* (O'Grady, 2012). O'Grady summarises Thales' philosophical and scientific thinking by highlighting some of his achievements as follows; "*he calculated when the solstice was"…" calculated the height of the great pyramid by measuring the shadow it cast at the time when his shadow equalled his own height"… "he proposed a non-mythical theory of causation to explain earthquakes"…" applied theories in practical ways to protect Milesians"…"assisted Croesus in taking his army across the Halys River by diverting its flow" (2012, p. 29).*

Albright emphasises the importance of the Greek intellectual revolution by stating that it was "*far more drastic than the* [Italian] *Renaissance; it did not involve the recovery of a lost civilisation, but consisted essentially in an introduction of generalized modes of thought as well as of reasoning with the tools of logic*" (Albright, 1972, p. 225).

Instead of attributing the scientific and manifested images with supernatural and mystic reasoning, the early Ionian philosophers and scientists argued that they could make sense of their surroundings with the tools of enquiry, observation, experiment, and mathematics, along with a way of thinking based on reason, logic and scepticism. With this approach to knowledge, practical and everyday problems and curiosities were examined in order to not only have practical implications but also to enhance the human condition. Other notable philosophers of the time were instrumental in understanding the early sciences and new ideas, such as; Democritus, who first proposed that everything was made from atoms; Eratosthenes, who first calculated the circumference of the Earth using geometry; and Archimedes whose mathematical and technological achievements we still revere today.

However, by and large, it was the Platonists and Pythagorean's worldview that would dominate western philosophy by way of religion until the scientific Renaissance and Age of Enlightenment from the 16th to 18th centuries and beyond. Even then, religious (mystical) explanations for how the universe works still prevailed and early scientist were persecuted as heretics, for example, Galileo who was forced by the Roman Catholic Church to recant his support for the Copernican heliocentric solar system. One noteworthy example of the turning point from mysticism to science comes from the German mathematician, first astronomer and last scientific astrologer, Johannes Kepler and his three laws of planetary motion. Kepler embraced the Pythagorean and Ptolemaic model of the solar system which stated that there was a geometrical 'harmony' to the Earth centred solar system, based on five regular solids (Kepler, 1997).

Kepler's epistemological approach to research and knowledge, and his embrace of deductive reasoning is the key purpose of this short narrative. Once his original theory could not be proven he decided to collaborate and acquire astronomical observation from the Danish astrologer Tycho Brahe in the early 1600s at Prague. Upon acquiring more accurate observations, Kepler changed his hypothesis and as a result was successful in developing his three laws of planetary motion, and in doing so, directly enhanced the scientific method of inductive science (Whewell, 1858).

By rejecting the time honoured Ptolemaic solar system model and Kepler's own deeply held religious beliefs, Kepler demonstrates what the philosopher Bertrand Russell states as logical thought;

> *"The man [or woman] of science, whatever his hopes may be, must lay them aside while he studies nature; and the philosopher, if he is to achieve truth must do the same. Ethical considerations can only legitimately appear when the truth has been ascertained: they can and should appear as determining our feeling towards the truth, and our manner of ordering our lives in view of the truth, but not as themselves dictating what the truth is to be" (Russell, 1920, p. 8).*

In short, a philosopher and scientist should seek out the truth and accept it over their own personal hopes and aspirations towards the results. In this instance, it resulted in a pre-eminent paradigm shift in science (see Kuhn, 1970). Through centuries of further scientific enquiry, Western philosophy has been re-categorised into the contemporary sciences we know today; natural, social and formal along with their associated sub-branches, and what traditionally was referred to as philosophy is now firmly situated within science itself. Philosophy today plays its own part in both the natural and social sciences as it is still the essential foundation upon which we as researchers base our 'knowledge'. What constitutes as worthwhile, useful or even valid knowledge is a contentious issue where merits for polarised opinions can be reasoned, argued, discussed and implemented according to a specific research question, context, or purpose for research. This is where the branches of philosophy; ontology, epistemology, and methodology are situated. Discussions of rise of split in various research paradigms is relevant and therefore links to the epistemological and ontological assumptions of all research, and are outlined subsequently in this Chapter.

4.2.1 Ontology

The biologist Peter Medawar cautions that politicians, and the general public, "*assume scientists make their discoveries by the application of a procedure known to them as the scientific method", and yet there is "no such thing as "the" scientific method"* (Medawar, 1984, p. 51). Medawar expands on his assertion by stating that a "*scientist uses a very great variety of exploratory stratagems… a certain way of going about things that are more likely to bring success than the groupings of an amateur – he [or she] uses no procedure of discovery that can be logically scripted*" (Medawar, 1984, p. 51). This is an interesting position to take in relation to knowledge creation or 'discoveries' as Medawar puts it, as essentially he is stating that yes, scientists [and researchers] use certainly justifiable methods and must go to great lengths to dispel obscurantism by conducting research in favour of what is true, yet these depend on further assumptions we gain from data, reality, and the worldview which acts as our

knowledge premise (see for example Popper, 2005). Hence, it is important to have sound philosophical views on the nature of reality, or ontology, when establishing what constitutes as knowledge.
This being said, it can easily be the case that the personal assumptions we harbour towards knowledge can influence how the research data will be collected and upon which philosophical principles it is analysed and developed (Crotty, 1998).

For research to comprehensively answer a proposed question to the required level of scholarly thoroughness, the researcher's own personal beliefs, experiences and background will have to be subdued where possible, much like the example of Johannes Kepler and his mathematical struggles in the 17th century. This can be achieved by implementing a research approach which takes into account the bias and fallibility of researchers. The degree to which this is truly achievable and realistic is difficult to ascertain on an individual researcher basis.

Consequently, it is widely accepted that the philosophical approach to the research should be aligned towards the particular research project, not that of the researcher. Therefore, the researcher must be aware of any preconceived assumptions they may hold in relation to the research question, the methods used and how to interpret the findings (Saunders, 2012). In social science research, there are two commonly referred to positions towards social ontology; objectivism and constructivism (Bryman & Bell, 2003). The two contrasting ontological positions will be discussed below.

4.2.1.1 Objectivism

An objective ontological representation of reality positions social entities as existing externally and independent from social actors (Saunders, 2012). For example, teaching can be perceived as an objective social entity as the practice of teaching is separate from the social actor (the teacher). Thereby a research project investigating the social entity of teaching could, for example, study differing teaching approaches, teaching at different educational levels, the teaching of specific subjects, the regulations, standards, and conduct expected of the social actors within and so on. This could be done with little or no explicit contact with the social actor, the teacher, who is ultimately the implementer of teaching. In the business, management and social science research context, objectivism, therefore, is an appropriate social ontological consideration when researching organisations.

There are a plethora of organisational exemplars which can demonstrate and justify an objective ontological position. For example in the UK alone; The Royal Navy, the Post Office, the National Health Service, the London Stock Exchange, and British Airways. Of course, ultimately the research question of a given research project will influence whether these organisations are objectivism or constructivism.

When we analyse the constituent parts of these organisations we see that processes and procedures govern their operations and the people who work with them. They are ordered, there are regularities, these entities are often trans-generational, and the people who work in them are replaced periodically.

Entities play such a large part in the social phenomena of the actors who are associated with them that it is easy to conceptualise their importance from an ontological position. However, when considering these organisation we must also recognise that social actors are in the decision-making process of all entities; that is where a constructivism position is considered.

4.2.1.2 Constructivism

As outlined above, constructivism takes the alternative social ontological position from objectivism. Constructivism asserts that "*social phenomena and their meanings are continually being accomplished by social actors*" (Bryman & Bell, 2003, p. 20). With a constructivist ontological position, social entities are less important as a research focus than social actors themselves. Social actors take precedence and significance as they are the ones who are the influencing party in this context, and it is their interactions that promote achievements and ultimately change entities.

Already we can see an almost symbiotic relationship occurring between objectivism and constructivism. In a contemporary setting, and without being too fastidious; without social actors, there would be no organisations, culture, entities, and vice-versa. Therefore it is important that we approach the two ontological positions as a continuum which is interrelated and interdependent, as suggested in Table 7.

Question (dimension)	Continua	
• What is the **nature of reality**? **[Ontology]**	external	⇔ socially constructed
• What is considered **acceptable knowledge? [Epistemology]**	objective	⇔ subjective [constructive]
	observable phenomena	⇔ subjective meanings
• What is the **role of values**? **[Axiology]**	law-like generalisation	⇔ details of specifics
	value free	⇔ value bound

Table 7 Research philosophy as a multidimensional set of continua (Saunders, 2012 p. 129)

4.2.1.3 Ontological position

When selecting an appropriate ontological position to base research upon, in the context of AFNs and the SD agenda, there are merits for either an objectivist or a constructivist approach. It can be argued that the two concepts (AFNs and SD) are deeply connected with the values of the actors who seek to implement the agenda's aims and that it is the actors who constantly revise the agenda, which is a constructive approach. Several influential scholars within the literature reviewed supported this notion, for example Ilbery and Maye (2005) "[an AFN] *is highly unlikely to succeed unless there is an adequate demand and a well-connected entrepreneur*" (p. 342) and Renting, Marsden and Banks (2003) who state that *"The emergence of new food markets indicates that SFSCs are not the results of some kind of external, elusive `free market'. They result, rather, from the active construction of networks by various actors in the agrofood chain, such as farmers, food processors, wholesalers, retailers, and consumers"* (p. 399).

However running simultaneously with this social construct, it is apparent that this same agenda can be researched without situating social actors as the focal point; rather it is the organisational structure itself that is a central point:

"New economic networks of production, processing, and marketing always create new horizontal platforms of action and actor-space which develop their own discourses of competition and trust, negotiation and quality" (Sonnino & Marsden, 2006b, p. 190).

Conversely, it can also be the case that the structures of SD initiatives and AFNs can influence the social actors, rather than it being the other way around. When attempting to situate SD and AFNs within a specific ontological viewpoint a lengthy debate could easily ensue. On the one hand, as the 'worlds of production' and 'quality conventions' (Ponte, 2016) discourse surrounding AFNs is concerned chiefly with organisational operations and structure, they are firmly grounded within an objectivist ontological position. The 'socially embedded' nature (Sage, 2003) of AFNs, on the other hand, suggest that they exist as a result of social interactions between social actors in a less tangible 'network' entity as conventional food networks, and thereby a constructivist ontological stance would be more pertinent. Where this dichotomous relationship between a constructivist and objectivist ontological position exists, it may be appropriate to ground this phenomenon within the concept of a continua between objectivism and constructivism, as outlined by Saunders' 2012 Research Philosophy Table 7. Furthermore, when examining the thematic areas and theoretical approaches of the articles reviewed in the literature where it was a clear bias towards either ontological stance.

However, given the recommendations for further study at the conclusion of the literature review, indicating that there is a need to further understand the vertical and horizontal dimensional relations (including online through social media usage), this research adopts a constructivist ontological position. This will place the social actors in AFNs as the philosophical important factor of enquiry.

4.2.2 Epistemology

Deciding on the appropriate research philosophy to implement is seen as one of the first steps taken in order to ensure that the right research approaches (data collection methods) are employed on a given research project. Given that ontology is concerned with the nature of reality, and specifically how researchers view the world, researchers then need to apply a selected ontological underpinning when considering what is acceptable knowledge in the field of study, this is known as epistemology (Saunders, 2012). Epistemological stances are grounded in either the natural or the social sciences and a *"particularly central issue in this context is the question of whether the social world can and should be studied according to the same principles, procedures, and ethos as the natural sciences"* (Bryman & Bell, 2003, p. 13). There are two broadly contrasting epistemological stances on this central issue; positivism and interpretivism, with a variety of intermediates in between (for example critical realism). Although distinctive in their appreciation for what is acceptable knowledge, epistemological stances can be viewed through a multi-dimensional continua lens, see Table 7 on page 98, rather than seeing them as two separate positions (Niglas, 2010). The realities of some research projects dictate that multiple philosophical positions must be used concurrently, for example when several research questions demand differing routes of enquiry, thereby multiple mixed methods of data collection are necessary (Kelemen & Rumens, 2008).

4.2.2.1 Positivism

A positivist epistemological position towards knowledge typically values a strictly deductive approach, whereby a hypothesis is generated on the basis of a problem or question, and then empirically and quantitatively scrutinised in attempts to reject or accept a given hypothesis, thereby theory testing. A variety of data collection methodological choices can be employed in conjunction or in isolation, although these are typically quantitative in nature, and the typical strategies of a positivist research project would use experiment, surveys, and observation. This would be framed within an objectivist ontological concept of social reality. In terms of timescales, this research can be longitudinal or cross-sectional, what is more important is the confirmation or rejection of the hypothesis and a research project will be designed to reflect that accordingly.

Ultimately a positivistic epistemological stance uses hypotheses in an attempt to prove or disprove a theory, known as theory testing, and generally considers their validity by empirical and quantitative methods such as large data sets, controlled experiments, and observation. Results are intended to be generalizable and, as a result, replicable to other studies.

Replicability of results is an important characteristic of a positivistic epistemological stance, therefore research must be explicitly documented and described in order to allow independent verification of any claims made from the results of research.

Bryman and Bell (2003, p. 86) labour some criticisms of quantitative research;

1. Quantitative researchers fail to distinguish people and social institutions from 'the world of nature';
2. The measurement processes an artificial and spurious sense of precision and accuracy;
3. The reliance on instruments and procedures hinders the connection between research and everyday life;
4. The analysis of relationships between variables creates a static view of social life that is independent of people's lives.

As outlined above, research that has a positivist epistemological stance is typically focused on disproving or proving a hypothesis, is deductive and is more linked with natural sciences where regularities and cause and effect relationships occur, ultimately leading to law-like generalisations (Gill & Johnson, 2010 as cited in Saunders et al 2012). To better understand and develop a theory on a given phenomenon, research must sometimes connect with the everyday, and the relevant social actors, even if the knowledge may not provide precision and accuracy akin to the positivist epistemological stance.

4.2.2.2 Interpretivism

An interpretivist epistemological stance is likely to use inductive logic, whereby research is conducted in order to develop or build upon theory. Interpretivism contrasts the natural science based positivist epistemological position as the *"subject matter of social-sciences – people and their institutions- is fundamentally different from the natural sciences, - requires a different logic of research procedure that reflects the is distinctiveness of humans"* (Bryman & Bell, 2003, p. 15). Methodological choices for Interpretivistic research typically employs either mixed or mono-qualitative, using strategies such as case studies, ethnography, action research and grounded theory for example. These studies can be longitudinal or cross-sectional depending on the given social phenomenon being researched. This can be achieved through a variety of qualitative data collection techniques such as focus groups, interviews, open questionnaire surveys, and observations.

Whilst accepting the complexity and heterogeneous nature of humans and social contexts (Saunders, 2012); the subjective meaning, or feelings, opinions, views, and perceptions of the social actors within a given phenomenon are deemed as key features of enquiry in interpretivism (see M. Weber, 1947 as cited in Bryman and Bell 2003). The results of the data collected can be analysed using a broad range of suitable analysis procedures such as content analysis, narrative analysis, qualitative comparative analysis, and SNA, amongst others.

Much like positivism, there are potential drawbacks and criticisms of conducting qualitative research with an interpretivistic epistemological stance, which are well documented within the literature reviewed in this thesis. For example, limited sample size and specificity of individual cases are often cited as a limitation to the generalisation of results (for example Izumi, Wynne Wright, & Hamm, 2010; Pascucci, Dentoni, Lombardi, & Cembalo, 2016; Pole & Gray, 2013). When adopting a positivistic epistemological stance, results in science that cannot be replicated are not considered acceptable knowledge, especially when linking a theory with research, whereas an interpretivistic stance would question the relevance for qualitative research to need to have such a prerequisite. After all, qualitative research seeks to find a deeper understanding of the point of view of the participants, is typically focused on theory building, and seeks to understand meaning in a narrow, but ecologically valid setting. However, in doing so, Bryman and Bell suggest that subjectivity is a criticism and somewhat of a limitation of research that adopts an interpretivist epistemological stance, citing that *"qualitative findings rely too much on the researcher's often unsystematic views about what is significant and important, and upon the close personal relationships that the researcher frequently strikes up with the people studied"* (2003, pp. 299-300). Therefore attempts should be made by the researcher to be as objective as possible when analysing and interpreting the results and presenting findings. However, where this is possible it should be recognised that the research has developed these close personal relationships, much like Myers and Sbicca (2015) and their 'good food and good jobs' embedded nature of their data collection when spending three months as an intern with a food group. Much to the contrast of the positivistic epistemological stance to research, in some instances it is deemed necessary to have this constructivist, somewhat open-ended and embedded engagement with social actors.

4.2.2.3 Critical realism

'Realism' occurs when there is a synthesis, or shared features to a degree, with positivism and interpretivism. An epistemic realism stance towards knowledge recognises the social world and the natural order in a kind of way. Critical realism is a specific form of realism for which the "*manifesto is to recognize the reality of the natural order and the events and discourses of the social world and hold that 'we will only be able to understand-and so change- the social world if we identify the structures of work that generate those events and discourses*" (Carlsson, 2005, p. 96). This highlights an important notion that researchers cannot simply use one epistemological position to answer everything on a given topic, there need to be differing approaches depending on the research area.

4.3 Research Design

4.3.1 Qualitative Research Strategies

4.3.1.1 Ethnography

As ethnographic research is concerned with the researcher being immersed within the research field, primarily by observation, but also through interviews with participants (Bryman & Bell, 2003), this study is ethnographic by nature. This is due to the sense that this research project examines the real-life context of AFNs. This was achieved through the analysis of a social media network (which will subsequently be described and explained in detail), which in turn supported the selection of suitable interview participants. Unlike a long-term ethnographic research study, where the researcher would be embedded within a field for an extended period of time, the early stages of this research project saw the researcher embedded with the online dimension of a particular AFN.

4.3.1.4 Narrative Analysis

A narrative inquiry analysis is an approach to the analysis of data that is *"sensitive to the sense of temporal sequence that people, as tellers of stories about their lives or events around them, detect in their lives and surround episodes and inject into their accounts" (Bryman & Bell, 2003, p. 440).*

In terms of linking narrative analysis to this research, it was established through the literature review that it will be of benefit for the knowledge of this topic area to gain a further understanding of infrastructure, networks, and supply chain distributions opinions for AFNs (Albrecht et al 2013); in-depth ethnographic studies exploring both online and offline behaviours of AFN actors (Bos & Owen 2016); and a deeper understanding of how networks assemble without centralised structures (Levkoe & Wakefield 2014). As a result, it would be useful to have potential research participants reconstruct accounts of their network, including their own experiences in specific contexts.

This helps the research understand what "*Weick (1995) has termed ' organizational sensemaking'"* (as cited in Bryman & Bell, 2003, p. 441). 'This organizational sensemaking' relies on the researcher allowing the interview participant to recall stories and examples of their perceptions of their industry experiences. This way, a narrative of ecologically valid data can be collected and analysed. Furthermore, the interviewee is permitted to speak fully and at length about their own experiences, which is arguably the purpose of most interviews. The practitioners know their field very well and will no doubt be passionate about their experiences and wish to share this with the researcher. As a result, the subsequent narrative should be interesting by way of originality and uniqueness of the narrative.

4.3.2 Data collection and analysis techniques and procedures

Below is an introductory summary of the techniques used in order to collect both primary and secondary data, along with the procedures used in order to analyse the collected data.

The research strategies discussed above highlighted the merits of conducting multiple data collection techniques in order to triangulate and thereby generate a deeper understanding of the 'online' AFN in the given geographical area. Furthermore, given the espoused constructivist ontological stance of reality, combined with an interpretivistic epistemological view of knowledge, and the complex nature of AFNs and the SD agenda itself; it is necessary to provide as much contextual understanding and rich depth as is feasibly realistic, thereby this research is justified in doing so.

Initially, SNA was conducted in order to graphically represent the online centrality of the network in terms of connection (chiefly eigenvector centrality). The first stage of this SNA was collecting a sample size which could demonstrate a relationship between actors within the AFN using follows and followers on Twitter. The next phase of data collection involved using NCapture software of tweets used by actors within the defined network in order to conduct content analysis to examine the link (if any) with the SD agenda. Once this step had been conducted, a sample of actors within this network was selected for semi-structured interviews in order to gain a deeper understanding of the AFN. The interviews were analysed employing template analysis using NVivo 11 software whereby themes and emergent issues were revealed using text query searches.

4.3.2.1 Sampling Strategy

A snowballing sampling strategy was undertaken using the social media platform Twitter as a medium to demonstrate the connectivity of the network. Only 'business to business' Twitter followers and following statistics were considered as there were too many general members of the public (as individuals) following many of the organisations in the network, in some cases in the thousands, so much so that one researcher with a limited time frame could not collate this information unaided. Furthermore, as the focus of this research is on the consumers in AFNs, rather the focus is on the decision makers within the companies and organisations themselves, it was therefore not necessary to include consumers, customers, and people in general in the sample size. A detailed list of exclusion and inclusion criteria for the AFN actors can be found in Chapter 5 however, for now, the different types of 'actors' are listed and described in Table 8.

Code	AFN Type	Description	quantity
FDC	Food and drink companies	Companies who process food into a product for market	39
RFS	Retailer, farm shops	Farm Shops, farmers markets, specialist food shops	12
PB	Pubs and bars	Independent Public houses, Bars, drinking establishments	16
RC	Restaurants and cafés	Independent owned restaurants, cafes, and eateries	26
AF	Association frameworks	Go-betweens, buyers, distributors, associations or groups	13
IF	Institutional frameworks	Governmental departments, institutional support elements	3
		TOTAL:	109

Table 8 AFN Types, description and quantity

The researcher started with a single food company (an organic box scheme) known to operate in and around Chester; by looking at their Twitter page and collating a Microsoft Excel spreadsheet collating their 'followers' and who they were 'following' the snowballing sampling strategy enabled a quantifiable representation of the AFN in Chester and its region. In total, 109 separate actors (known as nodes) were listed within the online AFN of Chester and its region, and there was a total of 3,120 edges (known as vertices), the two print-screens represent the data sets collected as a result of the SNA and are shown in Figures 8 and 9.

	The Hollies	Cheerbrook	Smokehouse	Claremont Farm	Bellisbrothers	Lambing Shed	Farm Shop	Farm Shop
Hunters Gin	1	1	1	1	0	1	1	0
Flaming Bean Coffee	0	0	0	0	0	0	0	0
Nemi Dairy	1	1	0	1	0	1	1	0
Whiteys popcorn	1	1	1	1	0	0	0	1
Insensible Bros Company	0	0	0	0	0	0	0	0
Ollie's Orchard	0	0	1	0	0	1	0	0
Haughton Honey	1	1	0	0	0	1	1	1
Peckforton Water	1	1	0	1	0	1	1	0
Mrs Darlington's	1	1	1	1	0	1	1	1
Weetwood Ales	1	0	1	0	0	0	0	0
Cheshire Farm Chips	1	1	1	1	0	1	1	1
Mrs B's Queen of Cakes	1	0	0	0	0	1	0	0
Big 5 Sauces	1	0	0	0	0	0	0	0
Tatton Brewery	1	0	1	1	0	1	0	0
Cheshire Tea	1	0	0	0	0	1	0	1
Bim's kitchen	0	1	0	0	0	0	0	1
Mummy Bakes	0	0	0	0	0	1	0	0
Cheshire Icecream Farm	1	0	1	1	1	1	1	1
granny cool	0	0	0	0	0	1	0	1
Snowdonia Cheese Company	1	0	1	1	0	1	0	1
Flower & White	1	1	1	0	0	0	0	0
French Flavour	0	0	1	1	1	0	1	1

Figure 8 Print screen of Twitter vertices layout for SNA sociogram

1316	Hopper Coffee Sho	Urbano 32
1317	Hopper Coffee Sho	Whiteys popcorn
1318	Hunters Gin	Artichoke
1319	Hunters Gin	Backford Belles
1320	Hunters Gin	Black Circle Coffee
1321	Hunters Gin	Burt's Cheese
1322	Hunters Gin	C&W LEP
1323	Hunters Gin	Cheerbrook
1324	Hunters Gin	Cheshire Smokehouse
1325	Hunters Gin	Chester Food and Drink
1326	Hunters Gin	Claremont Farm
1327	Hunters Gin	Luke's & Gin Rickeys
1328	Hunters Gin	Marmalade Café
1329	Hunters Gin	NoW Food
1330	Hunters Gin	Peckforton Water
1331	Hunters Gin	Prestbury's Farm Shop
1332	Hunters Gin	Ring O' Bells
1333	Hunters Gin	Taste Cheshire
1334	Hunters Gin	Tatton Brewery
1335	Hunters Gin	The Faulkner
1336	Hunters Gin	The Hollies
1337	Hunters Gin	The Lambing Shed
1338	Hunters Gin	The Market Co
1339	Hunters Gin	The Moorings
1340	Hunters Gin	The Ship Inn
1341	Hunters Gin	Upstairs at the Grill
1342	Insensible Bros Co	Cheshire Farm Chips

Figure 9 Print screen of Twitter vertices

For example, the X-axis of Figure 9 shows 'Hunters Gin' who are following 'The Hollies', therefore a '1' was entered into the cell (the fill colour of the cell in blue was done for clarity), whereas they were not following "Bellis Brothers", therefore a '0' was entered as shown in Figure 8. The secondary data collected here from the public domain of Twitter, which was conducted in order to quantify the virtual actors within the AFN of Chester and its region.

Theoretical sampling was used when selecting AFN participants in the Twitter connections data set. When no new or relevant actors seemed to emerge who were situated in the category of an 'AFN', theoretical saturation was achieved (109 actors).

The companies selected were on the fringe of or could be described as hybrids, as they all showed elements of SD initiatives which speak to the original AFN movement's values. The category of the actor which has not been included in the literature, i.e. those mainstream, small-scale, locally based food and drink companies, producers, and growers, who would not normally be categorised as AFN in a strictly traditional interpretation, rather they would be viewed as hybrids.

4.3.2.2 Content Analysis

All Twitter pages were 'captured' using NCapture, and imported into NVivo 11 for content analysis. In addition to the Twitter pages, NVivo 11, a qualitative data analysis software, was used as an aid to analyse the content collected by the NCpature function of Twitter.

NCapture allows the content of a Twitter (and Facebook, LinkedIn etc...) page to be downloaded as a dataset and then 'imported' to NVivo 11 for further analysis.

Under the heading of 'Query' on Nvivo 11, there is the option to run, amongst other functions, the 'text search' and 'word frequency' searches of all of the sources (NCapture Twitter pages from Actors within the AFN). These two functions can quickly and quantifiably reveal what is being said by the actors on their Twitter page. The results of the word frequency and word search are presented in the Social Network Analysis Chapter (5).

4.3.2.3 Coding

The content analysed from the captured tweets was also used as an aid to the interview, especially when the topic of social media was being discussed by the participant. This showed the participant that the researcher was not ignorant of the Twitter AFN and its content, thereby potentially leading to provoke ecologically valid discussions concerning Twitter usage.

4.3.2.4 Interviews

The interviews were designed to be more of a conversation and to be informal as opposed to a formal interview setting. This approach was adopted in order to make the interviewee feel more relaxed and thereby enable them to speak more freely and openly in their responses to questions. The interviewer had a set of questions designed to be open and generally applicable to most actors involved within an AFN, with occasional 'steering' of the conversation taking place when needed (See Appendix 2 Interview Discussion Guide example). In total there were eight interviews with participants in the Chester AFN, ranging from 55 minutes to 130 minutes;

2 Institutional framework (IF1; IF3);
3 Food and drink companies (FDC3; FDC7; FDC35);
1 Retail farm shop (RFS1);
1 Associational framework (AF1);
1 Restaurant and café (RC15).

The interviews with governance and association framework participants had a similar set of open questions in order to allow quite distinctive responses. As the questions used during the interview were open-ended in a semi-structured in nature, it was possible for the participants to develop a narrative. The participant was able to talk fully and at length about a given topic which helped with the formulation of a broad-ranging thought chain, thereby leading to an exploratory narrative.

Participants were 'steered' back onto the subject area when it was clear that their narrative was going off topic to unrelated areas, or where the participant inadvertently discussed a subsequent topic of interest. At this point, the research participant was encouraged to continue to say more and not stopped, thereby maintaining the momentum of the interview. The participants selected for interview were done so on the basis of examining tweet content through content analysis, and also examining SNA through their high or low connectivity position within the network. In keeping with this project's interpretivist epistemological stance, it was necessary to gain a deeper understanding as to why certain actors displayed certain online views. As a result, the participants selected for interview were done so based on a subjective, yet rational basis. Venn et al (2006) highlights the notion that some research projects appear to simply select their research participants due to a set of constraints; "*The reader can often only assume that contact and selection of such cases was due to geographical proximity and/or prior knowledge of, or interaction with, members of the scheme, as many papers fail to reflect or comment upon the identification, selection and wider relevance of their cases"* p. 253. While this research project is limited by geographical proximity in terms of Chester and its region (Cheshire and boarding counties of North Wales), the participant selection strategy of this research project is aimed at recognising Venn et al's highlighted limitation in terms of participant identification, selection and wider relevance of their cases, by way of providing a potential solution to this issue.

Acquiring participants for an interview on the basis of a replicable and transferable methodology, the interviews benefit from gaining a degree of focus and pertinence that may not always be achievable otherwise. The researcher can tailor a semi-structured set of interview questions in order to maximise their relevance to the given participant and the phenomenon of interest, thereby increasing the usefulness of the results and any possible conclusions. Furthermore, if further research was to be conducted in another geographical area, for example, researchers could replicate this strategy sampling methodology.

Although this research is grounded in interpretivism, and the results of this study are not intended to be generalizable, by employing such a structured and generalizable approach to sample selection, this element of research design can lend itself to a positivistic, deduction and quantitative basis of research. Qualitative research by nature is concentrated on obtaining a level of depth on a phenomenon with quantitative research focusing on breadth. In doing so, qualitative researchers can use what is known as a 'thick description', coined first by Ryle in (1949) and further developed by Geertz (1973) in order to create a detailed ethnographic account of a particular research focus.

Lincoln & Guba expand upon this, highlighting that a rich database should be created in order to make judgements that are potentially transferable, including;

> *"The description must specify everything that a reader may need to know in order to understand the findings… findings are not part of the thick description, although they must be interpreted in terms of the factors thickly described"* p. 125.

Therefore, by recording, describing and analysing the primary data collected in this study, this thesis accurately described the information that was presented to the researcher during and after the primary data collection phase in detail and depth.

4.3.2.5 Template analysis

Template analysis is the process of organising and analysing textual data according to themes and should be viewed as an extension of thematic analysis (King, 2012). Thematic analysis is the broad style of data analysis categorising common issues and defining them as a theme, and template analysis follows a set of processes of refinement. The use of an initial template to create a subset of themes which then develops to the rest of the data set is an important distinction to make.

This refinement process can be explained in the following way; initially, all interview transcriptions should be read through and familiarised prior to coding. Secondly, an initial transcription of an interview is selected, and by intensively reading through the document in an idiographic way, an initial 'template' of what to look for in further transcriptions is developed. There may be some 'a priori' themes which can be used in order to help ground analysis without being too open-minded or rigid (King, 2012), the priori themes for this research are presented in Table 9.

Explicit apriori themes			
Conventions theory	Quality, worlds of production classifications (industrial, network, Marshallian, innovation)	**Sustainable Development dimensions**	Social, economic, environmental dimensions
Embeddedness	Social, ecological, territorial, food security and sovereignty, vertical and horizontal, virtual connection	**VISIS framework**	Vision, Indicators, Systemic linkages, Innovation attempts, Solutions

Table 9 Explicit apriori themes

The a priori themes were selected as they matched best what was being said in the literature on this topic area, however, this did not limit the future selection of themes and was not a control measure, rather an initial grounding aid. Finally, this initial template is used when reading through other interview transcriptions in order to see if there are apriori themes applicable elsewhere whilst also appertaining any further themes.

If a particular theme does not fit well with other transcriptions or falls into a much larger theme, then it is examined in an iterative manner with successive interview transcripts in order to come up with a final coding template. Once the final version of the template is established, it is applied to the remainder of the transcriptions within a data set, and the initial transcripts are revisited (Filippo, 2015). There is an account of the revision and updates when coding and developing the final template which is shown in Appendix 3. This has been attached to this thesis in order to demonstrate how the key themes have developed during the coding process through template analysis, and provide an indication of the thought process that has been conducted throughout the analysis process. Of course, other researchers may code differently and according to their own set of values, interpretations and preferences.

Braun and Clarke (2006) recommend using a three-layered systematic approach to coding using thematic analysis; whereby you start with descriptive codes, then cluster those into interpretive codes, then finally overarching themes. King (2012) argues that this clear distinction between interpretivistic and descriptive codes and template analysis can offer multiple layers of coding which can be a mixture of all three theoretical hierarchies. Therefore, this thesis does not prescribe a limit of hierarchical coding, instead, the focus is on depth and understanding with a clear scope, rather than a limited control measure such as the three-layered approach suggested by Braun and Clarke (2006). Integrative themes connect vertical and hierarchical clusters laterally. Some themes flow through and overlap with multiple codes. With regards to AFN discourse, a theme that runs through all of the data appears to be this opposition or alterity against CFNs.

4.3.2.6 Observation

In addition to the outlined data collection and analysis techniques outlined above, there was a large degree of observation and interpretation from the part of the researcher. For example, when interviewing participants, there were many opportunities to substantiate the assertions and claims made by interviewees such as the examining of menus which cited references to their suppliers. One food and drink retailer was interviewed at the café, as a result the researcher was able to examine the products that were on sale, speak with some staff who were employed by the owner, examine the food preparation area, and see ingredients and where they came from. Wherever claims were made by the interviewee, it was helpful to observe the realities of this in a first-hand nature.

A dairy producer was able to go into much more detail in terms of letting me know what their business model involved as I could see their office space and examples of grey literature that they were working with, their export plans, who they work with.

4.3.3 Research Ethics

4.3.3.1 Gaining access to participants

All the primary data collection was conducted after first contacting the concerned participant directly in order to set up an interview. Participants were contacted on a variety of platforms from social media such as Twitter and Facebook messages directly to the company, to letters of interest, face-to-face meetings at food-related events, or at retail outlets. In order to develop trust and ensure that correct research protocols were undertaken, every participant was presented with three pieces of information regarding the study; an invitation letter, participant information sheet, and a consent form (see Appendices 4, 5, and 6 respectively).

As social science-based researchers, we have the privilege of conducting investigations that cover a broad range of phenomena and come into contact with a myriad of different people. This privilege comes with many responsibilities when it comes to the participants, and the information we collect about them, be it organisational or personal. Researchers have an ethical obligation to ensure that the research conducted is of a standard that does not bring harm to anyone involved in the process. As a result, a set of ethical principles guide research, and should be seriously and rigorously implemented. Regardless of epistemological or ontological positions towards a given phenomenon; harm to participants, lack of informed consent, invasion of privacy and deception should be avoided at all times.

Causing harm to participants is unacceptable. The potential benefit for science versus harm to participants is, of course, an ethical consideration for some academic fields, notably Psychology, with studies such as the famous Stanford Prison Experiment (Haney, Banks, & Zimbardo, 1972) and Milgram's electric shock experiments (Milgram, 1963). These studies are very specific to psychology and offer particular exemplars, needless to say, they have served for so long as somewhat seminal examples of 'what not to do' when conducting research, and provide many academic fields with ethical issues to consider. In some research projects, notably social science-based qualitative studies; it is not always possible to examine when harm-to-participants is apparent, for example, an interviewer may ask certain questions that may relate to participants' past which may have been traumatic, embarrassing, or culturally insensitive to discuss. Therefore, it is important to consider, intelligently and sometimes intuitively, which discussions are pertinent to the study and which are not, and should be avoided.

As researchers are in this privileged position, where participants will engage with more personal or sensitive questioning, researchers must ensure that their anonymity will be maintained. Participants may be revealing profoundly important details of their lives and their engagement with a company under research. They may, for example, feel that their employment may be at risk if they say the 'wrong thing' or be critical about other individuals or the organisation as a whole. If they are the owner of the company themselves, they may reference commercially sensitive information about their suppliers and customers, which if revealed may have negative economic and reputational repercussions if made public knowledge.

A lack of informed consent is also not acceptable when conducting research. Participants need to know as much about the study as necessary to inform them as to the relevance of their participation. This includes stating the purpose of the research; why they have been chosen; the option to take part or not and also that they can remove themselves from the research project at any time; a description of confidentiality; what will happen to the results of the study; who has funded and organised the research; and ideally an independent person or organisation to contact, should something go wrong or any further information is required. In doing so, the researcher is answering typically held questions potential participants may have and is especially useful in gaining trust from a participant. This can potentially mitigate potential participants being 'put-off' from being interviewed in the first instance. Making participants aware of what is likely to happen during their participation in the research helps to dispel any myths or pre-misconceptions which might be harboured by those who are not familiar with academic research.

For example, prior to conducting an interview, a participant information sheet that informs participants that you would like to audio record an interview, providing a rationale for doing so, and then asking their permission to do so, is likely to minimise any potential worries about being audio recorded. If, for example, the researcher just started audio recording the interview without making the participant fully aware and gaining their consent, this would be inappropriate and could generate a lot of unintended consequences ranging from a participant exhibiting demand characteristics, or not being honest, to them withdrawing from the interview altogether.

Invasion of privacy is a further ethical principle of research that is important to recognise and mitigate against. To some degree, the nature of the questions being asked of some individuals or companies may be intrusive, or investigative in nature. However, these questions are framed within the context of the participant information sheet that is provided. The potential participant must be informed explicitly as to what is required of them and what their information is going to be used for.

By a participant providing informed consent, researchers can ethically conduct research with the knowledge that the participant is likely to know the line of questioning, or what the researcher is investigating. What is not acceptable is to deviate from the context outlined to the participant, for example, by asking questions that are too personal or something that clearly has no relevance to the research project. Furthermore, and linking with the principle of causing harm to participants, privacy extends to the maintenance of anonymity for individuals and organisations. Bryman and Bell (2003) draw researcher's attention to the data protection legislation in the UK, the 1998 Data Protection Act (p. 545) states that personal data must:

1. Be processed fairly and lawfully;
2. Be obtained only for one or more specified and lawful purposes and not further processed in any manner incompatible with that purpose;
3. Be adequate, relevant, and not excessive in relation to the purpose or purposes for which they are processed;
4. Be accurate and, where necessary, kept up to date;
5. Not be kept longer than necessary.

In keeping with the Data Protection Act, this research project will only keep the information regarding the participants until the completion of the thesis and its defence. In an attempt to be as accurate as possible, any interviews were audio recorded and then transcribed verbatim (See appendix 7).

The final ethical principle of deception is of utmost importance for business and management, social science-based research as there is the potential to be privy to extremely commercially sensitive information about a company or individual. Therefore, the researcher must not deceive the participant in any manner, either before, during, or after the research, intentionally or inadvertently. Of course, researchers sometimes withhold a degree of information regarding their exact area of interest so that participants do not simply inhibit demand characteristics and tell the researcher what they 'want to hear'. This being said, deception in this manner is minimal and causes no harm to any individuals or companies being researched as the researcher is enquiring into the true nature of phenomena rather than something which is staged for instance.

When conducting research, there has to be a willingness to accept when ideas do not conform to our worldview. The scientific method of questioning new ideas and applying rigorous and sceptical scrutiny of the established ones is the only way in which progress and change can be made in enhancing knowledge (Sagan, 1987). The results of any data collection process may not be falsified or changed to conform to previously predicted or intended outcomes.

This means that the researcher must have the integrity to ethically and honestly accept and be accountable to the findings uncovered through enquiry, even though they may run contrary to our wishes, ideologies, or desired outcomes. Where ambiguity or doubt is present researchers should consult the Academy of Management's *code of ethics* (AoM, 2006).

4.3.3.2 Ethical approval

The University of Chester's Faculty of Business and Management gave ethical approval for the use of interviews in this research project in June of 2016. Where secondary sources of data were collected via social media, it was not necessary to seek ethical permission to collect this information as it was present in the public domain. This being said, where individuals were identified via social media, their anonymity was preserved when referenced in conjunction with interviewed participants.

4.4 Chapter Conclusions

The chapter began with an account of the research philosophies that were pertinent to the success of this thesis. This research project takes a philosophical approach to knowledge creation that is grounded in relativist ontological underpinnings. The ontological underpinnings will be focused on understanding knowledge from a social constructivist position which has led to an epistemological position that favours interpretivism. This means that the results of this project will, therefore, be inductively analysed and interpreted.

The research design section of this chapter covered a list of qualitative strategies that were considered applicable to varying degrees, and as a result, it was established that this thesis would use a narrative analysis to discuss and analyse data.

The data collection and analysis strategy outlined the use of SNA as a tool for sampling strategy, which will be subsequently explained in detail in Chapter 5. The Content Analysis of Tweets using NVivo was described along with an indication of the coding strategy. Finally, this section covered interviews and their subsequent template analysis strategy. The chapter finalised with a presentation of the ethical considerations of this thesis and provided examples of a discussion guide, invitation letter, consent form, and participant information sheet. The subsequent chapter, Chapter 5 Social Network Analysis is the first results chapter of this thesis, however, to aid in the understanding of the SNA process, there is an element of description which is intended to match with the results and avoids unnecessary repetition.

Chapter 5. Results of the Social Network Analysis: A case of Chester and its region

"Part of the inhumanity of the computer is that, once it is competently programmed and working smoothly, it is completely honest"

Prof. Isaac Asimov
In Change! (1983)

5.1 Chapter introduction

As discussed in the methodology chapter of this thesis, the overarching epistemological position is one of an interpretivistic stance, with an ontological position focusing on constructivism, i.e. the actors within AFNs, rather than the AFNs as an objectivist 'organisation'. However, given the complex and multifaceted nature of examining AFNs, especially with the added dimension of the ever growing and important virtual presence of food reconnection, this extension to the methodology chapter is warranted as a separate chapter covering a quasi-quantitative approach, (see Bos & Owen, 2016).

In order to quantitatively demonstrate what the selected Alternative Food Network present in the Chester and its region looks like from a virtual perspective, SNA was selected as an appropriate tool. When graphically depicting the connectivity 'network', eigenvector centrality was used in combination with Node XL excel add-on to create a graph.

5.1.1 Objectives of the chapter

The objective of this chapter is to ultimately achieve Objective 2;

Explore AFN online practices by using Twitter as a social media platform from which to gain an understanding of sustainable development related content, and actor connections in general terms

The specific objectives of this chapter are to provide this thesis with a quantifiable and replicable account of what the Twitter network of AFNs of Chester and its region looks like in terms of connections, and content. Therefore, the chapter specific objectives were to conduct SNA in order to create a sociogram to graphically represent the network, and secondly, to explore some of the Twitter content of these users.

5.1.2 Structure of the chapter

This chapter covers the SNA and the content analysis of Twitter users within the AFN of Chester and its region. Initially, there is an introduction to social media in order to set the context of Twitter as an online platform for AFNs to use. Secondly, there is a definition of what SNA consists of along with the justification for selecting this data collection and interpretation method. This is followed by definitions of graph theory which are pertinent to SNA, chiefly the creation of a sociogram, and justifications for doing so.

The second part of the chapter is concerned with the findings of the SNA, whereby the sociogram of the centrality of relationships between Twitter users is presented and annotated. Then there is a brief examination of some key content presented by AFN actors in relation to SD related terminology. The chapter concludes with some limitations of SNA and content analysis, along with some practical considerations for further researchers when replicating this method.

5.2 Introducing virtual networks

5.2.1 Social Media

There are many social media platforms available to people and organisations, each specialising in separate niches, yet they often overlap in their utility, purpose, and exposure. For example Facebook, Twitter, Instagram, LinkedIn, Snapchat, WeChat and so on. These platforms come and go, some older platforms such as Myspace and Bebo no longer exist. However, social media as a concept and a place for connection to occur is almost certainly here to stay, and therefore its significance should be recognised. This being said, for now at least, it is arguably the case that the two main social media platforms currently used by both business and the general public are Twitter and Facebook.

Twitter has approximately 313 million monthly users (https://about.Twitter.com/company 2016), and it focuses on word-limited short comments, with pictures and video optional. Retweeting what others have said and/or liking posts is commonplace a strap line from Twitter's website states that; *"Twitter is what's happening in the world and what people are talking about right now"* (Source: https://about.Twitter.com/en_gb.html). Aside from personal tweets from individual Twitter users, it is often used by 'celebrities' (in the broadest sense of the word) and political and public figures, and many businesses and organisations use it to showcase (and market) their activities (Cawsey & Rowley, 2016). Facebook, has approximately 1.86 Billion monthly users (http://newsroom.fb.com/company-info/ 2016), a considerably higher amount than Twitter.

Facebook is a very similar social media platform to Twitter, however, there are no word limits to comments, and users can, therefore, engage in lengthier discussions and increase engagement on individual posts. Both platforms can enhance collaboration between consumers, business, and organisations, enable people to share content, develop their own network, and boost social interactions (Jansen, Zhang, Sobel, & Chowdury, 2009).

The utility of social media has some very clear advantages over traditional media outlets of information, for example; apart from organisations who wish to monetise their content in order to pay for adverts or direct more social media users to their page, social media is often free. Now for the first time in the history of our species, we have a truly global communications network that is accessible to anyone who has the know-how and access to the internet on an electronic device.

Given this research's interest in AFNs, it is no surprise that some of the activities of these networks take place online, virtually, and on social media platforms. The ever growing importance of digital networking technologies enables actors at all levels to have greater connectivity, thereby suppliers, customers, and retailers can easily communicate (Castells, 2011). As a result on the growing importance of the digital economy, the changing nature of business from the more conventional methods, such as purchasing from physical retailers, to an increase in online orientations, brings the AFN debates into a very contemporary setting, especially with regards to social media (Wills & Arundel, 2017).

Twitter, unlike Facebook, allows the researcher to quantifiably demonstrate which actors of a network are following each other, and at a basic search level, this can be exploited in order to demonstrate the connections that take place within a virtual network. With Facebook, for example, a user can see how many people 'like' the page, however, they cannot obtain a list of individual followers by name. Furthermore, a Facebook user could not see connections between other AFN actors for example, other than direct posts which refer to another AFN actor. Conversely, Twitter does have these functions available. A researcher can quantitatively obtain exactly who was 'following' and being 'followed' by who within a given network. As a data collection tool, this can be the basis of visualising what a virtual network looks like in terms of connections. It should be noted that connections alone do not give an indication of any relationships other than the basic act of actively 'following' or being 'followed' on the platform by a given actor. However, it is likely that Twitter users would follow other users who have similar or associated interests or are from the same geographical territory, and it is unlikely that a user would follow someone for no reason at all.

5.2.2 Graph Theory

Networks form a methodologically challenging object for research. Their characteristics such as a number of actors, connections, relationships, and structures mean that complexity is ever present. The two main characteristics of any network are 1. the actors involved; people, organisations, and their relationship either direct or indirect; and, 2. the interaction between these actors, and the ever-changing and evolving nature of them (Elo, Halinen, & Törnroos, 2010; Ford, Gadde, Håkansson, & Snehota, 2002). In order to help simplify what we mean by a network (in this research project's case an AFN), we will be using the graph and network theory in order to conduct a replicable SNA of the AFN that is present in Chester and its surrounding area.

The results of the SNA enable this research to quantifiably represent who are the key online organisations within this network in order to then select them as research participants for interviews. This approach has been undertaken in an attempt to ultimately give the research a more valid participant baseline from which to interview key organisations within the network. In doing so, it is envisaged that this approach to participant obtainment will enable future research to be conducted in order to obtain a similar class of research participant, and thereby make this research more replicable elsewhere. A network in the mathematical sense of the meaning is referred to as a graph, therefore graph theory is the overall language of how networks are represented. As indicated above, there are two characteristics of a network which are ever constant, and as a result, there are two parts to consider when referring to graphs in this network context; vertices and edges.

5.2.2.1 Vertices and Edges

Vertices, also referred to as 'nodes', apply directly to an entity that can be quantifiably measured; for example people, companies, places, hashtags, usernames, molecules and so on. This can extend further to include say, the more specific elements of an entity such as gender of people, type of company, and geographical location of a place.

Edges, also referred to as 'relations', are the relationships between two vertices. According to Von Germeten et al (2016) "*Edges may be weighted according to the statistical quantities of adjacent nodes, such as their centrality analysis measures*" p. 533. Relations can be tangible and physical connections such as the transportation infrastructure linking two cities, or DNA linking family members for example. Alternatively, there are intangible edges such as friendships, or followers on Twitter. Edges are also referred to as ties, connections, and links as well as relations in some contexts. All future references to vertices and edges will be referred to as; nodes and relations, respectively.

In order to aid the reader's understanding of which node or relation is being referred to, brackets will be used where appropriate; for example, nodes (food and drink companies), relations (retweets). The connections between nodes and relations are the endpoint, and where there are complex connections, a ‘multi-graph’ is formed, depicting multiple loops and connections.

5.2.2.2 Graphs

Graphs can be either directed or undirected in their orientation. An undirected graph can show a relationship between nodes that is mutual, this leads to unordered pairs of nodes that can be switched around, for example, three brothers are all each other’s brother and therefore it does not matter in which direction their connection is represented on a graph (if say only the ‘relation’ that was being observed was that they are all siblings for example).

In contrast to an undirected graph is the directed graph. Here we see a clear directional representation of the relations between the nodes. An example of this would be a graph showing the directional relations between nations who import cars. The exporting nations would have the arrow pointing away from themselves and towards the importer. These graphs are ordered, and logical, giving us an immediate impression of the state of a given topic of interest. However, to expand on this further, we can then, put the total amount of cars on our graph on the directional line with arrow correlating to the importing nation.

5.2.2.3 Social Network Analysis Indices

When conducting SNA, it is important to use measurement indices that enable a graphical representation of the network structure as well as the ability to then analyse this structure. Table 10 summarises some of the SNA indices that are available to the researcher to implement.

Indices	**Definition**
Size (N)	The number of nodes in the network.
Degree (d(n))	The number of relations that involve the specific node, only undirected graphs.
Density (D_n)	The proportion of all ties that are present in the network compared to those that could be present. It corresponds to: where $tot\ (n)$ is the total number of ties present in the network. Directed Network: $D_N = \frac{tot(n)}{N(N-1)}$ Undirected Network: $D_N = \frac{tot(n)}{(N(N-1)) \div 2}$
Geodesic Distance	The number of ties of the shortest path linking two nodes.
Degree Centrality	The normalised number of edges incident upon a node, corresponding to: $\frac{d\ (n)}{N-1}$
Closeness Centrality	The Normalised geodesic distance of a node from all the other nodes in the network.
Betweenness Centrality	The number of geodetic paths that pass through a given node, indicating the role of the connector of one actor for the others.
Centralization	The normalized distribution of degree centrality among all the nodes in the network.
Eigenvector Centrality	Weighted degree measure in which the centrality of a node is proportional to the sum of centralities of the nodes it is adjacent to. Intended as a measure of node importance in a network based on its connections.

Table 10 Social Network Analysis Indices (Borgatti and Everett 1997 cited in Pisani & Burighel 2014 page 254)

By Using SNA software, the indices presented in table 10 can be calculated automatically and as a result, some equations are not easily accessible. Borgatti and Everett (1997) present a working example of SNA using equations specifically created for the example provided, yet they too also use SNA software UCINET.

5.3 SNA and Sociogram protocol

This section covers a step-by-step guide on how to collect, and accurately record the Twitter Network of connections in order to generate a sociogram using NodeXL. The NodeXL software can also be replaced with another program, as the method of recording the data collection in Microsoft Excel will still be applicable and transferable to any SNA programme, for example, Gephi, Pajek, and UCINET, which can enable the user to analyse social network data. The list of inclusion and exclusion criteria for selecting Twitter users of Chester and its region's AFN is shown below, such a list was created in order to act as a scope and inform future researchers of the procedures taken.

5.3.1 Inclusion and Exclusion criteria for SNA

Inclusion criteria

1. An organisation or company associated with the food sector which was based in or close to Chester (e.g. café, bar, restaurant, food and drink company, associate and institutional framework actors such as government departments, food and drink manufacturers and processors, and producers, all within Cheshire or North Wales as Chester city borders North Wales);
2. Twitter users needed to be 'followed by' and or 'following' at least one or more other Twitter users in the AFN to be included;
3. Exceptions to the geographical and industrial (food sector) boundaries were given to actors who repeatedly followed or were followed by a number of actors in the network, thereby limiting any potential geographical biases and preventing any key actors from being left out.

Exclusion criteria

1. An organisation or company who does not meet the inclusion criterion 1;
2. Individual or consumer Twitter accounts. It was noted that several consumers, food bloggers, public figures, and general Twitter users followed a number of food companies, however, as this study is concerned with the perception of actors in terms of organisations within this AFN, these individuals were not collected and added to the group. Further research into this AFN could change this exclusion criterion to inclusion criterion without any difficulties and collate this extra data accordingly.

Although the inclusion and exclusion criteria can be seen as subjective to individual researchers, broadly speaking it does add a degree of control to this complex issue of deciding which actors should be selected or not. This being said, a more rigorous set of criteria could be developed if implementing this SNA on a much larger scale was required.

5.3.2 Scoping the Twitter Network

The researcher started with a single food sector company known to operate in Chester. By looking at their Twitter page and obtain a list of their 'followers' and 'following', the snowballing sampling strategy enabled a quantifiable representation of the AFN in Chester and its region to be understood. The print-screen shown in Figure 10 represents an example of how the data was recorded using a spreadsheet (See Appendix 8 for complete data set).

	49 Watergate	Applegates Farm Shop	Artichoke	At the Hollows
49 Watergate	0	0	1	0
Applegates Farm Shop	0	0	0	0
Artichoke	1	0	0	1
At the Hollows	0	0	0	0

Figure 10 print Screen example of data presented in Appendix 8 A twitter 'followers and' following'

The list of Twitter followers and following, from now on referred to as the 'Twitter connections', was collated, in a systematic way using binary coding, entering either a '1' into the cell that related to the actor who was 'following' the initial actor, or '0' if they were not being followed by that actor. In order to export the Microsoft Excel spreadsheet into NodeXL, both the columns and rows axes needed to be alphabetised, this way the software package could analyse the data set and create a sociogram. Furthermore, a directional graph could be produced, given the two-way relationship involved with Twitter connections.

For example, the third row shows 'Artichoke' who is following '49 Watergate', therefore a '1' was entered into the cell (the fill colour of the cell in blue is for clarity), whereas they were not following 'Applegates farm shop', therefore a '0' was entered. Once this initial Twitter user's list of 'followers' was collated and recorded on the spreadsheet, all of the Twitter users who met the inclusion criteria for selection underwent the same process.

This process at the beginning was time-consuming as each Twitter username had to be copied and pasted into both the rows and columns of the graph, and the cells would then need to be recorded with either a 1 or 0. This being said, the process was necessary given the nature of the inclusion and exclusion criteria applicable to this study.

There was an option with the software package 'TwitterR' to download a list of followers and following from a Twitter user, however, they would not be presented in a way necessary for graph theory and SNA to occur. The researcher would still have to manually enter either a 1 or 0 into each cell and plot the actor names in the rows and columns of a spreadsheet. The repetitive nature of this manual method was time-consuming, however, with practice, the 'sifting' process did quicken, especially as fewer new actors were included. The scope for conducting this level of data-mining, whereby data is 'extracted' from an online source by systematically 'sifting' through Twitter user's profiles, had no initial quantity limits. It was envisaged that there would be a saturation period where no new Twitter users would be identified in the region, however, no number was attached to this due to the exploratory and innovative research methodology. It should be noted that, according to the knowledge of the researcher at the time of writing this thesis, this method has not been applied when directly attempting to quantify a given virtual AFN. Therefore, this method of participant selection for interview and content analysis should be viewed tentatively as a contribution to knowledge.

5.3.3 Grouping

Once the above step had been conducted the selected Twitter users were then classified into 'clusters' of AFN types;

- **Food and Drink Companies (code: FDC)**: companies who process, produce and/or manufacture the food and drink that is present in the AFN;
- **Restaurants, Café, Pubs, and Bars (RC or PB):** these can be defined as eateries in the broadest sense of the term. Locations in Chester and the surrounding area where food and drink is consumed in the AFN;
- **Retailer Specialist shops, Farm Shops, Farmers Markets (RFS, RSS, or RFM):** Broadly defined as retailers of the food and drink present in the AFN (retailing both to consumers and other businesses);
- **Association Frameworks (AF):** relational entities that exist in order to market the AFN, help establish connections, engagements, and exchanges between organisations and consumers within the AFN;
- **Institutional Frameworks (IF):** Regional development and local authority actors who are related to the AFN.

Following this step, all Twitter users were assigned a participant code in order to preserve anonymity. Although the information collected from Twitter was in the public domain, such as usernames and comments, because the interview participants were selected from this list it was felt that it would be appropriate and ethically prudent to extend the same level of anonymity to all actors within the AFN.

For example, a food and drink company which was 60th to be logged, the Twitter user would be coded as; FDC60. Furthermore, if only the interview participants were anonymised and not the remainder of actors within the AFN, it may have been problematic when cross-referencing actors, especially when discussing commercially sensitive views from the interviews in relation to others who may be in the Twitter AFN. Finally, as individual company and organisational names were not deemed to be a necessity to the success of this research, it was not envisaged that there would be any drawbacks to extending this anonymity to all actors mentioned in the study.

5.3.4 Exporting data set to software package

In order to correctly use the NodeXL add-in function with Microsoft Excel, a new blank NodeXL template is a requirement. With a blank NodeXL template open, the Twitter connections data can be imported and as a result, a complete list of relations (Excel sheet named as 'edges' by default) can be presented. Furthermore, all nodes (named 'vertices' by default) are listed with the SNA Indices automatically calculated. An example of this is shown in Figure 9 (see p. 106).

In order to create the sociogram the functional settings were available for alteration:

Graph layout: Harel-Koren Fast Multiscale; this graph layout was selected as the graph enables simple visualisation of clustered and individual groups of actors. The graph uses an algorithm built into the software package to form the sociogram. It is particularly useful when dealing with clusters of nodes, in this case, the types of AFN actors, as shown in the different colours on the graph.

Directed: Directed graph was selected as each relation is different, and therefore each 'arrow' depicting the connection (shown in light blue colour in the final sociogram) is a separate relation, even if going between the same actors, see Figure 12. An undirected graph would be applicable when this was not the case. On Facebook, for example, users add each other as a friend, thereby creating an undirected relationship as they are both now connected, see Figure 11.

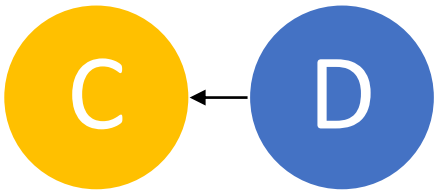


Figure 12 Directed relation between two nodes on Twitter, 'D' is following 'C'

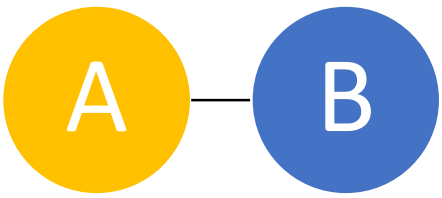


Figure 11 Undirected relation between two nodes on Facebook, 'A' and 'B' are jointly connected rather than one following the other

Visual Properties: The user can manipulate the spacing of the nodes on the graph, change the colours of nodes and relations, along with the 'shape', 'label', and 'size' of the nodes on the sociogram;

Graph Metrics: This tab on NodeXL enables the socio-gram to be constructed according to a given metric. The SNA Indices (such as; degree and eigenvector centrality) can be used in conjunction with the visual properties settings in order to create a sociogram which is easy to interpret with basic annotation.

5.4 Chester Sociogram and SNA

There are many other actors within the research area who have been excluded from the data collection process, and it would be unrealistic and somewhat overambitious for an individual researcher to obtain such a large amount of in-depth data on such a large research area (in terms of potential food actors in a relational rather than Cartesian space) given the time constraints of this research project. Rather the compiled sociogram is a snapshot of Twitter users who are connected together via this specific social media platform, under the inclusion and exclusion criteria outlined.

5.4.1 Chester SNA results

In total, 109 separate actors were listed as being connected on Twitter, there were a total of 3,120 relations which were collated from 09/01/2017 to 27/03/2017.

Therefore the SNA index; Size (N) = 109

When examining the density of a social network, an important interpretation of the social network can be understood. By quantitatively calculating the density of a social network, an objective interpretation of connections can be acquired and analysed (Borgatti & Everett, 1997).

The following equation, shown in Figure 13, was used in order to calculate the density of the Chester AFN;

$$D_N = \frac{tot(n)}{N(N-1) \div 2}$$
$$D_N = \frac{3120}{11772}$$
$$0.265 = \frac{3120}{11772}$$

Figure 13 Equation AFN Density measurement index

The network density index uses the above equation which in basic terms is a ratio between an actual number of relations (numerator), and potential number of relations (denominator), ultimately showing how 'full' or 'dense' the network is in terms of relations. If a network was full of relations then the density number would be '1', however, a network where there were no ties would be expressed as '0'.

As we can see from the equation above, the network density $D_N = 0.265$ which shows a density of approximately; $\frac{27}{100}$ therefore $\frac{73}{100}$ of Twitter users in this network do not have a directed relationship with each other. This suggests that the AFN Twitter Network is not particularly well connected. Table 11 shows the density for all AFN cluster types, and as a result we can see that there is no one cluster type that is over half connected with each other in this network.

AFN Cluster Type	Density equation	Ratio
Food and Drink Companies (FDC)	$0.23 = \frac{291}{1260}$	$\frac{23}{100}$
Restaurants, Café, Pubs and Bars (RC or PB)	$0.43 = \frac{767}{1806}$	$\frac{43}{100}$
Retailer Specialist shops, Farm Shops, farmers markets (RFS, RSS, or RFM)	$0.24 = \frac{38}{157}$	$\frac{24}{100}$
Association Frameworks (AF)	$0.39 = \frac{60}{156}$	$\frac{39}{100}$
Institutional Frameworks (IF)	$0.20 = \frac{1}{5}$	$\frac{20}{100}$
All AFN twitter users	$0.265 = \frac{3120}{11772}$	$\frac{27}{100}$

Table 11 AFN Cluster Type

As a result of calculating the density of this network, we can clearly see that the network is not particularly well connected in terms of potential relations versus actual relations. This can be interpreted in several ways, on the one hand, this low density may suggest that connections on Twitter are a somewhat meaningful statement of a relationship. Also, that actors do not necessarily follow just any Twitter user just because for example, they are also located in the same geographical area, or just because a Twitter user shares mutual ties with other actors. A further consideration is that Twitter as a social media platform may not be suitable or fit-for-purpose for these specific businesses they may be using other platforms, for example.

On the other hand, it may be the case that the selected actors are more commercially orientated and consumer-facing rather than business-to-business. If this is the case then it is not surprising that there is not a high level of density, especially within clusters where they may not wish to follow their competitors for example. This, of course, is not the full range of explanations or possibilities, however, it raises the complexities surrounding the individual differences when it comes to Twitter users.

A possible assertion when it comes to Twitter connections is that Twitter users do not necessarily have to follow one another in order to have a coordinated connection. It may be the case that following a key actor in the network who has a high level of centrality, or by using or following a particular 'hashtag', sufficient knowledge or cohesion can be achieved.

However, having said this, in Hawe, Webster, and Shiell (2004) it is highlighted that some actors intentionally stay on the periphery of such networks by only having relations with a specific set of actors, and that they still "*are able to influence the direction the network takes entirely because of their size, reputation, or through the power of sanctions"* p. 974. Therefore, just because an actor within a given network is on the periphery, or has a low level of centrality, it does not mean that they cannot influence the network in some way, or receive or disseminate information to others within the network.

One of the purposes of following another Twitter user is to have their posts appear on your news feed and thereby be updated on their post content and actions. Actors who have high centrality within a network themselves may be a key actor in terms of information getting to and from them. Therefore, having a high level of centrality would potentially mean that an individual Twitter user would be well positioned in a network. In a non-virtual setting this would be easy to conceptualise. For example, a new academic member of staff in a large faculty Christmas party might have a high level of centrality at the event because a lot of people want to introduce themselves to her and as a result she would establish high levels of relations, albeit they may only be short introductions. In a virtual setting, it may be the case that certain Twitter users just follow other users simply because they are a new organisation in the area, or they are gathering commercial information on them. There could be many Twitter users who follow a given network and in turn receive a follow from that user, thereby increasing the centrality of a node. In order to analyse beyond centrality and density of a given node in a network, in this case, a Twitter actor in the Chester AFN, SNA can calculate their individual eigenvector centrality. The eigenvector centrality score calculates if the connections made in the network are with Twitter users who are also highly central to the network, and not just many actors on the periphery. Some periphery actors may not be the influential selective types, but rather some of these less connected and less central actors may be in that position because they do not share the same characteristics as the majority of others in the network. Therefore in order to gain a higher eigenvector centrality measure, a Twitter user will need to have relations with key Twitter users who themselves also have connections with other central actors, ultimately measuring the importance of the initial Twitter user in terms of connections in a network.

As a result of using NodeXL SNA software to calculate the eigenvector centrality measurements of all the nodes in this network, Figure 14 was created.

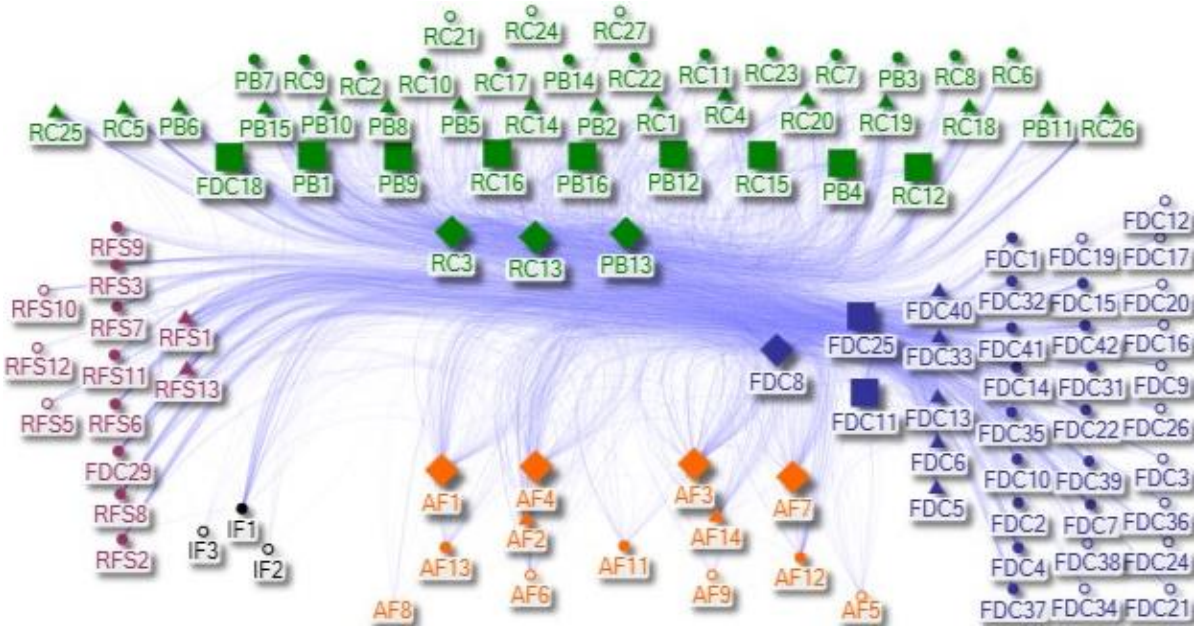


Figure 14 Sociogram to show eigenvector centrality of each node with the AFN

The sociogram is annotated in the following way; the graph represents AFN Twitter users who have the relation of being connected to other Twitter users as selected by the inclusion criteria. The graph shows two-way relations between actors, which accounts for 'followers', and 'following' of each of the nodes in the network.

Each blue line on the graph represents these relations, and they are a somewhat curved shape in order to help visualise the relationship based on AFN type. Unfortunately, due to a large number of nodes in this graph, the arrows are not visible. Furthermore, FDC29 and FEC18 were placed in placed separate AFN types from the other FDC as they both retailed their own produce and therefore were categorised accordingly. The actors are colour coded in their respective AFN grouping types, with their individual anonymised codes used as labels. The nodes are represented on the graph in relation to their individual eigenvector centrality measurement. The nodes with the diamond shapes above their label are actors with the highest eigenvector score, followed by squares which have a lower score, then triangles, circles, and finally the actors with the lowest measurement are represented with a clear disc. The graph's original layout on NodeXL was altered slightly in order for labels to read and for a clear distinction between the AFN grouping types.

When further analysing the sociogram, and by paying attention to actors at the periphery of the graph, we can see that they outnumber those who are in the centre of the graph. This visual representation fits with the calculations of the density of the network. At first glance of the graph there appear to be many connections (3,120), however, as outlined earlier this is only approximately 27% of the total connections.

The Institutional Framework Twitter users appear to be the least connected. In fact, IF3, the Chamber of Commerce who represented much of the territory of the AFN, were not following any of their members within the Network, and they had the fourth lowest eigenvector centrality measurement. However, this may have been because few of their members were on Twitter. Furthermore, IF2, the Local Enterprise Partnership for the territory of the AFN, had the lowest eigenvector centrality measurement. This suggests that out of all actors in the network, they were the least connected, and also had the fewest amount of relations to Twitter users who were central. Therefore, it would appear that perhaps they are an example of periphery actors as described by Hawe et al. (2004), who have a low connectivity in the network, although they are influential because this organisation is responsible for determining economic priorities within the territorial area. IF1, a regional food and drink science and technology centre, had a higher eigenvector centrality score, however, they were following 40 and were followed by 43 Twitter users from the AFN and had clear food sector expertise compared with the other two IFs.

It should be noted that the sociogram does not show a Cartesian, or mapped, network in terms of physical connections, the layout of the sociogram depicts a relational map. Future research could develop upon this relationship map (sociogram) by way of using postcodes and plotting points on an electronic map (such as available via https://digimap.edina.ac.uk/). This could be used in conjunction with the sociogram to see if there was any correlation between physical proximity of actors and connections on Twitter.

5.5 Content Analysis

As previously outlined in the Methodology Chapter, in section 4.3.2.2 Content Analysis, it was indicated that NCapture software would be used in order to collect Tweets from the selected Twitter users from the identified AFN. After downloading NCapture as an Extension to a web browser (Google Chrome for example) a Twitter user's home timeline was opened in a browser then the 'Capture for Nvivo' icon at the top of the browser could be selected enabling tweets to be downloaded as a dataset. Once the tweets were 'captured' using this method, each Twitter user's tweets dataset would then be 'imported' into NVivo 11 for content analysis.

It should be noted that NCapture has some limitations as the tweet dataset of a given Twitter user may not have included every tweet from that account. It was noted on NCapture's help webpage that:

> *The number of Tweets that you can capture is determined by Twitter. The exact number may vary depending on the:*
>
> *Number of Tweets available.*
> *Amount of traffic on Twitter.*
>
> *If you want to follow a particular topic over time, you may need to take multiple captures at periodic intervals*. (NCapture-help, 2017).

This being said, a representative number of tweets was obtained from all Twitter user accounts; over 3000 for many accounts. However, some accounts were newer than others and therefore had fewer tweets available. An alternative method to using NCapture would be that each individual tweet from 109 Twitter accounts would need to be manually downloaded and entered into a spreadsheet, which would prove unpractical for a single researcher with a limited project time frame.

In total, all 109 Twitter users' tweet data was analysed in Nvivo 11, and it was all collected on 27/03/2017 between 16:29 and 21:38. The time taken highlights the speed in which large amounts of tweets could be downloaded one Twitter user at a time.

5.5.1 Sustainable Development related text search and word frequency results

In order to explore some of the content relating to the SD agenda, a list of text searches and word frequency queries were performed. This stage was conducted in order to ascertain the extent of SD-related content that was posted on social media by all Twitter users within the AFN network. Table 12 shows SD related terms, including a tally of references by way of Tweets per user.

The top three Twitter users were selected from all participants along with the frequency of references. The SD terms were subjectively selected by the researcher on the basis of commonly associated words in SD and AFN literature including the sustainable food criteria as shown in table 12. The Table does not, of course, explore the specific content of the Tweets and the list of terms is by no means exhaustive or comprehensive. However, the purpose is to explore if there are any basic trends relating to AFN grouping types or individual Twitter users.

SD term	Most Frequent users of terms					
	1st		2nd		3rd	
Community	RC15 (city centre café)	42	FDC15 (tea producers)	29	IF3 (business support)	28
Environment	FDC26 (fish mongers)	29	IF2 (development body)	7	AF1 (online retail coop)	5
Ethical	FDC3 (milk producers)	42	AF1 (online retail coop)	27	FDC26 (fish mongers)	10
Fair	FDC3 (milk producers)	62	FDC26 (fish mongers)	55	PB9 (village pub)	37
Fair-trade	FDC3 (milk producers)	9	RFS7 (rural farm shop)	3	PB12 (village pub)	1
Farmer	AF1 (online retail coop)	69	FDC3 (milk producers)	33	FDC33 (Butcher)	24
Food-miles	AF7 (Food marketer)	4	RFS7 (farm shop)	3	FDC2 (Coffee producers)	2
Free-range	AF9 (food wholesaler)	35	FDC26 (fish mongers)	33	RFS2 (farm shop)	28
Gluten-free	FDC17 (cake maker)	53	RC15 (city centre café)	46	RFS4 (farm shop)	21
Grass-fed	AF1 (online retail coop)	11	AF6 (online retail coop)	7	FDC38 (egg producer)	3
Health	FDC3 (milk producers)	28	FDC7 (honey producer)	26	IF3 (business support)	13
Healthy	FDC3 (milk producers)	54	AF6 (online retail coop)	36	AF9 (food wholesaler)	34
Independent	FDC3 (milk producers)	71	RC26 (coffee shop)	51	RC1 (coffee shop)	28
Local	AF6 (online retail coop)	447	AF1 (online retail coop)	407	RFS7 (farm shop)	402
Locally	RFS7 (farm shop)	98	PB12 (village pub)	69	RFS3 (farm shop)	39
Organic	AF1 (online retail coop)	93	AF6 (online retail coop)	64	AF9 (food wholesaler)	37
Recycling	FDC7 (honey producer)	6	RC16 (restaurant)	2	IF3 (business support)	2
Seasonal	AF1 (online retail coop)	25	RFS7 (farm shop)	23	PB6 (city pub)	17
Support-local	RC15 (city centre café)	78	RFS7 (farm shop)	30	AF6 (online retail coop)	27
Sustainability	FDC3 (milk producers)	82	FDC26 (fish mongers)	17	AF1 (online retail coop)	12
Vegan	PB13 (city restaurant)	24	PB16 (city restaurant)	24	RC15 (city centre café)	22
Waste	RC10 (Community Café)	25	AF1 (online retail coop)	14	AF6 (online retail coop)	9
Frequently 1st, 2nd, 3rd:	FDC3 = 7		RFS7 = 4		AF1, AF6, AF9, and IF3 = 2	
Most prolific:	AF1 = 9 (FDC3 = 8, RFS7 = 6, AF6 = 6, FDC26 = 5)					
Most SD tweets (-local*):	AF1 = 406 (FDC3 = 349, RFS7 = 330, AF6 = 270) 'Local' was not included as this term's frequency was much larger than others and would produce the following result; AF1 = 813 (RFS7 = 732, AF6 = 716, FDC3 = 349)					

Table 12 SD text query frequency by Twitter user

As Table 12 shows, the Twitter user who has most frequently tweeted the largest number of SD-related terms on Twitter is AF1, the online retail cooperative which specialises in providing a platform for locally-based food and drink companies to retail their produce, whilst ensuring that all revenue goes to the producer and not the intermediate (in this case AF1 is the intermediate). The Twitter user most frequently '1st' in terms of frequency of Tweets per SD trend was FDC3, the sustainable milk producers. Furthermore, they are second when it comes to being listed in the top three most frequent users of SD terms overall, thereby suggesting that their attention to the SD agenda, along with AF1, was significant in relation to all other Twitter users in the AFN.

During the discussion and analysis chapter (see Chapter 6), pertinent tweets which help support or contradict a given statement were provided. This not only provides independent verification of any statements, but it also helps to conceptualise some interrelations within the AFN, such as endorsements, and retweets.

5.5.1.1 Word Frequency results

An NVivo 11 word frequency query displaying the 100 most frequent words with a minimum length of three letters was conducted to examine frequently used words in tweets. Many conjunctions, correlative conjunctions, and subordinating conjunctions were removed, along with seemingly non-relevant words (such as; https, http, day, coming, Monday, book, looking, year, need, still, pop, got, new) Any Twitter users who were identified were added to 'stop words' and discounted. However, the results of this activity did not seem to add value to the SNA, other than to say that 'local' was the only SD term in the top ten. The others included references to the territory or food-related terms that served little purpose such as coffee, beer, cheese, market, Cheshire, Chester etc… One could argue that territory was an important facet of tweets, although this would be common sense, and references to food and drink products are what you might expect from Twitter users in the food sector.

5.6 Actors selected for interview

The purpose of conducting the SNA and creating the sociogram to show the virtual embeddedness of the AFN of Chester and its region was twofold; firstly this was done in order to gain an understanding of the connectivity and density of this network, whilst also examining the content that was available in this network, and secondly to gain suitable interview participants in order to conduct further enquiry.

As a result of conducting the SNA, this thesis has gained a preliminary understanding as to the virtual connectivity and density of the selected AFN, albeit using basic SNA indices and measurements associated with graph theory. On the basis of this analysis, actors were selected to be interviewed based on the need to gain a deeper understanding of this particular AFN in relation to both the academic literature and the highlighted gaps in the research knowledge on this subject, whilst also to help better inform the debates around virtual embeddedness of AFNs on Twitter. There were clear limitations to the SNA including the lack of ability to ask further questions and critically enquire more about the actor and the relations present in this network.

When deciding on participant selection for interviews, ideally the interview participants would be a mixture of central and peripheral actors, from all AFN group types if possible. By taking this into consideration and also interviewing those who demonstrated high or low levels of SD related content via their Tweets, participants would be likely to be fit-for-purpose given the research aim of this thesis;

> *To investigate the role played by online (social media) connections as a means to enhance the understanding of alternative food networks in the context of sustainable development.*

As the network had a total of 109 actors, it was deemed appropriate, given the context of this thesis, to select approximately 10% of this number, which was rounded up to 11 participants for interviews. However, it was difficult to obtain participants, many companies and organisations did not respond to email and follow up emails, some organisations ceased to exist, others responded stating that they did not want to take part in the study, some said that it was not a convenient time, and some participants agreed to be interviewed but did not follow through with their agreement. The researcher repeatedly contacted several organisations who were considered to be suitable, to the extent of visiting premises, making phone calls, and even through private Twitter messages. As a result of this setback, this thesis was only able to obtain nine interviews.

If this study were to be conducted again, the possibility of incentivising the interviews may have been a way of obtaining more participants, or by being embedded within another organisation other than a University, for example, IF1, the regional food and drink science and technology centre.

Ultimately, the participants listed in Table 13, which shows some pertinent individual SNA index measurements, were interviewed.

Vertex Code	In-Degree (Followers)	Out-Degree (following)	Betweenness centrality	Eigenvector Centrality (EC)	EC position out of 109 nodes
AF1	55	63	0.52	0.15	8
RC15	44	49	0.37	0.14	15
RFS1	42	50	0.18	0.11	40
FDC7	44	39	0.24	0.10	50
FDC35	19	33	0.11	0.08	60
FDC9	15	13	0.01	0.06	89
FDC3	13	12	0.006	0.03	99
IF3	9	0	0.005	0.02	106
IF2	5	3	0.002	0.02	109

Table 13 Interview Participant SNA Index measurements

5.6.1 Sustainable Food Criteria

Prior to the content analysis of SD terms, the Sustainable Food Criteria was used as a framework in order to focus SD related terms and in doing so identify some of the sustainability characteristics present in the network. The sustainable food criteria, acquired from www.sustainweb.org, the alliance for better food and farming, has been used by scholars in previous studies (see Ilbery & Maye, 2005b). The framework provides this thesis with a list of sustainable food criteria and helps provide an indication of a given actors' characteristics in this context. By analysing Tweets and content on individual web pages where needed, either a 'tick', 'cross', or 'N/A' (not applicable) was assigned quasi-subjectively to each actor and presented in Table 14.

Sustainable food criteria	AFN Twitter users selected for interview								
	RFS1	**FDC7**	**FDC35**	**FDC3**	**FDC9**	**RC15**	**AF1**	**IF2**	**IF3**
1. **Proximity** originating from the closest practicable source or the minimization of energy use;	✓	✓	✓	✓	×	✓	✓	N/A	N/A
2. **Healthy** part of a balanced diet and not containing harmful biological or chemical contaminants;	✓	✓	✓	✓	✓	✓	✓	N/A	N/A
3. **Fairly or co-operatively traded:** between producers, processors, retailers and consumers;	✓	✓	✓	✓	×	✓	✓	N/A	N/A
4. **Non-exploiting** of employees in the food sector in terms of rights, pay and conditions;	✓	✓	✓	×	✓	✓	✓	N/A	N/A
5. **Environmentally beneficial** or benign in its production (e.g. organic);	✓	✓	✓	✓	×	✓	✓	N/A	N/A
6. **Accessible** both in terms of geographic access and affordability;	×	×	✓	×	✓	✓	✓	N/A	N/A
7. **High animal welfare** standards in both production and transport;	✓	✓	N/A	✓	N/A	✓	✓	N/A	N/A
8. **Socially inclusive** of all people in society;	×	✓	✓	✓	✓	✓	✓	N/A	N/A
9. **Encouraging knowledge and understanding** of food and food culture.	✓	✓	✓	✓	×	✓	✓	N/A	N/A
Scores	**7**	**8**	**8**	**7**	**4**	**9**	**9**	Not Scored	

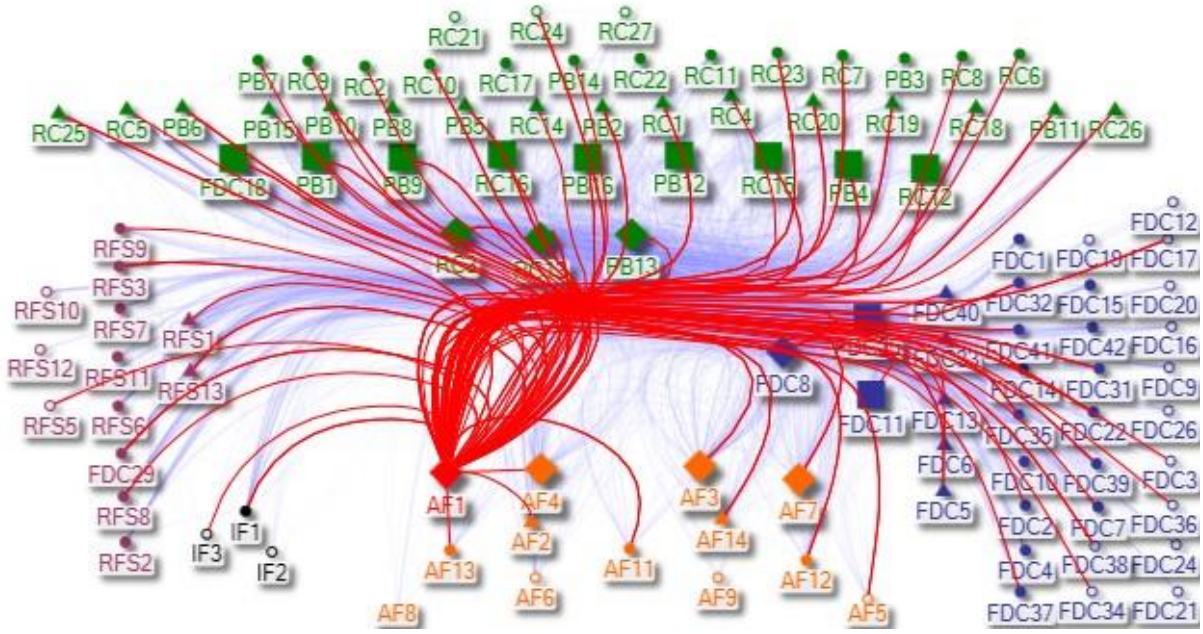
Table 14 Sustainable food criteria

As Table 14 shows, many of the sustainable food criteria are met by most of the AFN actors selected for an interview. The only actor who scored relatively low compared to the others was FDC9, the preservatives manufacturer. The results of the sustainable food criteria toolkit helped this research to develop a scope of reference with regards to this particular AFN. Furthermore, this level of enquiry acts as a contemporary aid to the traditional 'thick' description as advised by Geertz (1973) and Lincoln & Guba (1985), which was explained in the research design section of the methodology chapter. In doing so, the results of the criteria toolkit serve as a good benchmark upon which to frame discussions regarding the interview participants. IF2 and IF3 were not scored as they are institutional framework actors. They were included as they were perceived to be important organisations in the local area from a business support perspective.

5.6.2 Actor synopsis

In addition to the measurements provided in Table 13 and the sustainable food criteria shown in Table 14; the following synopsis of each actor presents nine sociograms showing the same eigenvector centrality measurement layout, however, each node is selected and their relations are highlighted in red. The sociogram serves as a visual interpretation of the relations between the interview participants and others in the AFN. Below is a brief synopsis of each individual participant, which includes references to each individual sociogram, and some knowledge gained as a result of the content analysis of their tweets as well as verifications of such comments from their websites, if applicable.

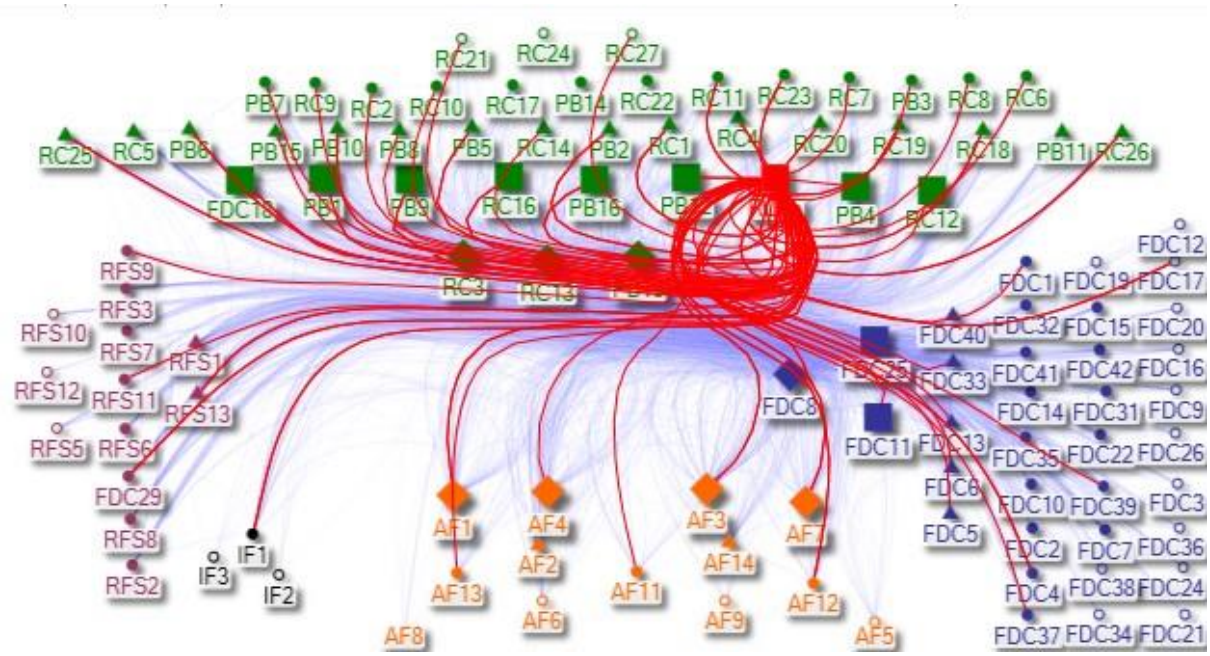
5.6.2.1 AF1 online retail cooperative



This Twitter user has one of the highest eigenvector centrality measurements, and is ranked 8th in terms of overall centrality in this network. They are well placed in the network to receive and disseminate information, and given their prevalence on the SD term frequency table, this is a noteworthy position to be in. Analysing 783 SD related term Tweets revealed a consistent and long-standing engagement with the agenda, notably promoting local, sustainable, ethical produce. As an association framework, this organisation is an online retailer of local producers who operate on a 'click-and-collect' service in collaboration with a local pub. Customers are aware that this organisation is an intermediate in the supply chain. However, AF1 receives only a small annual membership to help support the website and all money goes to the grower or producer of the product.

A basic count of Twitter users from this network who retailed their produce through AF1 totalled at eight (FDC2, FDC5, FDC6, FDC30 FDC34, FDC35, FDC38, RFS12). Looking at their Betweenness centrality measurement, a little over half of all actors in the network are connected to this actor, thereby indicating a significant role as a connector of one actor for the others. Their individual sociogram shows a visually compelling account of connectivity given the broad-ranging nature of their relations with other actors in the network.

5.6.2.2 RC15 City Centre independent Café

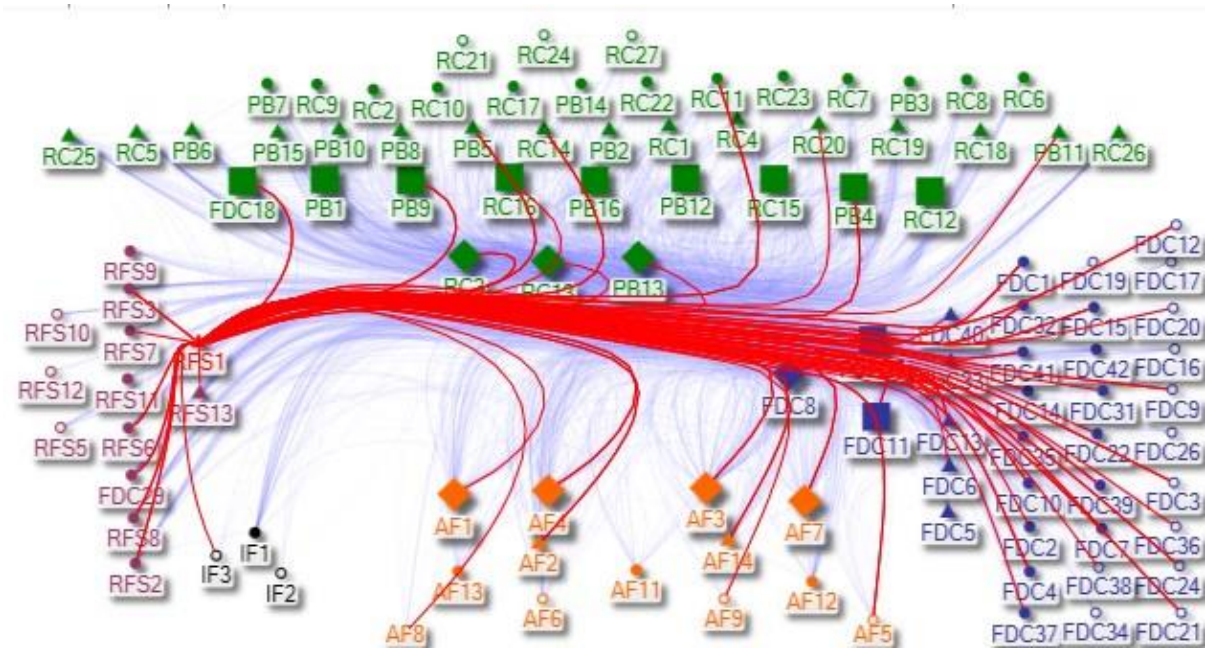


Much like AF1, this actor has one of the highest eigenvector centrality score, ranked 15th. This independently owned city centre café boasts a mixture of local alternative foods on their menu, including in-house production, as well as some conventional food products such as branded drinks and condiments.

They promote social enterprise initiatives by way of employing staff from the local further education establishment as a way of providing non/low-skilled students their first taste of work. The café produces their own gluten-free range, is involved in local philanthropy and charity. Their Betweenness centrality lower is slightly less than AF1, however, they are still well placed in terms of being a connector of actors within this network.

Their sociogram shows that they have more relations with other eateries and retailers of food than with the food and drink companies; this may suggest a level of biases in terms of Twitter connections. It may just be that they do not have Twitter connections with food and drink companies that they have no offline relation with. When analysing 431 Tweets with SD related terms included, it is clear that they support local producers and eateries, and that they frequently retweet and tag other Twitter users in their area. Gluten-free produce at this café is a regular feature, along with supporting the community and local independent businesses.

5.6.2.3 RFS1 high-quality farm shop

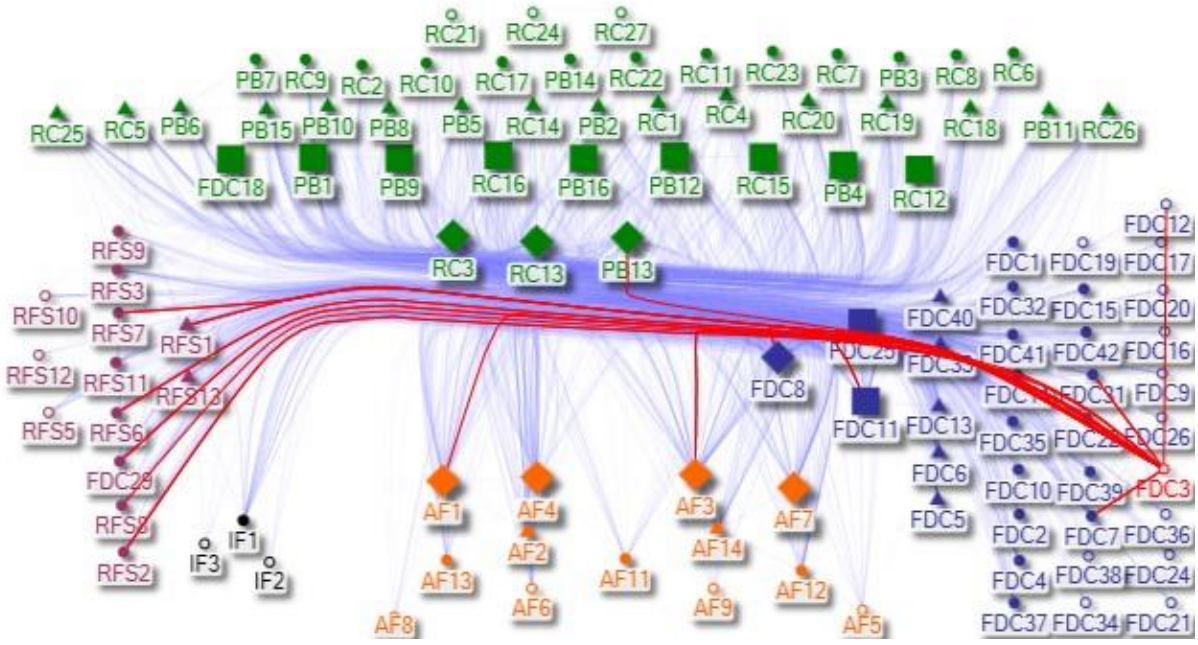


This specialist farm shop, based in a village outside of Chester specialises in high quality local, national, and international produce, with an emphasis on transparency of their supply chain, as well as promoting ethical and fair trade.

They have a similar amount of relations to the previous two actors in the network, however, their eigenvector centrality score is lower, which suggests that they are not connected to as many other centralised actors in the network as they possibly could be. Their Betweenness centrality measurement is lower than FDC7, which suggests that even though they have a higher eigenvector centrality, they are still not placed in as good a position of centrality between actors as they could be.

Taking into account their individual sociogram, it is clear that they have more Twitter connections with food and drink companies, and other farm shops, rather than bars, restaurants, cafes, and pubs in the network. This may be somewhat expected given the farm shop may stock products from the network. A preliminary count of products stocked in the farm shop from other AFN members totalled 18 (FDC; 1, 3 4, 7, 8, 9, 10, 11, 12, 18, 20, 24, 25, 28, 32, 39, 41; and RFS3). Viewing 115 of their Tweets which related to SD terms, many tweets were promoting local suppliers and promoting healthy balanced diets. Seasonality of produce was also a prevalent SD term used.

5.6.2.4 FDC3 Milk Producer

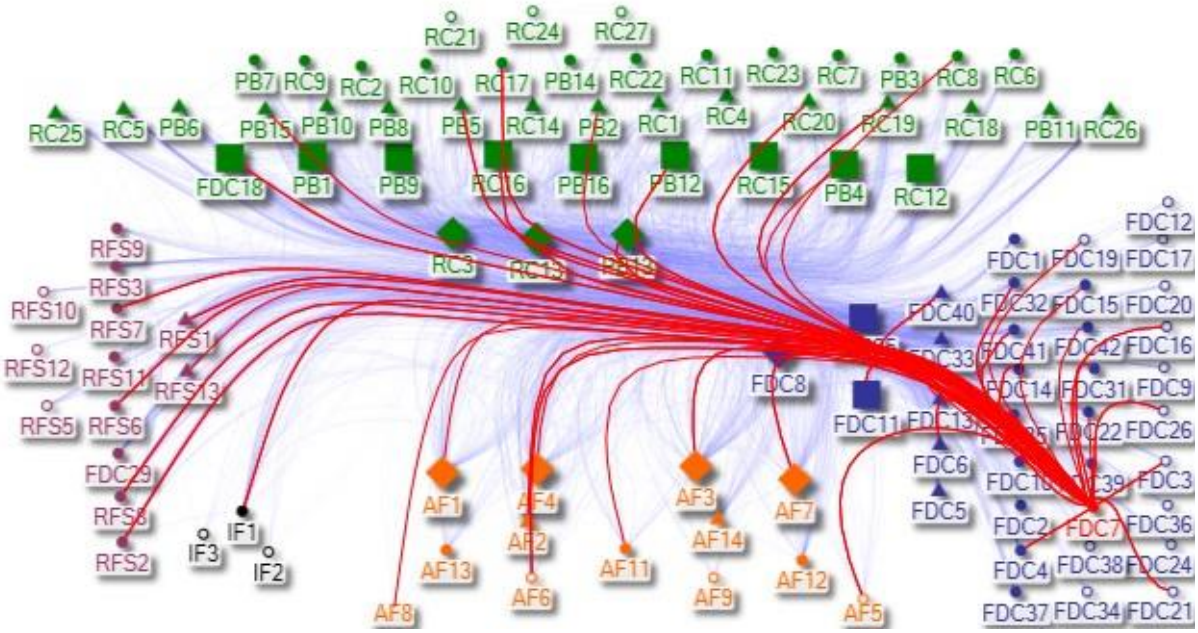


This company produces dairy products which are marketed as a health benefit product as they contain natural selenium. This is achieved by sourcing milk from their suppliers who are part of their own healthy herd programme which monitors cows and the farming practices implemented by the farmers. Much like FDC9, this company is one least connected to food and drink companies in terms of eigenvector centrality and Betweenness centrality measurements. They have very few relations with other actors who are central to this network and, as a result, they are a periphery company.

They have relations with several specialist retail shops, farm shops, and FMs, thereby much like FDC9, indicating their route to market within this network. Interestingly they are only followed by one pub/ bar in the network, which is PB13 (Mediterranean style bar-restaurant).

Furthermore, they have relations with the following food and drink companies; FDC11 (farm shop who produce their own produce), FDC12 (cake producer), FDC31 (coffee producer), FDC7 (honey producer). When viewing their sociogram, a clear visual representation of Twitter connections is evident. This being said, with the amount of SD-related Terms used by the Twitter user, it makes an interesting comparison with AF1 who presented similar frequencies to them. Upon analysing 327 Tweets with related SD terms, this user presented many arguments for their non-organic, yet sustainably produced milk, often drawing comparisons between organic and non-organic milk and presenting a somewhat oppositional stance towards the movement. They frequently state the health benefits of their product, whilst championing a fair price for their local, independent farmers.

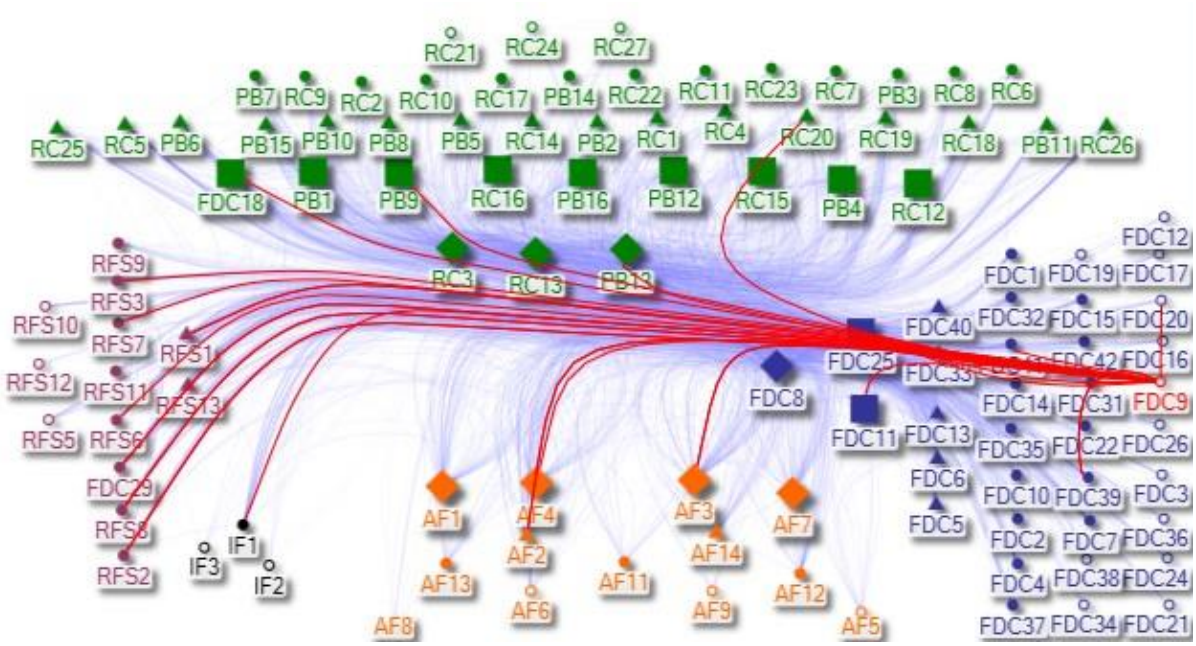
5.6.2.5 FDC7 Honey Producer



This Company produces high quality, unpasteurised honey which they retail both online and in small independent shops and farmers markets. Whilst they are approaching the midway of the eigenvector centrality score for this network, they still have a high level of other actors within the network following them, although they do not follow the same amount back. As previously indicated, this actor has a higher level of Betweenness centrality than the more connected and more central eigenvector centrality score of RFS1.

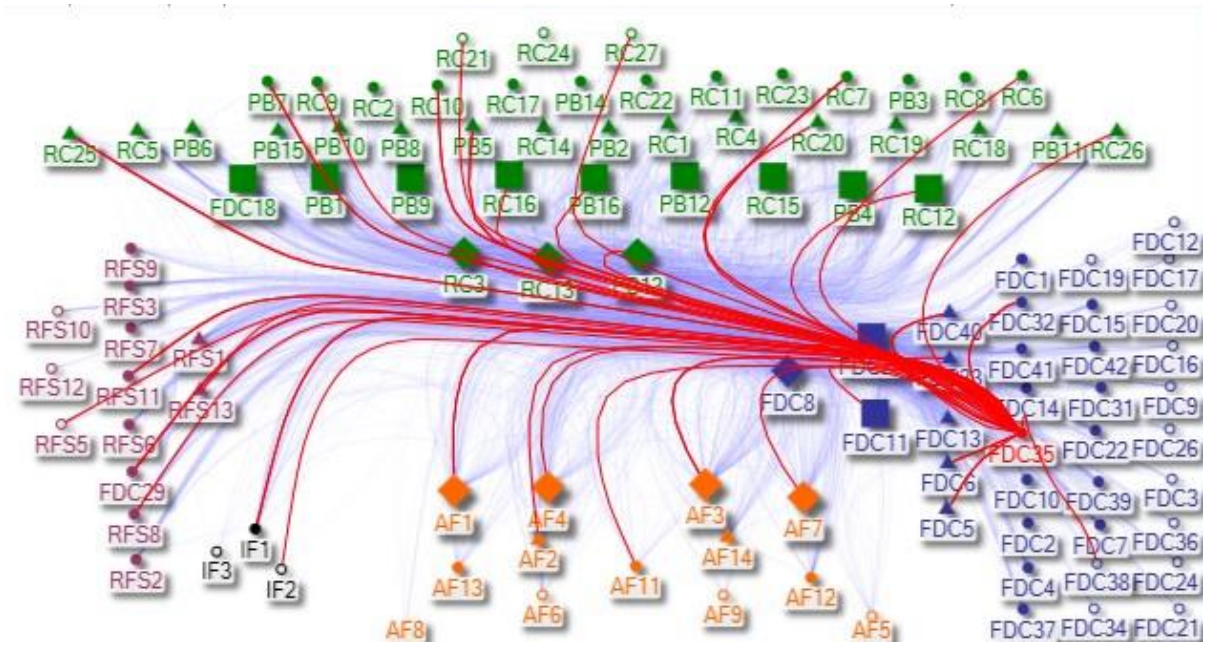
We can see that just under a quarter of all actors in the network have ties with this actor. When analysing 99 SD related Tweets, it was apparent that the health benefits of their product were a regular Tweet, along with stating where to locally buy their product from.

5.6.2.6 FDC9 Preservative Manufacturer



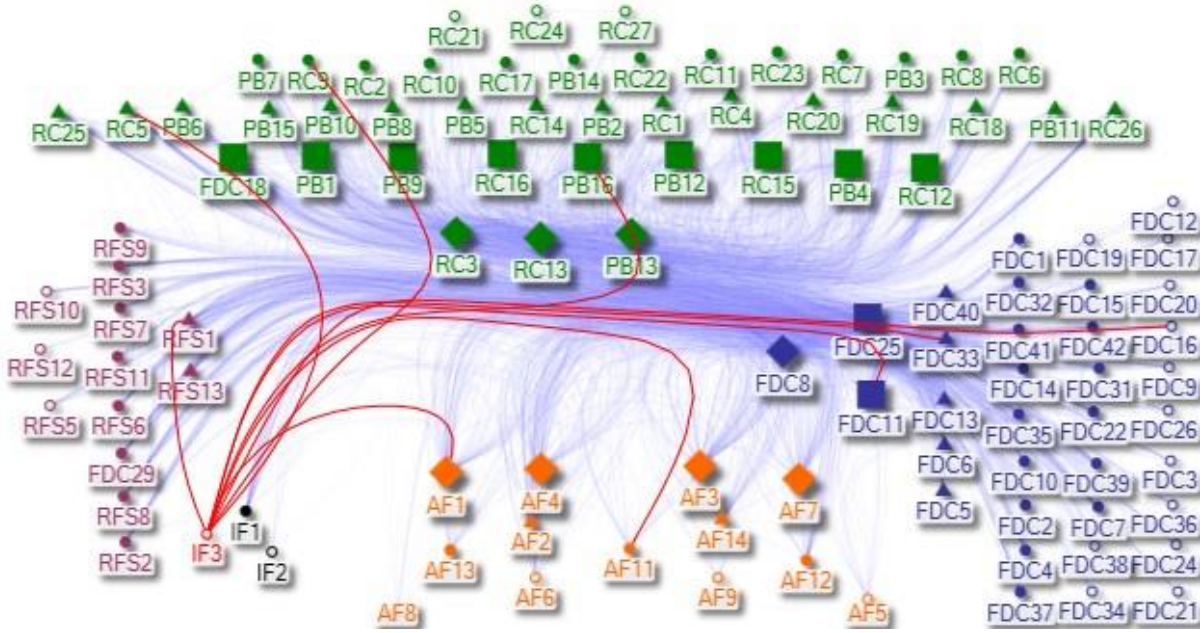
This Company produces high-quality jams, chutneys, marmalades, and condiments. They have a low level of both eigenvector centrality and Betweenness centrality in this network; this is due to their limited Twitter connections as a whole. They are one of the least connected food and drink companies of the network, and therefore present an interesting example in relation to others. When viewing their relations on their sociogram we can see that these relations are predominantly with specialist retail shops, farm shops, and farmers markets, thereby giving an indication of their route to market within this network. They did not appear on the top three of any SD related terms and viewing 169 of their tweets which included such terms, many were linked with being local.

5.6.2.7 FDC35 Fruit and Vegetable producers and retailers



This company grows and buys organic fruit and vegetables and retails them by way of a box scheme method where they delivery direct to the customers address. In addition, they make a seasonal vegetable stock, for individual customers, and they also supply local restaurants and cafés with produce. Their eigenvector centrality score places them in the lower half of all nodes in terms of connecting to other actors who are central within the network. This may suggest that this actor exhibits signs of being a periphery actor, or is just selective about who they chose to follow. Their Betweenness centrality score is low at 11% and they are the first actor participant who has less than 20 followers from others within the network. Although they still follow 33 other actors, many of which are the specialist retailers and the eateries in the network. They have few relations with other food and drink companies; this is perhaps because of their routes to market and potential low engagement with other food producers. When analysing 122 SD related terms in their Tweets, mainly relating to local, ethical and organic food production, they also promote notions of seasonal produce, along with some retailers who stock their produce.

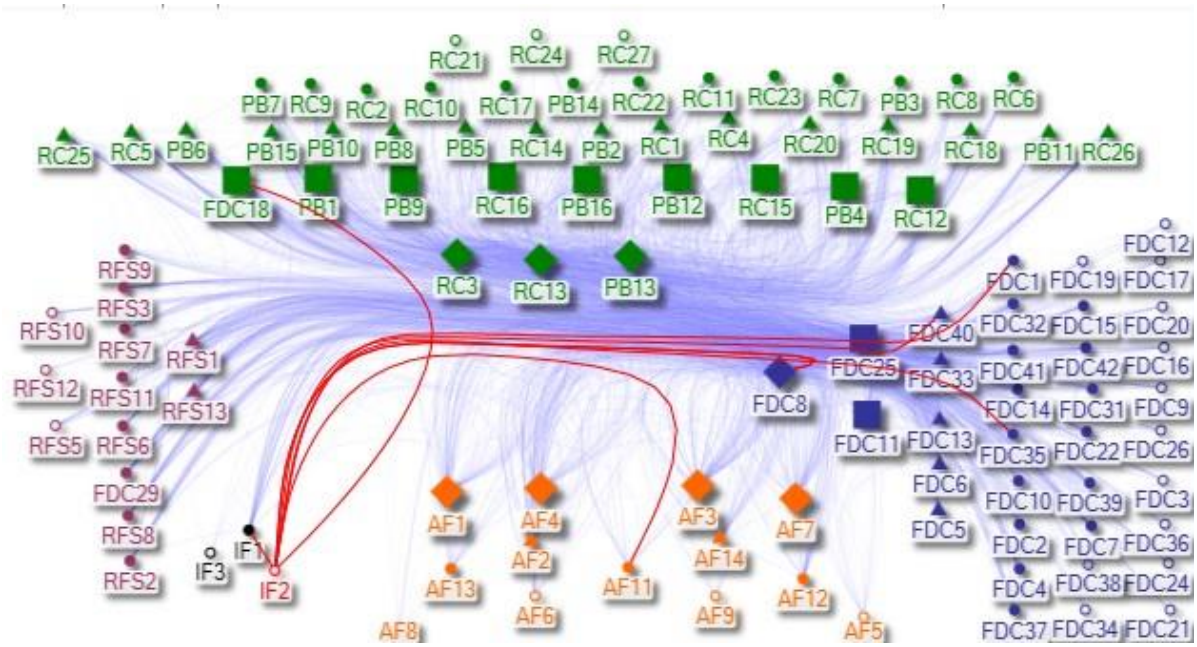
5.6.2.8 IF3 quasi-public business support



This institutional framework actor is a regional business support agency, paid for by private membership contributions, and a non-profit organisation. It is a quasi-public organisation and, because of its overlaps with private and public engagement, it is classified as an institutional framework actor. This organisation has almost no connections to other actors in the network; they are not following any members, and only have nine followers. Furthermore, and not surprisingly, their eigenvector centrality is one of the lowest in the network and as a result, they are most certainly at the periphery of this network. This actor was approached to gain an interview in order to give their own perspective on networks, the food sector, and also as a way of further investigating the relationship between virtual embeddedness and other forms of embeddedness within an AFN.

A total of 100 SD related term tweets were analysed, almost all tweets were similar in nature to IF2 in terms of supporting the local economy and community with advice and opportunities available. Some SD terms such as ‘health’ and ‘fair’ and ‘environment’ were used colloquially in a business context such as a healthy economy, a jobs fair, good working environment.

5.6.2.9 IF2 Private-Public business support



The final actor selected for an interview was another institutional framework, a voluntary private and public sector partnership whose responsibility includes determining the local economic priorities and development of the economy in general. Much like the other IF, this organisation has an extremely low level of eigenvector centrality measurement, in fact, the lowest of the entire network. This participant interview can help with informing discussions concerning the policy implications of Brexit and regional development.

When analysing 199 of their SD related terms, almost all of their Tweets were also promoting the 'local' economy in general terms, they provide a lot of information for small and local businesses, along with community engagement activities and opportunities. There was very little by way of environmentally specific tweets.

5.7 Limitations

The density of a network can only provide this research with an understanding of the level of relations, it does not account for the extent of these relations. It may be the case that a certain Twitter user in the AFN has a relationship with another; however, they do not share any content together, comment on each other's posts or retweet others' comments. Furthermore, it does not show the account of the physical real relationships that may or may not exist between these network actors. However, by obtaining this basic information of connectivity, further investigations can take place in order to assert whether or not a relationship is present offline. This can be achieved by analysing NCapture Tweets or interviewing or surveying actors within the network.

As the content analysis was conducted only once after the Twitter Users were identified as part of the SNA, more insights into Twitter activity could have been further investigated if a follow up NCapture procedure was conducted several months later. This would have enabled the researcher to explore whether any of the Twitter users had altered their tweets, for example, over a busy summer period or a seasonal holiday such as Christmas.

Finally, it was initially anticipated that text data from the interviews would be available to be coded and graphically depicted in sociogram format, however, this was not possible due to the researcher not having access to sufficient software options. NodeXL-pro offered such a service, however, this was not economically viable for this research project. The interview transcriptions were therefore analysed using discourse analysis which still allowed for a sufficient appreciation of the full nature of the debates.

5.8 Chapter Conclusions

This chapter has been somewhat descriptive due to the nature of introducing and explaining key terms concerning graph theory and SNA. It has been necessary to provide a clear account of exactly how this section of the research was conducted in order ensure that it can be as replicable as possible in further research on this topic area. SNA has proven to be a useful tool when obtaining a basic understanding of what a virtual AFN can look like. As a result of following this secondary data collection methodology (as Twitter connections are in the public domain), this research has developed an understanding of connectivity of many food actors in a given territory. In this example, the results suggest that this network is not particularly well connected as only 27% of ties existed. By using SNA software programmes such as NodeXL, sociogram graphs can be created in order to help visualise a given network. The sociogram graphs summarise an enormous amount of information regarding connections and enable the researcher to present them in a way which is easier to comprehend than a dataset spreadsheet for example. By knowing who is central to the network and how densely connected it is, the research is then provided with a suitable baseline upon which to conduct further analysis. The limitations of using SNA have been discussed, along with potential improvements for future research using this method of participant selection.

In this chapter, the basic frequency content analysis was conducted which resulted in focusing tweet searches to a specific set of SD-related terms which were deemed pertinent and of value to this research. As a result, a mixture of participants were selected for an interview, thereby providing this thesis with a broad range of actors from this food network. This diversity along with some comparable features helps to prevent bias in participant selection.

Thus the subsequent chapters now benefit from obtaining at least one participant from each AFN grouping type, along with some participants who were highly central to the network, for example, AF1 and RC15, and those who were on the periphery, such as IF1 and IF2. Furthermore, actors who expressed varying degrees of SD related content on their Twitter account were selected, from FDC9 who had very little to say on this topic, to AF1 and RC15 who were the key contributors to tweets on a number of agenda topics. This mixture of types and positioning within the virtual network can be viewed as a successful outcome of the SNA conducted in this thesis.

Chapter 6. Discussion and Analysis; of social network analysis, interview results, and existing scholarly discourse.

"Trust a witness in all matters in which neither his self-interest, his passions, his prejudices, nor the love of the marvellous is strongly concerned. When they are involved, require corroborative evidence in exact proportion to the contravention of probability by the thing testified"

Thomas Henry Huxley
Essays upon some controverted questions, p.344 (1893)

6.1 Chapter introduction

The discussion and analysis presented here forms the penultimate chapter in this thesis. It draws together some of the key findings that have emerged from the SNA as well the interviews conducted with selected participants. The previous Chapter outlined the methods used in order to conduct the SNA, however this chapter synthesises this with the results of the interviews, and the literature which they are related to.

6.1.1 Objectives of the chapter

The purpose of this chapter was to directly address the third objective of this research: "Critically evaluate AFN actor perceptions of sustainable development from an online and offline perspective in relation to current scholarly discourse".

6.1.2 Structure of the chapter

The discussion and analysis chapter starts out by investigating the dichotomous relationship between CFNs and AFNs which is concerned with views from participants regarding supermarkets, the unrealistic cost of food, the AFNs movement's values in general, and the relationship that is present between AFNs and CFNs. The chapter then presents a narrative of local tensions between two cooperative organisations, with particular focus on analysing territorial tensions between AFN actors. The chapter progresses onto an account of industrial quality conventions, specifically labelling and regulation. Debates are also presented concerning; tensions, favouritism within Twitter networks, the lack of physical structures and organisational support for AFNs and some of the challenges of dealing with CFN actors. This leads onto a discussion and analysis regarding the organic movement. This contentious issue was examined in detail from the perspective of farm shops and food and drink companies, and covered broad issues concerning demand from customers and misconceptions. Ecological embeddedness was also covered, including their relations with social aspects of sustainability.

The chapter also finalises with a debate concerning procurements and intermediates within this AFN. This issue is summarised with an account of contract disputes, issues of frequency of supply, and relationships with wholesalers.

6.2 The dichotomy of CFNs vs AFNs

As discussed in Chapter 3, a significant amount of literature has shifted the debate away from CFNs versus AFN and the associated 'good versus bad' approach to the topic that was present in initial scholarly discourse. Notable contributors to this shift in debate include; Sonnino and Marsden (2006b); Barbera & Dagnes, (2016); Ilbery & Maye, (2005a); and Tregear, (2011) (Hill, 2014). This shift in debate was substantiated throughout the interview participants, however, there was a clear recognition of the dominance and hegemony of CFNs. For instance, the owner of one food and drink company summarised this in a straightforward way;

> *"Don't underestimate though, with food almost all of the main scale food trends have been towards the cheapest. There's growth in organic, and other things, but that's offset with the vast majority of the mainstream food becoming cheaper and cheaper"* – FDC35.

This statement underscores the very core of the debate when it comes to how supermarkets and chain eateries (restaurants, bars and cafes) continue to exude their dominance over the food and drink sector. The same participant from the previous quote expanded on this issue by stating;

> *"That's giving an unrealistic way of paying for food, and people don't want to go back to paying more. That makes a race, everyone is squeezed to make it cheaper and cheaper. The difficult thing is to get that message out there. Your pound and where you spend it is probably the most, I would argue, almost the most meaningful vote you have"* – FCD35.

This unrealistic way of paying for food raises a very good issue about the true cost of food and drink production; "*real cost of the food is not given to the consumer, someone else has the environmental costs that they then need to clean up"* – FCD35. This issue links directly with the polluter pays principle whereby those who cause pollution (environmentally or socially) should compensate or pay for their actions. In food and agriculture production, a notable example of this would be complexity of water contamination by nitrogen run off into water basins boarding agricultural land. What needs to be considered is the cost of water decontamination, and the loss of biodiversity and ecosystem services in the habitat, however this is a complex and challenging task and requires heavy regulation (Howarth, 2009; Howden, Burt, Worrall, Mathias, & Whelan, 2013). When taking into consideration the movement values of AFN actors, which includes making sure that the environmental and social cost of production of food stuffs is factored into the end customer price, which also links with triple bottom line concept of sustainable development (Elkington, 1997; Hinrichs, 2000). A critical consideration when viewing the polluter pays principle is that unless all actors are equally responsible and

compensate, or factor in, the cost of their pollution, then those who do not do this are at an unfair economic advantage (Ambec & Ehlers, 2010).

There was clear contention in the AFN network with regards to the CFNs. One participant, the dairy supplier, lamented fully and at length the mainstream industrialised nature of the dairy industry in the UK. The participant spoke about how the dairy industry in the UK was dominated by two large multinational dairy companies, one from Denmark and the other from Germany, and what their intentions were;

> *"About 80% of British milk industry is controlled by two European Dairy companies, whose one objective is to close our farms, so they can use their excess milk to feed Britain"* – FDC3.
>
> And;
>
> *"What I'm trying to do, is connect with the public and say, we've got to sustain these British farmers. Their cost of production is 28p, we pay 30, [per litre], they can reinvest. The figures are going up. It's machinery, loans, land, fluctuating price of oil, it changes every six months. We want to be 2 to 3p above that"* - FDC3.

Ensuring that a fair price is paid to the suppliers of this company's milk is paramount to their business model, along with producing milk which is considered a health product with regards to the selenium rich content milk. This issue will be discussed in more detail when discussing quality conventions that arose from the interviews.

However, challenging the hegemony of the CFNs is a clear integrative theme which connects most clusters of codes within this analysis together (see King, 2012). By using the social media platform Twitter, this food and drink company was able to publically voice their opposition, Figure 15 shows

Figure 15 Challenging conventional prices

this user actively engaging in dialogue via 'tagging' the username of a CFN actor who appears to be an international dairy farmer.

It should be noted that although Tweets are in the public domain, in an attempt to preserve the anonymity of the research participant, their Twitter logo and user name, along with other individual people, but not companies, were blurred.

When analysing this specific Tweet, it could be argued that the supermarket does not explicitly print 'we give back to the British farmer'; rather, we give back to the farmer. Furthermore, the supermarket may source from a broad range of national and international farms and as a result their supply chain would be dynamic enough to use this implied quote. The milk producer FDC3, however, is publically drawing attention to one specific international dairy producer who supplies milk to this supermarket and would benefit from what is implied in the picture. This AFN actor is demonstrating what was asserted by Allen (2010), AFN actors "*embody and demonstrate possible alternatives when other options for change seem foreclosed or beyond reach*" p.305. This debate also links with concerns over the commercialisation and marketisation of AFN movement values. Therefore we can see that social media platforms such as Twitter give AFN actors the ability to have a dialogue or a conversation with others in the food sector. Individual Twitter users tweeting in the public domain may lead to greater numbers of individuals being more open to scrutiny and thereby supporting AFN movement values. Where extraordinary claims are made by a company or organisation in the food sector, these claims can be easily challenged, in a public setting, with the ability for customers and consumers to also engage. The milk producer was aware of how powerful the social media tool can be in this regard, especially in pointing to future trends and the sense of community in this specific part of the food sector;

> *"The fact that we are communicating through this platform with other producers and other farmers is really good because the next generation of farmer will be using this even more. They are now. A lot of farmers will use social media and twitter specifically, because they start so early in the morning, they're working on their own or with a small knit team, and it's their way of reaching out to other people. So to have them interested in what you're doing, and to show interest in them, it's very good at helping relationships develop as well"* – FDC3.

To a degree, this statement is supporting what Bos and Owen (2016) assert in their study concerning virtual reconnection by highlighting the use of social media platforms such as Twitter and Facebook

being a key promotional, communicative facilitator of interactions within an AFN, as it can enable businesses to connect with their suppliers, customers and retailers easily (Castells, 2011).
This being said, Jarosz (2008) prior claims that "*increased face-to-face interaction between growers and eaters enhances not only farmer income, but engenders trust and cooperation within a community* p. 234", may need to be revisited in light of a potentially changing communicative landscape.

In reality, how often would farmers, growers, producers, retailers, and consumers come into contact with each other? Perhaps not as frequently as necessary for such trust and cooperation to develop in some instances. Therefore, having a platform that enables anyone to join the debate at any time further helps this trust and cooperation, especially given the open and transparent nature of public domain interactions.

Where this company openly expressed contention with CFN actors and processes, this was not always the case with other actors in the AFN. CFNs were not always portrayed in a critical light. An owner of an independently owned café which specialised in providing locally and ethically sourced food and drink considered the chain stores to be of benefit to their business;

> *"It's good to have a diverse market place for businesses, mixture of independent and chain in the economy, there's a lot more choice"* – RC15.

This participant recognised the realities of running a café on a busy street within a city centre and that there will be a mixture of independent and chain competitors. The café owner went on to say that they each come with certain levels of expectations;

> *"All you need to do is walk down Bridge and Pepper Street and you can see the chain stores. But I think it's healthy to have that nice mix, there is something there for everybody. You aren't going to get a good breakfast in café Nero, maybe Panini and some good yoghurts. You're not going to get the same pasta in Pizza Express* [conventional national chain] *as you are in Piccolino* [independent restaurant chain]*. You pay the premium, service ambience and quality"* – RC15

Therefore an opposition, or competition towards CFN from the perspective of AFNs is again, rather a difficult thing to define and explain. On the one hand, the milk producer is challenging the dominance of multi-national dairy producers who are benefitting from a supermarket promotion which appears to suggest that they are supporting British milk producers, yet at the same time their unique selling point is that they are providing a healthier produce and arguably making more of a sustainable commitment to their suppliers.

If it were not for the CFNs involvement in the milk industry, then perhaps their product would not have its unique selling point. The café on the other hand sees the CFN food and drink retailers as a good thing for business, that diversity and choice enables both sides of the food system to stay in business.

The café owner continued to explain that the expectation that consumers will shop with a given company because they are an independent or local should be avoided by stating that;

> *"In Cheshire people want to support the local independent businesses. The ones who are good survive, they have longevity. The small independent local businesses who go out of business, who don't put the effort in or when they're not having that consistency as the chains do. Like with opening times, something as simple as that. Or quality of a brand standard as you would say in a big company. At quarter to 3 we could offer a salmon sandwich, we would make one if we didn't have it" – RC15*

This speaks to issues surrounding the quality conventions listed by Murdoch et al (2000) and Thévenot (2002); 'public'- 'concerning the importance given to trademarks and brands'. By building up a brand reputation as a reliable supplier of good quality food, alternatives can be well placed to succeed against the conventional competitors, even in a city centre location where chains are prevalent.
A final indication of this café owner's opinion regarding chain opposition was summarised in a way which arguably highlights the realities of all businesses;

> *"A lot of these small businesses complain about the chains, but if you're not putting up a fight then you can't blame [them]. You have to keep the consistency on how the business works. If we started closing at 4:45, then people would stop coming if we were shut, we would lose customers"* – RC15.

As mentioned by the café owner, customers want to support local businesses, but only if they are of a sufficient standard, or quality, and somewhat comparable with the chains on basic business practice such as opening times and stocklisting.

The debates in the literature surrounding local and quality are far ranging, especially when referring to quality conventions which state that quality is socially orientated to support a local and often rural community; establishing transparent relationships from the farmer right through to the consumer, as well as environment stewardship principles (see for example Migliore et al., 2015; Murdoch et al., 2000; Renting et al., 2003). When exploring notions of localness with the interviewees, a narrative was produced which showed contention within AFN companies.

6.3 Short Food Supply Chains

As stated in the literature review chapter, SFSCs have two distinctive characteristics that are useful in conceptualising the term: 1. A focus of containing an AFN within geographical territorialities of place and space; and 2. Minimalising the amount of intermediaries within an AFN (Kneafsey et al., 2013; Parker, 2005 as cited in Benedek et al., 2014). These two characteristics were discussed during the interviews at length with varying interpretations, and strengths and weaknesses for both characteristics. For example, the first characteristic of the'focus of containing an AFN within geographical territories of place and space' raised some interesting viewpoints surrounding the 'local' movement.

6.3.1 Localism

When discussing notions of localness, the participants were very aware that local does not necessarily mean good or sustainable. Both explicitly and implicitly, notions of quality conventions were discussed at local levels to varying degrees, some participants stating quite clearly that just because a food and drink company was local, it would not necessarily be a pre-requisite factor when establishing connections with them. For example the farm shop stated;

> *"I think you need to have the balance of the two [quality and local products], they* [consumers/ customers] *want to know that they're getting quality, yet we might get approached by a local supplier who tells us they have this local product.*
>
> *If we try the product and it isn't great, we won't take it. It needs to be certain standards. We have our benchmarks, and also our customers expect to come here and buy their green and red peppers alongside local products. There is still an expectation that we will get some*

> *products from say the 'Liverpool Market' that has been flown in. You won't be able to get a good olive oil from locally. I think you can showcase local produce much better if it's supported by national and international products"* – RFS1.

It was interesting to learn that by having suitable local produce alongside national and international products, it can be used as a "showcase" in terms of marketing comparable products, thereby potentially raising the profile of local products and produce.

Although it could be argued that this somewhat echoes what was warned by Gunderson (2013), when he stated that capitalism leads to the marketisation of values, and that ethical and sustainable consumerism does little to redress a given value chain as they can still be exploited. It might simply be the case that a further consideration here is that retailers want to have good 'quality' produce, regardless of how quality is defined, and it is not practical to offer certain products or produce from a local only stance, therefore the wider debates around capitalism are too detached from this AFN actor.

The fruit and vegetable supplier went to lengths to stress that the 'local-movement' was not just about territory and place, but much like the organic debate, there was more concern regarding the production methods:

> *"As a message, local has been enormously successful, everyone gets it, they see local and think it's a good thing. But the realities of it are a lot more nuance, in my experience local food, and producers of anything, local is only good if your local producers are good. If there was a gigantic battery chicken farm on the outskirts of Chester, Chester chicken, and everyone bought chicken from there, you could argue that it is supporting local, but I would argue that you're supporting a bad method of farming borderline inhuman in some cases, you're just supporting bad business, that's just mono-cropping farming, that's where local falls down. It needs to say local with ethical practices, or sustainability, not just local"* - FDC35.

In terms of further disconnecting notions that assume 'local' is a major consideration with regards to AFNs, the fruit and vegetable producer also mentioned the realities of global supply chains, and advantages of using them, which to an extent helps to dispel any mistaken thoughts that all AFNs operate in geographic isolation:

> *"To be brutally frank, the local thing is important, but the quality and the freshness, especially with veg. Being a perishable item, being local it makes a big difference, but it's not just local*

> *because if they were there with [poor] quality, we wouldn't use them. Because they're local and there has to be good value there, and within a good price tolerance"*
> *And;*
> *"If I went and sourced organic chicken from Norway, and he's raising his birds to a very high standard and those animals are happy, he's a better employer and the rest of it. Which one is better? I'm a big fan of think local act globally. Being someone who is a supporter of organic, we're one planet, it doesn't matter where you are"* FDC35.

This brings the local debate to consider the debates surrounding food miles. As highlighted in the literature review, food miles, much like the overarching debate surrounding localness, show only a small part of the overall narratives of AFNs.

Edwards-Jones et al highlight this all too well; "*Only through combining spatially explicit life cycle assessment with analysis of social issues can the benefits of local food be assessed" (2008, p. 265).* Furthermore, Coley, Howard and Winter's (2009) farm shop vs large-scale mass distribution box scheme research, concluded the need to consider the wider implications of the value chain, both from a consumer point and their carbon foot print, and the production and distribution of produce (C. L. Weber & Matthews, 2008).

The organic fruit and vegetable producer acknowledged this by stating that;

> *"If you take the average crop, the largest part of the environmental costs comes from the fertilisers and pesticides, herbicides. A carrot or apple's carbon footprint, the food miles is a small percent compared to the inputs"* – FDC35.

Through sourcing products from outside a specific territoriality, producers can avoid the 'lock-in' relationship, and 'local trap' as warned by Born and Purcell (2006) as potential suppliers can be considered regardless of place, in favour of socio-cultural and environmentally sound principles. Otherwise, the goal of AFNs becomes more of a locally focusing one rather than one of economic, social and environmental alternative to CFN (Barbera & Dagnes, 2016).

However, the city centre café, which stocked a variety of local produce, firmly supported localness by way of supporting independent food and drink companies and retailers in and around Chester.

> *We try and support other independents because they support us. We get some of our fruit and veg from the greengrocers on this street, the butcher in the market around the corner in the market. There are three in the market.* [Food actors name removed for anonymity purposes], *I can refer customers to him, I have his name on the menu. It keeps him in business; our customers comment on the quality"* – RC15.

The butchers in question were not on the socio-gram of Twitter connections as they had their username as an individual butcher using their own name. However, after conducting the interview with the café owner, the author independently verified this claim. The butcher was cited by the Chester Market's 'trader-profile' as sourcing local meat and poultry.

This being said, unless this participant was then interviewed and a greater and more in-depth analysis of this individual supply chain was undertaken, it is not known whether the meat and poultry sourced locally was bred and reared locally, or with sustainable production methods. Thereby further highlighting the hypothetical situation of "battery farmed Chester chickens" by the fruit and vegetable producers, and notions that where local is supporting local people economically, by keeping money in the local economy, the degree of in-depth knowledge about where the food comes from and how it is produced is sometimes limited or not explored. It should be noted that the butcher in question is not being accused of sourcing local meat which is unethical or battery farmed, the example serves as an illustration as to the possible lack of in-depth knowledge concerning food other than a menu stating that the product is local for example.

6.3.2 Views towards Intermediates

As outlined in the literature review chapter of this thesis; the removal of as many intermediates, also colloquially known as go-between or middlemen, as possible between the primary producer and the consumer is seen as a characteristic of SFSCs and AFNs in general. By removing as many intermediates as possible, the literature suggests that this enables the primary producer or manufacturer of a food product to have a greater level of control over the marketing strategy and price, whilst also enabling a greater level of reconnection between consumer/customer and grower/producer (O'Kane & Wijaya, 2015).

This is one of the central themes running throughout much of the discussion concerning AFNs and links closely with consumer led values and aims of reconnection with their food and increased transparency and accountability within the supply chain (Giampietri et al., 2016; Grunert, 2002; Turner & Hope, 2014). A view that is laboured by the honey producer:

> *"If you're dealing with a white vanilla distributor they don't really care, all they're interested in is the profit margin. There is no relationship there. And very often the sales guys they have gone out there, they're regional, they have no idea how your product differs from something else. They're not as passionate about it, so the next investment we'll make is for internal sales and marketing and admin, just so that we can promote more internally"* - FDC7.

This opinion resonates with the issue of reconnection; the participant here is clearly lamenting their views towards such a route to market and supports the same assertion made by Berti and Mulligan (2016) who suggests intermediates remove reconnection efforts made by AFN actors.

This dissatisfaction towards the way the intermediate treats this individual's products, or the perception of it, is clearly an issue that is worth consideration within AFNs. The intimate connection with the product is not just a consumer led characteristic of AFNs, some owners of companies and managers of organisations within this study have stated that they see this as an essential and desirable aim of their business activities.

When attempting to bypass intermediates, the manager of the food cooperative AF1 provided a summary of major challenges her members experienced when attempting to have their produce retailed locally:

> *"None of us sell to local restaurants. We retail ourselves. Because we've experienced that when you go through them you're selling to a middleman for all intents and purposes, they're the ones who make all the profit"* – AF1.
>
> *And:*
>
> *"They* [local eateries] *want free range, outdoor reared and bred, all the top quality but for the buttons price" – AF1.*

The two quotations not only suggest that some local bars, restaurants, cafes and pubs source their produce from wholesalers, distributors, intermediates by definition, but also that some of these eateries may not be willing or able to pay what the producer feels is fair for their produce.

However it was noted by the Chester city centre café owner that they did actively source from local producers, such as the local butchers in the market place in Chester.

The organic fruit and vegetable producers cited a reason for limited dealings with eateries was in part due to frequency issues in relation to CFN and their intermediates;

> *"Competing with larger scale wholesalers, on price, the frequency of delivery, that was difficult because they're set-up to do that properly and we weren't"* – FDC35.

6.3.3 Contract acquisitions and intermediates

During the interview with the milk producer (FDC3), the owner of the company somewhat passionately articulated an account of a business interaction that they had with a UK higher education institution in relation to use of intermediates and this being a barrier to trade. It was explained that a University had approached FDC3 because it wanted to source ethical and sustainable milk produce for its cafeteria and campus shops.

After undergoing an audit and then being listed as a registered sustainability supplier through the open procurement tender process, FDC3 acquired a contract to supply milk. It was lamented that a situation arose whereby the buyer wanted to pay a lesser price for the milk that would be used in production of items in the cafeteria, but still give the sustainable price (which would be considered a fair price to the farmer) for the smaller 500ml bottles retailed in the campus shops.

After a lengthy and passionately articulated narrative, FDC3 cited similar frequency difficulties expressed by FDC35, the organic fruit and vegetable suppliers;

> *"So the sales of the 500ml as opposed to the normal ones [2lt], for some reason, they nearly doubled in a week. I said that we're going to struggle to get this there tomorrow because we have to separate all of our milk, we're going to pull out all of the stops…They sacked us, even though we delivered the stuff to them. I knew that we weren't supplying all of their milk, another supplier had been. I want to tell you the full story".* – FDC3.

It was apparent that the buyer had been using another supplier for the volume of milk not supplied by FDC3, and along with this, the other supplier had also allegedly been supplying other produce such as fruit and vegetables as part of a contract deal. FDC3s owner expressed the following summary statement on what occurred in his opinion;

> *"So what these food services companies do is give them one bill and tie them into everything. So what happens is they do so well, they have complete control of who gets with them, and then also with the customer. Because it's one bill per month, week… that customer cannot go anywhere else or else they lose a discount that they get"* – FDC3.

We have to rely on the integrity of the food actor in this situation in order to draw our conclusions without being able to independently verify these claims. However, it is unlikely that this producer was untruthful in this account as the participant knew that the results of this study would not lead to any public acknowledgement of the university in question, and furthermore, it would not be evident who this individual company was. The only example of uncertainty of produce from the literature review was that of Krywoszynka (2014), with her critique of the ecological variations of the wine industry, however this was quite different from contracts being lost on the basis of what was described above. As a result, we can tentatively draw the conclusion that this FDC lost their contract to supply sustainable milk to this organisation for two main reasons. Firstly, it was acknowledged that the buyer wished to make a distinction in cost between milk retailed in public at the campus shops and the milk that would be used in production of canteen meals and drinks. Therefore this can be interpreted as an engagement with an AFN actor in a way which may be construed as deceitful.

This example greatly supports Goodman et al. (2013) suggestions that the 'commercialisation and marketisation' of AFN movement values by CFNs, in this case an institutional organisation, is exploitative in nature and results in "*alternative food movements and markets coexisting in permanent tension"* p.429. The tension here clearly being that one party does not embrace to the fullest possible extent the same values that FDC3 held. It is alleged that economic profits were more important than the social and environmental considerations, by definition unsustainable. The second reason for the loss of contract may have been similar to the concerns raised by FDC35, whereby frequency of delivery, and responding to unexpected demands could have been seen as a cause for concern by the organisation in question.

For an organisation which is used to dealing with a supplier that can be adaptive and produce a given quantity with little notice, the potential disruption combined with limited working relationship with FDC3 may have been a cause for concern. Therefore, an attempt to have a secure supply chain, even if potential disruption was unwarranted, symbolises a further challenge facing independent and small scale companies in general.

6.3.4 Intermediates and routes to market

If a given food and drink company has their route to market with intermediates in mind, then this situation may be avoided. The preservatives manufacturer FDC9 was of the opinion that using wholesalers to reach their retailers, and ultimately customers, was a key feature of their business model. During the interview it was apparent that this company opted for a business strategy which placed them in a position where their main activity was manufacturing the product and ensuring the wholesalers were distributing their product to fit-for-purpose retailers. The owner of this company did state that there was a level of disconnection between the consumer and themselves as a result of using intermediates;

> *"So over the years, as customers have ranged up and asked where a local stocker is, we'll ring the wholesalers and ask for a stockist in Birmingham, and they have to give it to us"* – FDC9.

It was revealed that this company only knew around half of their retailers. The owner stated that they had an incomplete list, but some of these were without contact details for the retailers, as a result this demonstrates the penalty for using intermediates in this manner.

This was further explained by the following statement;

> *"For us we can't access them, we have a tough job trying to get our suppliers. Because if we ever fell out with them and we knew where all their shops were, we could just go directly to them. So that to them is a very uncomfortable knowledge to do that"* – FDC9.

This food and drink company (FDC9) is producing a specialised product; high quality preservatives, produced by a family run company, and raw materials sourced locally with established relations with their suppliers and some local retailers. This is similar to the hybrid 'world of innovation' AFN member, as developed by Ponte (2016). However, on the other hand, they are primarily using a route to market which is generic. In doing so, they are only going so far when it comes to embracing the values of AFN and SFSCs. This company's life cycle stage was one on the verge of developing a national brand. Therefore, the degree to which they can be classified as alternative is questionable. Rather it is most likely the case that this organisation reflects many micro, family run, locally focused businesses who, as they get start to expand their business activities, cease to use their traditional networks and routes to market. This case might by typical of many food and drink companies in this position.

After all, if a company has developed a reputable brand image locally, which then has led to an increase in demand elsewhere, demand for their produce will invariably cause a shift in decision making when attempting to cater for this increase. Following up this point with the interviewee, it was

clear that she had considered the financial implications of their route to market in relation to expanding their business using a wholesaler;

> *"Others* [who sell directly to retailers] *can afford to employ more people, they're taking the distributor margin and their own margin. Whereas we can get 30 to 40% profit margin, they can go for 40 to 60% for example. But then they have all of these overheads as a consequence*" – FDC9.

However they did acknowledge that using intermediates would not be possible for some of their raw material providers, for example;

> *FDC29, they dig their asparagus out that morning or evening then deliver it, it's so fresh and to add someone into the middle of that chain would ruin the products. We try to get the best price, obviously, we're an enterprise, we try and get direct supply, and we can then get them on our time scales"* – FDC9.

This underscores the individual differences that are present in AFNs. Each AFN grouping type has their own specific challenges, routes to market, limitations, and so on. Therefore, perhaps it is idealistic to assume that AFNs can be classified in over simplistic stereotypical categories. Returning to the literature review chapter's initial definitions of AFNs as an evolving concept, especially citing the conventional vs alternative terms associated with AFNs in Table 3, reminds us that we should expect great diversity.

The manager of the cooperative, herself a pig farmer who produced specialised, ethically reared and sustainably managed produce, stated that they themselves would not compromise their usual social engagements in favour of farmers markets or an event which may generate them a lot of sales. An example of this was a community ran meal scheme the cooperative supported*;*

> *"No we didn't* [attend the Chester food festival] *we also run a Sunday lunch club for people who are socially isolated, that was on this weekend so we didn't go… We run it as a community group, "meat and two veg". It gets people out of social isolation"* – IF3.

Of course the producers who retail through this cooperative are ultimately seeking to be economically viable and commercially aware when it comes to trade opportunities, however it was encouraging to see that this actor, who had the highest level of eigenvector centrality in the AFN Twitter network, was supporting the traditional movement values. Thereby demonstrating civic quality as identified by Murdoch et al. (2000) and further supporting claims that quality is socially orientated to support local and often rural communities (Migliore et al., 2015; Murdoch et al., 2000; Renting et al., 2003).

6.3.5 Local conflict exemplar

Holloway et al (2007) presented a methodological framework for exploring food production and consumption relationships which can be used in this thesis to take the 'relations' dynamic on AFN territoriality provided by Dansero & Puttilli (2014) in order to further explore this particular AFN. The analytical fields below are derived from *"an initial analysis of over 100 food projects, all with UK consumers and almost all actually based in the UK"* (Holloway, Kneafsey, Venn, et al., 2007, p. 7) and are shown in Table 15.

Heuristic analytical field	Examples from sample food projects
Site of food production	Community garden, school grounds, urban brownfield sites, farm, rented field, allotments
Food production methods	Organic, biodynamic, consumer participation, horse ploughing
Supply chain (area of exchange)	Local selling/procurement, Internet marketing, Farm shops, farmers markets, home delivery, mobile shops, pick-your-own
Producer-consumer interaction	Direct selling, e-mail, newsletters, cooking demonstrations, food growing work (such as weeding parties), farm walks, share/subscription membership schemes
Motivations for participation	Business success, making food accessible, social/ environmental concerns, anxiety avoidance, sensory pleasure
Constitution of individual and group identities	Customers, participants, stakeholders, supporters groups, children's groups, disability groups, women's groups

Table 15 Heuristic analytical field (Source: adapted from Holloway, Kneafsey, Venn et al., 2007)

Holloway et al argue that by using the heuristic analytical field; *"a more complex and multidimensional analysis of the specific arrangements of projects across a diverse range of analytical fields opens up analytical opportunities for assessing the plurality of relationships between schemes and power relations in an overall food supply system"* (Holloway, Kneafsey, Venn, et al., 2007, p. 15). This serves this thesis well in providing a baseline upon which to conduct further analysis in the discussion chapter of this thesis.

There appeared to be tension between AF1, the online retail cooperative, and another local initiative that sought to create a similar SFSC initiative in the same territory. The AF1 cooperative manager indicated that;

> *"We love [name of similar scheme removed for participant], you can order your veg, fish, beer, except the butcher who won't partake in anything… but they now offer this, their collection is the same time and day as [AF1]. I'm just a bit like, I don't understand why they've done this. I would promote this. I would say to our customers, if you want something that we can't supply you with, go to them"* - AF1.

Scholars have warned for some time that we must avoid inadvertently idealising relations between those AFNs who are socially embedded, and not to see them as benign (Sayer, 2001), and the comment above somewhat relates to this issue. In this particular comment, the cooperative manager is referring to a similar SFSC initiative that mirrored what their organisation achieved, this being an online platform retailing local, ethical and sustainable food produce, whereby the producers receive all of the proceeds through minimising intermediates, by definition a SFSC.

However, the other initiative, either by design or inadvertently, chose to host their pick up time and day of the week exactly the same time as AF1 cooperative. This conflict, and ultimately personal gain from the point of the organisers of the rival initiative, further labours this point and supports Sayer's (2001) precautionary words. Some have critiqued food-localism movements as unreflexively utopian, depending upon a romantic and unquestioned communitarian vision of social justice.

This example of conflict speaks to what Watts et al. (2005) in their paper on reconnection within AFNs further warns of; "*in a neoliberal market economy, producers of protected and speciality foods may end up competing against each other for finite niche markets*" p. 28. This statement underscores the reality of the fractured and somewhat disjointed nature that appears to be prevalent in AFNs, and highlights the previously discussed notions that AFNs and CFNs are not only in competition with each other, they are in competition with themselves.

AF1 is a territory based cooperative of a much larger national body. Each group represents an individual area and where items cannot be sourced from local producers, items from elsewhere can be sourced if required. Given the conflict and opposition present from the two cooperatives, it is apparent that there must be several smaller networks which may exhibit favouritism towards those who they are already engaged with. Of course companies and organisations that directly trade with one another will probably also follow those who they do not have physical ties with, perhaps following them because of a territory link or as the milk producers stated; *"There are certain followers on there who are non-followers, they are followers because they've seen you at a competition… Others are with*

large companies who are feeding back information, unfortunately" FDC3. There is a strong possibility that this may be one of the main reasons for such a low level density within this AFN network. Some Twitter users may follow each other because of curiosity rather than collegiality.

A potential reason why conflict and a low level of density in the network exists could be attributed to a lack of organisational and physical structure coordinating AFN activities, as highlighted by Cleveland, Müller, et al. (2014). After all, we see two cooperatives, with very similar values, operating in the same city, which are not cooperating outside of their own supply chain. To a researcher examining this network, it would appear that there is little, if any, coordinating instructions for AFN actors and as a result, conflicts of interests such as this evolve.

However, a small amount of compromise may be all that is required to ease tensions between AFN actors, therefore physical support structures may not be necessary, and also not what is wanted by those individuals involved. This issue was somewhat raised by the owner of the fruit and vegetable producers when referring to regulation and compliance. During the interview the owner suggested that;

> *"bankers want to regulate banks, farmers want to regulate farms. More often than not, those accreditations aren't worth the paper they're written on, they're there to support the status quo, or the current situation, not to challenge or try to improve things really" – FDC35*

It is clear that further research would aid in our understanding of whether or not increasing organisation and physical structure to help coordinate AFN activities should be implemented. Such structures would have to be carefully constructed so as to not take away the autonomy of AFN actors.

6.4 Ecological embeddedness

6.4.1 Bee keeping example

As outlined in the literature review, there were recent claims that there was a need to conduct greater research on environmental embeddedness, chiefly Hedberg (2015) stating the need to examine ecology, *"particularly the ways in which social relations influence ecological relations and vice versa" (p. 798)* at farm and landscape level.

Of course, this project did not conduct research explicitly investigating ecosystem services and biodiversity within the research area. However, social relational influences were laboured by several participants. For example the honey producer stated that;

> *"In our instance beekeeping has a positive impact on the environment pollinating as an examples so that side of the activity is beneficial in many ways, actively managed crops which have hives in them are 20% uplift in yields, so farmers love us, particularly if they're growing borage or rape or something like that"* – FDC7.

The direct economic rewards of placing bee hives in fields benefited the farmers who owned or managed the land; they could expect to have an increase in yield, evidence supported by Garibaldi et al. (2013) and many others, and as a result will generate more income. The ecosystem services provided by the honey bees mirrors nature's systems, the symbiotic relationship between plants and pollinators, and is similar to the organic movement's values, therefore providing an example of sustainable food related practices which are not organic.

When applying this to a business context in the food sector, the owner of the honey company stated that they did not tend to do anything without making a profit. The ecosystem service provision by the honey bees was seen as an economic motivator in order to leverage land for bee hives to be placed upon. However the company owner stated that his company did promote social relations which related to ecological benefits. This was achieved through a social enterprise initiative aimed at ex-forces personnel and encouraged them to up-take bee keeping in partnership with the bee farming association (BFA);

> *"I spoke with the BFA and said now that we're a brand we want corporate membership, but in order to get a corporate membership with them, you've got to invest in the organisation. It's not just the case that, oh you're a brand, just pay an extra membership fee, you get a corporate membership. You have to add value. We sat around the table and had a think about perhaps how we could benefit new entrants? into the industry and pay for it financially. We get a corporate membership, they get our investment to invest in this particular area or programme they're looking to set up… a smaller programme for ex-forces, who have perhaps spent 22 years in the forces and might consider our industry as something they'd like to get into".*

This social enterprise initiative can be seen initially as supporting members of the economy who are in a transition period of their career, thereby demonstrating civic quality convention (Murdoch et al., 2000), as supporting ex-forces is a particularly topical issue at this period of time given the budgetary cuts in our armed forces budget resulting in recent redundancies (Chalmers, 2016). Furthermore, the potential economic returns of having more bee hives from which to source more honey aids in assuring their production estimates and potential order commitments in future years.

The notion of uncertainty and variability was discussed by Krywoszynka in the literature review with her case study research on the wine industry (2014). However, by imposing this long-term, 'sustainable' approach to their business model, the owner of this company is showing foresight, innovation and entrepreneurism, characteristic traits needed in AFN actors. This small contribution to creating a more socially inclusive and thereby potentially economically beneficial food sector should be viewed in light of the realities of the other aspects of business activities;

> *"Decision makers view sustainability as being a must have with regards to consumer image is concerned. But profitability will drive everything. If it isn't profitable it's not going to work. Here's an example. Bee farmers, the biggest expense is diesel, getting around our apiaries. It's not very environmentally friendly is it? All of the fuel we use. But there isn't any other way to do it. We're not going to invest in electric Tesla and things like that, just go around our apiaries to reduce our carbon footprint. Can't manage the electric cars off road yet. So what we do for the environment is good, but how we manage it sometimes isn't so good. But we've been a hard rock sometimes"* – FDC7.

In this instance, we have a food and drink company which is promoting a healthier raw and unpasteurised honey, as opposed to pasteurised honey, that also makes attempts to be socially inclusive by way of supporting a group of people who may need economic and career transition support, whilst also increasing ecosystem services of arable land through their business activity. They also admit that their business model has its limitations in terms of carbon emissions. This statement reflects the accepted view that was prevalent from many of the interviewees' discussions that more could be done, there are limits to what small companies and organisations can achieve, especially with limited financial and personnel resources available.

This supports the assertion made by the Smithers et al. (2008) study that stated; “Social actors within these networks are “*often thought of as enlightened and conscientious small-scale farmers*” as cited in Albrecht et al., 2003 p. 154.

Additionally, the actor here is showing elements of reflexivity as discussed in the literature review chapter of this thesis. Reflexivity, as defined by Goodman et al (2002), is “*the political practice that can make the power of alternative economies manifest in a more inclusive and liveable world*” (as cited in Johnston and Cairns, 2013, p. 406). By promoting good practice in terms of working with farmers, and members of the community in an attempt to create net-positive contributions in the food sector, the mainstream food and drink companies may see this as a potential adoption strategy in their business models. Understandably there are limits to how much honey can be retailed, however the ecosystem services provided, along with employment and social inclusion, could be spread to many members of the society without the need to commercially retail all honey produced.

6.4.2 Further embeddedness considerations

Some of the AFN actors exhibited clear signs of social embeddedness within the AFN. Smithers, Lamarche & Joseph's 2008 assertions that social actors within these networks are “*often thought as enlightened and conscientious small-scale farmers*” as cited in Albrecht et al., 2013 p. 154, in opposition to conventional industrial operations in the food sector, appears to be evident in this case. Actors have actively gone out of their way to champion their way of food production and retail, this was evident through the interviews and the SNA and content analysis. The following quote speaks volumes to the values that were evident by the online retail cooperative manager. It illustrates the nub of sustainable agricultural systems in a sophisticated yet practical manner;

> *“We want them to have as much space as they can, we don’t want to factory farm. We could quite easily factory farm, sell our meat for a lot less profit and start ramping up the profit. That’s not what we’re about. It’s not just the profit. We’re concerned about the welfare of the animals as much as the people. If we were to factory farm it, we would have to put antibiotics into the water system, otherwise the pigs would die and it would go through the whole lot. At the moment we don’t do that, they don’t need any medication. They don’t need it. We just ring the vet if a pig is ill, we’ve only had the vet here once in three years. That was just a precautionary measure”* – AF3.

By being very clear as to what farming practices she wanted to achieve with her own produce, it is clear that this individual is demonstrating the inspirational quality convention linked with what Thévenot (2002) asserts as a commonly held view in terms of social and environmental welfare, with the social actor leading this convention through her own innovations, entrepreneurial approach, and strength of reputation.

Some actors within the network referenced their umbilical connection with the environment which sustains their business. For example, the honey producer stated in strict quantity terms how much their business stood to gain from having the right climatic conditions:

> *"If we have a good year, warm, sunny at the right time, we get a good crop, if it's the other way around and we get bad weather at the wrong time we get a bad crop, of course. To put that into perspective, 26 tonnes in 2014, 9 tonnes in 2015. And that was purely down to the weather*. – FDC7

This in itself speaks volumes for some of the most basic principles of food and agriculture; our food ultimately is dependent on seasonal regularity and predictability of our climate. Yes we have the ability to grow crops in artificial environments, however for now this is the exception and not the rule in our conventional agricultural systems. Climate change, and its effects are already impacting on crop yields, water usage, and biodiversity levels and ultimately the economics and livelihoods of actors involved (Brzoska & Fröhlich, 2015; IAASTD, 2008).

In the paragraph above the difference of 17 tonnes is quite substantial for a small business. This will mean that ultimately the economic output of that business will be a reflection of the climate of the previous year. Of course on a micro level it is almost impossible for the actors involved to do anything about the climate, however this vulnerability and uncertainty will most likely also be felt by the individual farmers and food industry on a global scale(see Adger, 2006).

The cooperative manager of AF1 spoke further on the issue of transparency within SFSCs by stating that transparency of produce and cost was an important value for this cooperative. She recalled speaking to eight local butchers on the topic of free range chickens; it was apparent that there was interesting comparisons in terms of tractability:

> *"So where do you get it from? I've got the name of the supplier, then rang the supplier and said I'm interested in buying free range chickens and they say we don't sell free range chicken. They say we used to but not now. It's not cost effective for them. So the butchers that they have sold them to are still retailing them as free range when they're not"* AF1.

This supply chain investigation narrative has shed light on some areas of supply chain management that may be difficult to verify or confirm for small businesses such as local butchers. Furthermore, it highlights bad practice to a degree, and raises the level of debate on this topic area of traceability. A local butcher may have a long standing order for chickens that come from a farm which was free range and may never have thought it necessary to confirm whether their supplier was still free range. After all, butchers receive meat in a different manner to supermarket shelved produce, where products are labelled. Animals come straight from abattoirs or farmers, and if they are not being transparent and open, or are openly deceiving their customers, the butchers, then this is a major concern for many involved in the network.

The cooperative manager is clearly indicating the need to verify where our food and drink comes from, to ask critical questions, and to be sceptical of the information we have available. As a result, she is arguably demonstrating substantial commitment to the AFN's values by way of promoting an open SFSC enquiry. When analysing Tweets by this user, it was evident that the cooperative demonstrated this same level of commitment in their own produce, as seen by Figure 16. The tweet further demonstrates the potential of AFNs using Twitter as a public platform for consumers to enquire and verify what is being claimed.

Figure 16 AF1s traceable free-range chicken

6.6 Quality and conventions theory

Notions of quality were discussed extensively in the literature review and were evident through the discussion which took place during the interviews. The quality conventions are listed as follows:

i) **Commercia**l, based on price and commercial value of goods;
ii) **Industrial**, assessing the compliance with technical standards and reliability;
iii) **Domestic**, which are related to the concepts of interpersonal trust and traditional modes of production;
iv) **Public**, concerning the importance given to trademarks and brands;
v) **Civic**, which refer to the societal and community benefits of local products;
vi) **Inspirational**, based on the value of the passion conveyed by the products;
vii) **Ecological**, relating to the environmental sustainability of the goods and the production process.

(Murdoch et al., 2000; Thévenot, 2002)

The quality conventions categories serve as a sound framework when interpreting what was said during the interview process regarding quality of product. Often interview participants would not explicitly state what they meant by 'quality', rather it was used in a colloquial manner. For example:

> *"There's a variety of reasons why people buy from us, some because we're local, some because we're organic, some because of the quality, and some because delivery, convenience, some for a mix, some trumps the others. There's no clear cut winner"* – FDC35
>
> And;
>
> *"We have a high quality product"* – RC15

The same was mentioned with regards to social media quality, in this instance Twitter;

> *"I have to make sure that what I'm putting up there has a certain quality"* – FDC3

However when specifically analysing quality conventions within the seven categories, we can see clear synergies, albeit perhaps inadvertently in some instances.

6.6.1 Commercial quality

Throughout the interviews, there was an integrative theme of commercial awareness and price consciousness. From the actors themselves saying that they purchased higher quality primary products, in this instance fresh vegetables: "*we're willing to pay more, and not just go for the cheapest, because of what we do and our culture that we want to champion"* FDC35. This demonstrates that quality is ideally present right through the supply chain, not just the end product. This carried through to being transparent about the cost of production and retail price.

The dairy producer who was interviewed discussed a recent contract they had secured with a national retailer who focused on champion 'local' producers, at regional levels;

> *"So we did an infographic, 60p for the farmer, 14p processor, our marketing costs, minimal 10p, then bottle, cap, label, distribution, so we showed it all transparently" … "So they wanted us to do this infographic, we thought it would be in the shop to show the customers where the money was going" FDC3.*

Unfortunately for FDC3, this contract did not turn out as intended and sales were "*nowhere near what we anticipated*". The producer lamented, passionately, that this retailer marketed their produce next to their own brand with a special buy two 2 litre bottles of milk for £2, whilst advertising FDC3s at £1.89 for just one 2 litre bottle. In this particular instance, it appears that the retailer was exploiting the more expensive FDC3 milk next to their own lower cost milk without displaying the transparent costings. Whilst this commercial example offers insights into the commercial challenges facing AFNs who engage with CFN markets, it also demonstrates characteristics of the Conventions Theory narrative of 'worlds of production', as discussed by Ponte (2016). More specifically, Ponte's Worlds of Innovation: specialised products, which are then retailed in a generic setting (for example online, or with a larger chain retailer such as Booths, Waitrose).

The milk producer concluded this exemplar with the suggestion that the chain retailer *"wanted to make 35%"* (FDC3), thereby contradicting the original market values of the producer "*everyone in the supply chain deserves a fair price for their work*" (FDC3). This being said, larger retailers do have the potential to expose a product to a wider customer base, and thereby potentially increase sales and overall market share for products from AFNs.

There are considerable overheads for a retailer to consider, with all costs accumulated, perhaps individual percentage demands should be assessed on a case-by-case basis. In this instance though, a somewhat deceptive approach to including 'local' produce into a national retailer appears to be done with a degree of favouritism on the part of the retailer.

This demonstrates what Goodman, DuPuis and Goodman state as; "*alternative food movements and markets coexisting in permanent tension*" (2013, p. 429). There is clear tension between this innovative, hybrid route to market, as demonstrated by the narrative from the milk producer. A national retailer who is attempting to commercialise the AFN movement's produce, should ideally also adopt the movement's values of transparency, and a fair price for all those involved in the supply chain in attempts to ease tension.

It is the case that the *"political economy of organic agriculture can mimic conventional industrial agriculture in its structure, capitalization and falls short of agro-ecological ideas due to market competition"* (Jarosz, 2008, p. 233). The Harvey lawsuit case in the United States (DuPuis & Gillon, 2009), as discussed in the literature review, helps to substantiate what is being said here by the milk producer. In the Harvey lawsuit case it was demonstrated how legislation was challenged in relation to embeddedness. In this case, the milk producer is advocating that the organic certification should take into account the farming practices, not just the end product.

Interpersonal trust and traditional modes of production is what Thévenot (2002) refers to as the domestic quality convention category. In terms of trust, being transparent with matters of finance is a substantial way of displaying domestic quality. Although a sensitive issue for commercial entities, especially when it comes to competitors who could exploit this to their benefit, being financially transparent to an extent was demonstrated by the milk producer:

> *"We supply our invoices to show how much we pay our farmers. When you say wow, that's how it should be! If you feel as though you are taking a fair margin and a fair cut. Why not show people what you're taking to cover your cost and what you're paying your suppliers"* – FDC3.

6.6.2 Labelling and regulation

When it comes to legal regulations, as opposed to industry led accreditations as described in the quote above, AFNs do not operate in isolation from industry food standards. All food and drink produced in the UK that is retailed commercially has to be accountable to regulatory and compliance standards by law. For example, the Food Standards Agency has on their website a list of general food regulations and laws: The General Food Law Regulation (EC 178/2002; The Food Safety Act 1990; The General Food Regulations 2004; The Food Safety and Hygiene (England) Regulations 2013; and Food standards Act 1999 (FSA, 2017). This notion of achieving compliance with technical standards and reliability is what gives AFNs their industrial quality and was demonstrated by multiple actors.

Returning to the previous quote by the fruit and vegetable company owner with regards to industry led regulations, another interviewee described the importance of such an accreditation in terms of generating sales. In an attempt to have their produce stocked in a retailer, the preservative and jam producers FDC9, who were on the periphery of this AFN in terms of connectivity and also posted few SD related terms in their tweets, cited the requirements of obtaining a 'safe and local supplier approval' (SALSA). SALSA has been developed specifically for SMEs and micro businesses to ensure safety standards:

> *"We're assessed by a company called SALSA, you've probably heard of things like BRC* [British Retail Consortium]*, the company was developed as a quality standard for small to medium sized companies. So that people like Waitrose, can take on small suppliers yet still have the food standards in place, and that the products they're buying are of a certain quality standard and safety"* – FDC9.

The interviewee said that having the capacity to undertake these audits, such as SALSA or the BRCs audit, can be "*challenging if you were a one-man-band, SALSA would be very hard still*" FDC9. It is pertinent to reference the challenges AFN actors are faced with, specifically those with little or no employees, when conducting business with the CFNs.

The interview with the business support representative (IF3) revealed that compliance and regulatory issues post-Brexit UK is a concern for its members:

> *"I just think that there is uncertainty at every point. What we're trying to do is call for clarity, especially around regulation, and on customs duty, trade and procedures and those sort of things. But that overall sense of insecurity is rife throughout all business, and it's stifling*

investments, because everybody is waiting to see what's going to happen. Our call to government is to have robust negotiations and provide clarity every step of the way for businesses" IF3.

Potential business support from institutional frameworks and policy makers may be directed towards accreditation of AFNs. However, how this could be implemented given the lack of organisational and physical structures is unclear given the apparent fragmented position AFNs are currently in as a movement.

6.6.3 Organic movement

Further to the issues of regulation and accreditation is the organic movement which is a topical debating point in both the academic literature relating to AFNs and also with the AFN actors themselves. Arguably the purpose of farming organically is to mirror nature's processes when it comes to food and drink production at the primary level by not using any artificial or chemical products. However there are varying degrees of opinions surrounding organic produce as a driver for SD within AFNs. The interviews revealed far reaching and contentious perceptions, ranging from full support for the organic movement, to mild scepticism of economic returns, and also a pragmatic critique with an oppositional stance attached.

In an openly biased comment, albeit from a rational perspective, the organic fruit and vegetable company owner stated that:

"I'm a big fan of think local act globally. Being someone who is a supporter of organic, we're one planet, it doesn't matter where you are. If you're faming organically you're not polluting the rivers, you're not contributing to global warming at the same level as conventional agriculture" – FDC35.

However other participants did not view the organic movement in the same light. In a rather critical perception of the movement, the milk producers pointed out that milk bottled and marketed organically did not necessarily mean that sustainable agricultural practices had been applied:

"There is a sustainability restaurant association in London. They bought this organic milk, local farmer etc… the guy has this big factory, he buys all the spot milk [milk sold out of contracts] *at 6p per lt, they bottle it and sell it to them as sustainable"* - FDC3.

We can only assume that the individual who buys out of contract milk (spot milk) at a low price is then selling this at a profit to the aforementioned sustainability restaurant association in London on the premise that the produce is 'sustainable' as it is organic. Paying a producer much less than the cost of production on the surface of this example seems unethical, and is not fit for purpose for the primary producers themselves. If it is the case that the milk purchased is all milk that was going to waste, for example due to being unsold, and there was some framework in place for at the very least giving something back to the farmer, than this method may be justifiable within the boundaries of sustainability thinking. This being said, there are clear contradictions with regards to sustainable thinking, this cannot be durable in the long term for either side involved in this supply chain.

It would be far more effective in terms or reducing the types of risks and uncertainties mentioned by the business support organisation (IF2), because farmers could better plan their resources. It is unlikely that this business model is there merely to absorb say a spring flush, whereby more milk is produced due to a favourable growing season, but rather this is a business model which is exploitative in nature, therefore paying a fair price would be in keeping with sustainable agricultural principles.
Another interviewee, the honey producer, mentioned the practicalities of ensuring organic production of honey in the UK:

> *"You can't produce organic honey in this country, bees forage within a three mile radius, and you cannot guarantee that they've not been on GM crops"* FDC7.

The honey producer expanded on this assertion by stating that:

> *"Any organic product in this country that is organic honey comes from Europe and even then that's a very dubious label they've put on there. Because you can't dictate where the bees forage, so I'm against the whole organic honey thing. Raw honey on the other hand, fine, not pasteurised, but not organic. It's impossible. There's a growing demand for raw honey, which is not heat-treated or pasteurised, it's literally spun out of the frames of the hives, as we do, and put into the jar"* FDC7.

Rather than supporting the organic movement in this particular niche product, the producer is speaking to quality conventions which are an 'inspirational' classification as they are 'based on the value of the passion conveyed by the products' (Murdoch et al., 2000). This notion of quality was expanded through referencing the benefits of their product;

> *"The health benefits, you're getting the proteins that are in raw honey, it's unadulterated, it's full of pollen, which has proteins, there's a growing following amongst hay fever suffers to alleviate symptoms. It's anecdotal but it has a massive following"* – FDC7.

Here, the producer is in favour of producing a product which has health benefits rather than being preoccupied with the organic nature of the product. This compares with the milk producer and their references to selenium content in the milk being more important than just one facet of production, i.e. organic.

As for the economic considerations regarding production of organic produce, the company that produced preservatives and jams spoke in strict financial terms in relation to adaptation, and less so on the organic movement values as a whole:

> *"So we could make organic, it would cost at least 50% more a jar. Do our wholesalers want it? No, thank you. So we wait for them to say "we're getting substantial demand for organic", they want fruit and veg, but not a jam yet. We'll only do it if the demand is there, otherwise, we could destroy our business. There are substantially greater cost implications for organic raw materials"* FDC9.

It should be noted that this particular food and drink company was an SME, they employed a number of staff, although in very specific roles, and it was very much the case that two individuals did much of the business management themselves. Interestingly, noting their reference to what their wholesaler wanted, one of their retailers, an interview participant of this study who obtains FDC9's produce from a wholesaler, substantiated this assertion by stating that there are *"very few people who want to source organic"* - RFS1.

Although not explicit and not generalisable to all products stocked at this farm shop, a further indication of what AFN consumers want, specifically for this specialist AFN Farm shop participant, again seems to be more concerned with the growing and rearing conditions of the food rather than organic:

> *"For example organic corn fed chicken, it looks all yellow because it's organic and that's the way it looks. People would buy a free range chicken that is less expensive and looks how they think a chicken should look. So yes there is a need for some organic just as much as there is a*

need for gluten-free for example, but it's not the driving force of the business. We never go out there and say we're organic. It's more about how the food is produced, like sometimes the grass fed beef" RFS1.

The milk producers (FDC3) have their produce stocked in this farm shop, they independently verified the type of consumer whilst also referencing the relationships they have with them:

"My sister and I will be going there ahead of World Milk Day June 1st, so we'll do something before then and talk to their customers. So when you go in to taste things and go do events. You're going to speak with people who are already conscious of where their food comes from; provenance, sustainability. So it's very easy to have that relationship, and talk at length to people about it" FDC3.

The farm shop identified themselves as *"£50 shop"* (RFS1), suggesting that customers typically spend £50 there, which might imply that their customers were solely from a higher socio-economic demographic with high levels of disposable income. The notion of being a £50 shop was independently, and without any prompts from the interviewer, confirmed by the honey producer (FDC7) who also had their product stocked in the farm shop. Furthermore the farm shop stated that:

"We get a real mixture of customers, of course, you're going to get your top end demographic in terms of spending, and they're probably the ones who mix their shopping between here, Marks and Spencer, and Waitrose. Then there are a lot of people who are the food lovers, who come here for an experience, or gift lovers, but also spend when they're here" RFS1.

Thereby, in this case, supporting studies such as Lockie (2008) whose research also indicated that there was no clear relationship between wealth and greater consumption of organic food as both high value customers and 'food lovers' alike do not have strong calls for organic produce in this farm shop.

At this stage of the discussion and analysis on the organic movement, it is worth noting that the one AFN interview participant who produced organic produce also had a great deal to say with regards to organic produce and be socio-demographic of consumers, and further supports Lockie's (2008) studies by stating that *"Our assumptions on who we thought our consumers would be are absolutely not who we thought they would be"* RDC35 and also:

> *"Well we put fliers out in all the most affluent areas in and around Chester, Frodsham, Tarporley, anywhere we thought would like us. We got very little response, we definitely thought it would be middle-class, middle-upper, who would buy our stuff, but actually it's a real mix of demographics, we deliverer a reasonable amount of boxes to Blacon* [suburb of Chester with a mix of private homes but also substantial public council homes*] each week, I would never have thought we would have delivered a box to, really. So it's a lot more balanced across the socio-economic spectrum than I ever thought it would be. Interestingly since then, I've read through some of the Soil Association organic reports and it's always been thus, there's always been a perception that it's a middle -class interest. That's a construct of the media, it's not the reality"* - FDC35.

The organic fruit and vegetable provider presents an interesting and real-to-life summary of their consumer and customer base by saying that they come from a mix in demographics, somewhat challenging the early research on AFNs and consumers by DuPuis and Goodman (2005) who framed actors who involve themselves with AFNs as middle-class and affluent. However, DuPuis and Goodman's (2005) research was conducted some time ago and is not the only academic source on this issue.

6.7 Chapter Conclsuions

Although the dichotomous relationship between CFNs and AFNs has advanced in the literature, it was evident from participants that there was still a notable divide. The unrealistic cost of food and the subsequent price squeeze from supermarkets and chain eateries was laboured by multiple interviewees. It was illustrated by the dairy producer (FDC3) how social media can be a conscious raising tool to publically challenge assertions made by CFNs which may have previously not been as easily achieved without the use of social media (Allen, 2010). As such, this is supporting Bos and Owen's (2016) assertions supporting the usefulness of virtual reconnection using social media within AFNs.

This being said, it was also apparent that there were some synergies between CFNs and AFNs in the shape of hybridity, for example the independently owned café (RC15) acknowledgement that diversity in the market place helps them to differentiate from CFNs.

Therefore, it appears that there are some distinctive differences of opinion towards CFNs from the perspective of producers of the food and drink, and the retailers. This suggests that the literatures movement away from the dichotomy of AFNs vs CFNs is warranted, however the divide cannot be ignored.

When discussing SFSC and localness, from both the literature and the interviewees' perspective, it seems that the AFN movement values in general were more pertinent to the success of the AFN than the geographical local area.
Production methods were seen as more important over food miles for example (Edwards-Jones et al., 2008), therefore supporting claims in the literature that suggested that AFNs were more than just a local movement. The degree to which territory and geographical distinctiveness was important should further be considered.

An important issue of concern from the interviewees was their views towards intermediates. Mixed opinions as to the usage of intermediates was expressed, from supporting the use of them to get a product to market, to rejecting their use due to the principles of the AFN movement such as reconnection, and transparency (O'Kane & Wijaya, 2015). Issues of frequency of delivery and obtaining a fair price for the produce were cited as limiting factors to engaging with intermediates. However, the narrative from the preservatives food and drink company (FDC9) provided a different perspective in terms of a business strategy that saw the use of intermediates as an economic trade off in terms of resources used to get their product to market, thereby promoting further the notion of hybridity within AFNs. A challenge to the literature here comes from the notion that intermediates can be seen as compatible within current AFNs if done in a way which is considered in its approach.
Intermediates should be considered as a viable option for AFN actors, providing the intermediates share the same movement values as AFN actors. For example, the AF1 cooperative intermediate offers an example of this in practice.

The commercialisation and marketisation of AFN movement values by CFNs (Goodman et al., 2013) was discussed through the dairy producer's narrative of contract acquisition and the challenges they faced. This was perceived to be a negative phenomenon from the perspective of some interviewees as the commercialisation and marketisation of the AFN movement was done without appreciating the triple bottom line principles of SD of economic, social, and environmental equilibrium throughout the food supply chain. Through the example of conflict between the two food cooperatives, this conflict speaks to Watts et al (2005), which highlights the fractured and somewhat disjointed nature that

appears to be prevalent in AFNs. It was discussed that a potential reason why conflict and a low level of density in the network exists could be attributed to a lack of organisational and physical structure coordinating AFN activities, as highlighted by Cleveland, Müller, et al. (2014).

Actors within this AFN appeared to substantiate the claims made in the literature that they are conscientious and reflective in relation to the SD agenda (Albrecht et al., 2013; J. Johnston & Cairns, 2013).
It was evident that there was a thorough level of connection with the environment and the societies who are involved with their business activities from all participants, thereby exhibiting the inspirational quality convention (Thévenot, 2002).

Clearly distinguishable characteristics of Ponte's (2016) Words of Production (see Chapter 3.3.4.2) were evident in the interviewees, however it was clear that these needed to be better understood in a more applied setting. For example, the dairy producer (FDC3), classified in the 'Word of innovation', however in reality they found it difficult to act in this hybrid manner (of being AFN producer retailing through a CFN actor).

Labelling and regulatory compliance was seen as an issue for AFN actors. The company size and resources available in order to conduct additional accreditation such as SALSA was cited as a major decision making factor. As a result, the main summative point here would be to ensure that the realities of sole trader, micro, and SME AFN actors are taken into account where accreditation or regulatory compliance is needed.

The discussion and analysis regarding the organic movement revealed that participants were conscious that, much like the local debate, organic produce must be produced in a way which is ethical and sustainable, for example the seemingly unethical business model was presented and discredited by interviewees. Further to this, the findings of the DuPuis and Goodman (2005) who framed organic consumers as middle-class and affluent were challenged by the organic fruit and veg producer, thereby supporting research of Lockie (2008) who claimed similar findings.

Chapter 7. Conclusions and Recommendations

"*Insight, untested and unsupported, is an insufficient guarantee of truth*"

Bertrand Russell,
Mysticism and logic (1929)

7.1 Chapter introduction

This final chapter concludes the research by way of drawing together a final summary of this thesis. It should be seen as an extension to the findings as it provides limitations, suggestions for future research and general recommendations.

7.1.1 Objective of the chapter

The purpose of this chapter is to achieve the fourth objective of this research: Provide conclusions and recommendations which aid in the understanding of AFNs in an online and offline setting in order to aid further research, theoretical development, and potential policy implications.

7.1.2 Structure of the chapter

The first section of this chapter is concerned with a recap of the entire thesis chapter-by-chapter. Secondly, the main findings of this research project are presented along with implications for practice and policy, where applicable. Thirdly, the research aim and objectives are reflected upon. Fourthly, the limitations of this study are presented, which are chiefly concerned with the SNA, interview participant selection, and data analysis. Finally, recommendations for future research are presented, along with reflection on the research process.

7.2 Summary of previous chapters in the thesis

Chapter 1 served as an introductory chapter to the thesis. The chapter started with an orientation and overview of the research project covering general statements and justifications for study that were of importance to the topic area. The chapter summarised the focus of this research project, including a statement of the aim and objectives for the research. Chapter 2 provided this thesis with the background context of this research. An introduction to the SD agenda is presented, defining SD in its broad context, and then in the context of food and agriculture.

In Chapter 3 the two theoretical underpinnings of AFNs, Conventions Theory and embeddedness, were critically examined, thereby establishing the need for further research. Chapter 4 covered the methodology of this thesis and indicated the adoption of a constructionist ontological stance, with an interpretivistic epistemological position. SNA and content analysis was used in order to select suitable interview participants, and the transcripts of these interviews were analysed using template analysis. Chapter 5 described and explained the SNA that was undertaken in order to obtain an understanding of the AFN in Chester and its region. The SNA of an AFN is an innovative aspect of this thesis. Chapter 6, the discussion and analysis chapter, synthesised the theoretical underpinnings in AFN literature and the data collected from the AFN of Chester and its region.

The summary of the previous chapters in this thesis indicate that the findings of the data collection and analysis were based upon a thorough literature review on this topic area. This thesis therefore has a strong foundation to provide conclusions, recommendations and suggestions for future research that are valid.

7.3 Summary of main findings and implications

The main findings and subsequent implications are presented in no particular order.

7.3.1 Finding 1: Need for physical structures and organisational support

A finding of this research was the need for more physical structures and organisational support for AFNs. It was indicated by Myers and Sbicca (2015) that there is scope to develop a greater understanding of how AFNs can be scaled up and operated on a larger scale. The results of this study suggest that if AFNs were organised with greater physical structures and organisational support, they would be well placed to be scaled up and mainstreamed. However, in answering Levkoe and Wakefield (2014) who called for deeper understanding of how networks assemble without centralised structures, the use of social media can be seen as a potential solution to this. Social media can be used as a reconnection medium, as dialogue and discussion on a given topic of interest can take place without organisational structures. Interview participants expressed reservations to industry led regulations, and as a result, perhaps a third party actor could act as an impartial medium, for example an institutional framework actor (such as IF1 and IF2).

As a result of the SNA, literature review, and interviews conducted with the AFN actors, it is apparent that AFNs are in fact an alternative rather than oppositional force as highlighted by Sonnino and Marsden (2006b). They are not sufficiently mainstream enough to make a considerable opposition at this time as they do not have a vast market share. They do not appear to be particularly well organised or indeed well connected, as the density of this network somewhat indicates. Examples of conflict from AFN actors who had the same values and overall ambitions show that this may be a typical occurrence. Furthermore, it was indicated that there was a level of fragmentation within the food sector, even amongst AFN actors and that this issue needed to be further investigated, as highlighted by Goodman et al. (2013). The fragmentation within this particular network was evident when viewing the relatively low levels of connectivity as shown in Chapter 5. However, there is limited evidence to suggest that social media, in particular using Twitter, would be the best or only solution to this fragmentation.

7.3.1.1 Applied recommendation of public procurement

There is evidence from a study conducted in the United States which demonstrates how institutional public procurement of locally grown foods can be seen as a necessary support opportunity to aid locally based food and drink producers (Izumi et al., 2010). This was further laboured by Roep (2006) in their EC report concerning rural development and supply chains: "*the role of public-private partnerships that contribute to a sustainable development of 'their' region is often a key issue that needs to be addressed*" p. 23. Further to this was the SFSC research conducted by Renting et al. (2003) who stated that "*development through the evolution of SFSCs must be based upon both institutional support and new types of associational development involving a range of actors operating within the chains and their surrounding networks"* p. 408.

A recommendation at this stage would be to have public procurement of food and drink products a mandatory requirement, examples of this could be food sourced for public services and departments such as schools and councils. As has been identified, the United Kingdom is facing a period of uncertainty with regards to Brexit, and it would be an astute move in a socio-economic dimension if we ensured that procurement of food and drink had a direct correlation to territorial economies. When considering the institutional framework's that are linked with AFNs, Sonnino and Marsden (2006) stated that "*few case studies that have focused on the political and regulatory context of those networks help to identify the type of political action needed to stimulate and consolidate the alternative food sector"* (2006b, p. 192). This research proves to be a timely acknowledgement of the call for further research on this topic area. In terms of vertical integration within the AFN discourse, the notion of reflexive governance has been a subject of attention by Marsden, who stated that *"it will be necessary to create policy spaces for more place-based forms of reflective governance"* (2013, p. 130). Given the potential reframing of the UK economy post Brexit, this collaboration may be a welcome development from the viewpoint of many actors involved. However, at present, there is no compelling evidence to suggest that the UK government support such suggestions, there is still too much uncertainty with regards to future trade arrangements with the EU and others such as the United States or Commonwealth nations.

When referring back to the example of public procurement by the milk producer, we must be realistic and recognise that it is in the best interest financially for some organisations to ensure consistency and reliability of their supply chain. Even if it is the case that concerns over procurement from smaller, less traditional suppliers are imagined and not supported by evidence, institutional organisations need to develop trust and reconnection with their suppliers. This will not only help to strengthen financial

ties, socially and culturally it may lead to a greater respect and understanding of where our food comes from, and an appreciation of those making it.

However for now, as highlighted by several interview participants, there are limits on the influence that the alternative movement has as a whole. There are big pressures from conventional industries to contend with, such as subsidising the cost of bulk or multi-buy orders, and the conventional industries are well financed and connected, and have established themselves as mainstream which is why they are used.

If sufficient guidelines were put in place to ensure that procurement of local food produce (where possible) was done in a manner which embraces the SD agenda, whereby companies had to demonstrate their social and environmental commitments, then this could be a consideration for policy makers in the near future. A set of guidelines could use quality conventions, such as those developed by Murdoch et al. (2000) and Thévenot (2002), and embeddedness principles (Dansero & Puttilli, 2014) as a framework. If we had an approach to public sector catering and food provision that champions our food sector, a potential multiplier effect could occur whereby more food related businesses change their practices to secure contracts.

What is being suggested here is a new approach to the way in which actors throughout the supply chain can have greater influence on how much they can receive for their efforts. This problem is not limited to AFN primary producers for example, conventional suppliers experience 'lock-in' with their buyers and also have limited influence (Nousiainen et al., 2009). In order to achieve this, or at least bring the debate into the forefront of policy makers decision making processes, chiefly at this time in the United Kingdom, it is worth considering the alternative economy discourse as led by Sonnino and Marsden (2006a) for some time. When considering the institutional frameworks that are linked with AFNs, Sonnino and Marsden also state that the "*few case studies that have focused on the political and regulatory context of those networks help to identify the type of political action needed to stimulate and consolidate the alternative food sector*" (2006b, p. 192), thereby justifying more research into the possibility of public procurement of AFN produce.

7.3.2 Finding 2: SNA an effective tool for participant selection

A second finding is that SNA can be an effective data collection tool for the selection of pertinent research participants. SNA was conducted in order to generate research participants to interview who were pertinent and of value to this research. The method of conducting the SNA was designed in order to be replicable, and transferable to other research contexts or geographical territories, thereby adding a degree of validity to the participant selection. After the SNA was conducted the content analysis helped to refine the search for suitable research participants for interview. The selected interviewees were selected so as to offer the maximum benefit for qualitative enquiry and in depth insights into AFNs in relation to the SD agenda. Although SNA was a lengthy process, and it was also acknowledged that only one social media platform (Twitter) was used, it did offer a low cost and replicable way of ascertaining potential participants. The method demonstrates to future researchers that participant selection does not have to be random, or based on factors such as: companies who are known to the researcher or institution; those who answered contact requests; random sampling; and other unrepeatable methods. Results in science that cannot be replicated offer little value for future researchers aiming to expand upon or challenge the findings of a particular research study. Therefore finding that SNA works as a method of obtaining suitable potential interview participants should be acknowledged as a methodological contribution in the context of AFNs.

7.3.2.1 SNA in an applied setting

Finally, in terms of practical business implications of this finding, AFN actors can exploit the method of SNA used in this study to gain an understanding of their own market position, albeit in an online setting. If AFN actors target key individuals within a given online network of actors, they may find that they will have greater levels of connection with likeminded businesses. This could be extended to other geographical areas as online platforms are global, especially through the use of hashtags and keyword searches. AFN primary producers may find potential retailers for their products using investigative methods of enquiry such as SNA. The dairy producer (FDC3) cited that they obtained business from a Twitter message to a care home and as a result gained a longstanding contract. They could replicate this by searching for other potential customers who share their product's value for example. With regards to customers, similar marketing strategies could be developed in order to attract likeminded customers and make them aware of an AFN actor's business. This would be time consuming and require practice and precise search criteria, however it could be achievable given a reasonable timeframe and competency using this methodology.

7.3.2.2 Using social media to demonstrate how to reveal actor relationships in AFNs

Using social media as a participant selection strategy has enabled this research to identify key actors within the Chester AFN, analyse the content that they have produced and ultimately enable the subsequent qualitative research to take place (e.g. interviews). The relationships between actors within the Chester AFN have been outlined using the SNA examining online ties. These valuable insights into online connections are seen as an initial data collection stage, from which the researcher has an informed base of knowledge from which to draw information from. This being said, the online connections only tell the researcher so much by way of relationships between actors. What is needed is further analysis into the physical, offline relationships between actors. However, the unique opportunity to have a rich amount of information from a social media platform is an insight into an organisation that scholars can use in order to develop insights and understandings of the publically available communication published.

7.3.3 Finding 3: Quasi-dichotomy between AFNs and CFNs

A third finding was that there was still an element of dichotomy between AFNs and CFNs in regards to the two food networks being oppositional to each other. For example, it was revealed that obtaining purchasing contracts with potential buyers and retailers of AFN products was seen as problematic. The milk producer (FDC3) cited an example of having their contract cancelled as a result of potential uncertainty of delivery, however the owner explicitly laboured the assertion that the intermediate cancelled as a result of pricing. This suggests that the CFN actor in this instant did not share the same values as AFN actors. Additionally, the online retail cooperative (AF3), stated that many local eateries did not want to pay a fair price for products from local suppliers, in essence wishing to commercialise the market values of AFNs without returning the proceeds to the primary producer.

As outlined in section 5.6.2.1, the SNA measured AF1 as having one of the highest eigenvector centrality measurements and was ranked 8th in terms of overall centrality in this network. Consequently, and combined with their unique position of being an AFN cooperative, it is likely that AF1 has some expertise from which to comment from. Therefore, subjectively speaking, this trend may be typical amongst many AFN actors. Subsequently, it appears as though pricing considerations are major barrier precluding integration at the retail level between CFNs and AFNs.

This section of enquiry has helped to better understand the producer's point of view about the redistribution of economic value along the chain and their bargaining power on price as highlighted as a suggestion for future research by Berti and Mulligan (2016).

The contribution in this area comes knowing that in this specific geographical territory, and for the selected AFN actors who were interviewed, it is still acknowledged that problems were prevalent between CFNs and AFNs regarding price. This is an important complement to the current understanding of AFNs based on a dynamic study area in the United Kingdom. The emphasis on generating a wide range of AFN actor perceptions has lead this research to be far reaching in its contact with practitioners.

In a practical context, AFN actors may find it useful to have an appreciation of the difficulties involved when dealing with CFNs or intermediates in general, and thereby be better informed of the potential risks and challenges they face. This could be achieved by compiling a best practice guide of problems and potential solution strategies when engaging with CFNs.

7.3.4 Finding 4: Mixed views towards intermediates

The literature suggested that the reduction of intermediates was seen as a desirable aim for AFN supply chains as it enabled the primary producer or manufacturer a greater level of control over the marketing strategy and price, whilst also enabling reconnection throughout the value chain (O'Kane & Wijaya, 2015). Contrary to Berti and Mulligan (2016), who suggest intermediates remove reconnection efforts made by AFN actors, this research has found that where intermediates between the producer and retailer exist in keeping with AFN movement values, this is not the case. AF1 is a pertinent case in point, therefore intermediates should be considered as a viable option for an AFN actor. A further finding in relation to intermediates is that certain business strategies take into account the need to employ the services of intermediates such as wholesalers in order to get their product to market. The preservative producers (FDC9) laboured the trade-offs between expenditure of marketing and distribution to retailers vs using intermediates.

However, the narrative from the preservatives food and drink company (FDC9) provided a different perspective in terms of a business strategy that saw the use of intermediates as an economic trade off in terms of resources used to get their product to market, thereby promoting further the notion of hybridity within AFNs. A challenge to the literature here comes from the notion that intermediates can be seen as compatible within current AFNs if done in a way which is considered in its approach. Intermediates should therefore be considered as a viable option for AFN actors, providing the intermediates share the same movement values as AFN actors. For example, the AF1 cooperative intermediate offers an example of this in practice as they are a cooperative retailer of AFN food and drink produce.

7.3.5 Finding 5: Smart localism is needed

A concurrent theme throughout this thesis has been discourse and analysis concerning local produce. It is apparent through the developments in the scholarly debate on this topic and also independently verified to an extent by the interviews that were conducted, that we need to be 'smart' in the way that we champion local produce. Smart localism is a term that the author of this thesis is presenting as a way of conceptualising notions of quality and worlds of production as outlined through conventions theory, and also the debates concerning SFSCs and embeddedness. It is clear that there is an understanding that local procurement does not mean that there is anything ethical or sustainable about the production, manufacturing, distribution, retail, or consumption occurring.

Of course, as revealed in the discussion and analysis chapter by several of the participants, just because a food and drink company or manufacturer is locally based, this does not mean that its products are of a good quality or that they are operating in line with the SD agenda.

Furthermore it will not be possible to procure all foods from local sources due to the climate of the UK making seasonality a concern as well as then excluding imported foods. With traditional debates surrounding the limitation of intermediates, and a focus on territory being the two characteristics of SFSCs, we have seen that this is a complex issue full of contention. Some actors actively see intermediates as a way of getting their produce to market in a way which is economically viable for their business model. Others see the profits lost due to these intermediates as being unfavourable. Further to this is the potential of online retail, along with social media, to introduce new dialogs of connection within this traditionally face-to-face food sector. This being said, the complexity and individual differences between food and drink companies invariably leads to the conclusion that one size does not fit all in terms of theory.

The debates surrounding localness and AFNs demonstrate that territoriality is not a major consideration of AFN actors, rather the production methods, and notions of shared values are more important. Nevertheless, it is still apparent that supporting local producers is important, and therefore a phrase that can summarise these sentiments is a term coined by the author of this thesis; smart-localism. Smart localism can be applied to situations where actors within an AFN engage with one another on a local level, with an understanding and consideration of production methods and shared values rather than just having a territorial basis as a connection.

Smart localism should be viewed as an extension of the second characteristic of SFSCs; there should be an effort to minimise the amount of intermediaries within the supply chain of the AFN itself. Also, 'shortening' relations irrelevant of spatial dynamics and in favour of supporting alliances that are value-laden and ultimately reach the consumer, which are "*based upon equality, collective interests, mutual trust and a fair distribution of revenues, costs and power"* (Roep, 2006, p. 14). What is different about smart localism is the territoriality focus. Some AFNs actively want to support other local actors, the sense of value placed on face-to-face interaction as a mechanism for aligning AFN actors together is important (Renting et al., 2003). It is especially important addition to integrations of spatial, economic and social proximity dimensions (Barbera & Dagnes, 2016).

For example, a specific geographical area may have a tourism niche as a result of particular culinary output, and as a result of this economy visitors to the area may wish to see different producers, and those involved in the supply chain if possible. An example of this could be in the olive oil industry in southern Spain, where growers of olives may take their produce to a local miller, who then buys the olive oil, then bottles it and then markets it as a geographically specific product.

7.3.6 The paradox of Alternativeness and a move towards mainstream

Throughout the literature on AFNs, there has been the general consensus that AFNs and their sustainable development based approach to the food sector should be mainstreamed or at least grow in market share. However, there is an evident paradox in these assertions, as for some time now there have been calls of concern regarding the tension between the marketisation and commercialisation of the movement's values (Goodman et al., 2013). Therefore, any future attempts of mainstreaming the values which underpin AFNs, such as fair trade, fair price for production, limitation of intermediates and environmental stewardship, must be implemented as a central theme rather than a 'bolt-on' additional feature as a marketing ploy.

What is clear from this research is that we have many food actors who are competing against not only themselves, but the conventional food sector, and until there is a joined up and considered approach to mainstreaming AFNs, then the challenge is significant. What is more, at present, there is a niche consumer base for products which are considered to be that which are produced and retailed by AFN actors, as a result AFN actors are often competing against each other for a finite market share (Watts et al., 2005). Unless there is the demand for food and drink which is ethically produced, through environmental stewardship principles, and is also supported by legislation and compliance by government, then it is difficult to see how 'alternative' can become 'oppositional', never mind 'mainstream.

7.3.8. Overall impact of the research

This research has already contributed to current scholarly discourse by-way of a conference presentation at the Royal Geographical Society's International Conference in August 2017. Elements of this research such as the methodology used and some preliminary findings were presented. This has been met with an invitation to present the findings in August of 2018. This thereby demonstrates the preliminary stages of the potential transferability of this research into the wider scholarly community.

On a theoretical basis, this thesis contributes to the existing understanding of AFNs, such as virtual embeddedness, from scholars such as Bos and Owen (2016); Wills and Arundel (2017). An innovative approach to mapping AFNs in a virtual space has been achieved through the SNA thereby resulting in subsequent content analysis to occur. The impact of this research has resulted in an appreciation for the examination of social media connections especial as they tell us a great deal of information about an actor within a network such as promotional and communicative interactions within AFNs. At the time of writing, there has been scant usage of using SNA in relation to AFN related studies, and as a result it is hoped that future scholars may build upon and improve the approaches used in this research in further research.

The qualitative interviews conducted in this research raised awareness of the perceptions of key actors within the research area and provided insights which were synthesised with the AFN literature. The insights gained from this research revealed a network which was fragmented by way of connections with little physical or organisational structures in place to support the AFN movement as a whole. This may suggest that actors within an AFN may not themselves be conscious that they are part of a much larger food movement, and more the case that their own individual decisions and values are central. This then raises the question, do AFN actors know that AFNs exist? Furthermore, as indicated by Gunderson (2013) who promotes the notion that ultimately AFNs are more conventional than they initially appear to be.

7.4 Research Aim and Objectives

To recap, the research aim and objectives of this thesis are restated and critically examined in relation to their achievement. The research objectives were selected in order to aid in the successful completion of the overall research aim. The objectives are described and explained as follows:

Objective 1: Contextualise the need for the research by critically examining the literature concerning alternative food networks in developed economies.

This objective consisted of a critical examination of the literature pertaining to the topic of AFNs in developed economies. This was chiefly achieved through Chapter 3, the literature review; *Alternative Food Networks an evolving theoretical landscape*. This chapter examined the two main theoretical underpinnings of AFNs; Embeddedness and Conventions Theory, enabling the research to formulate a sufficient understanding of the topic area which in turn helped inform the methodology chapter (Chapter 4), and subsequent discussion, analysis, conclusions and recommendations in relation to the data collected.

Objective 2: Explore AFN online practices by using a social media platform from which to gain an understanding of sustainable development related content and actor connections in general terms.

Objective 2 was fulfilled by conducting SNA on the Twitter-based AFN that is present in Chester and its region. This was evident in Chapter 5, *Social Network Analysis: A case of Chester and its surrounding area*. Here a small study of an online AFN using Twitter was explored. However, prior to conducting the research in this chapter, the methodology chapter (Chapter 4) presented a clear account of the research philosophies and research design of this thesis which helped to inform the rationale behind Chapter 5.

Objective 3: Critically evaluate AFN actor perceptions of sustainable development from an online and offline perspective in relation to current scholarly discourse.

Objective 3 was primarily concerned with the analysis and discussion of the information acquired through the literature review, the SNA, and the interviews conducted with AFN actors. This was achieved through Chapter 6, *Discussion and Analysis; triangulation of social network analysis, interview results, and existing scholarly discourse*.

Objective 4: Provide conclusions and recommendations that support the understanding of AFNs in an online and offline setting in order to aid further research and theoretical development, and identify potential policy implications.

With the successful completion of objectives 1-3, this research then focused on providing recommendations concerning AFNs in this context, this is achieved through this chapter, 7, *Conclusions and recommendations*.

Research Aim: To investigate the role played by online (social media) connections as a means to enhance the understanding of alternative food networks in the context of sustainable development. The author feels that as a result of completing each of the objectives set in this research, this thesis has achieved its overall aim. The thesis has demonstrated that social media, in this case Twitter, can be used as a methodological advantage in obtaining participants for further research. The content analysis which took place using the tweets aided this process by providing an understanding of the SD related terms used by AFN actors.

Furthermore, when graphically depicting what a given AFN network looked like, SNA was instrumental in providing an indication of virtual embeddedness of this network. Furthermore, the SNA and content analysis enabled this research to acquire research participants who were AFN actors in a contemporary and geographically specific location. The subsequent analysis and findings of these interviews enabled a greater understanding of AFNs in the context of SD.

7.5 Limitations of the research

7.5.1 Inclusion and Exclusion criteria

A limitation with the social network analysis and subsequent socio-gram produced was the inclusion and exclusion criteria. One exclusion criterion was that individual people were excluded from the sociogram, but rather only businesses or organisations would be included. This was done with the recognition that the researcher had a limited amount of time available to conduct this section of the research, and was working in isolation. Some of the food and drink organisations and businesses on Twitter some had several thousand followers, thereby eliminating the thousands of individual peoples on their Twitter pages was done as a necessity. However, after conducting one interview, with the city centre café owner, it was apparent that some AFN actors who ran businesses had their own personal Twitter account as their business one, or simply listed their name as the username. As the sociogram and SNA was conducted prior to the interviews, it was not possible to include these participants in the sociogram or conduct content analysis on them as the time difference meant that ‘followers’ and ‘following’ lists would be inaccurate and hamper the validity of the data collected.

This being said, the individual butcher in question had 26 followers who were already in the sociogram, and several of them stocked the butcher's produce on their menus. Examples of further data collection such as this could have been exploited and more in-depth data analysis and thereby further conclusions could be drawn from this specific network.

7.5.2 Participant obtainment for interviews

If this study were to be conducted again, the researcher would make better use of the existing participants in order to act as a reference or endorsement to say to other potential participants that they trust this person will not waste their time, will preserve their anonymity, and that their view as participants is important to the success of the study. It was envisaged that the participant information sheet and invitation letter would convey a sense of openness, trust, and honesty, especially given the ethical considerations that went into this stage of the research design. However, it is possible that some participants, who perhaps were time constrained, may have not even read the participant information sheet. They may have seen that the research was conducted in the context of a University student's thesis and potentially thought that the study was not for them in whatever way. As researchers we must accept that some participants just do not want to take part, even if it is apparent to the researcher that the potential participant is of importance to the study. Therefore by using the SNA, we as researchers can further support the rationale for selection key potential participants, which in turn could inform the participant of their significance.

As a result of the setbacks in obtaining participants, this study benefited from having a large number of other suitable potential participants to invite for interview, or conduct a focus group or send out an online questionnaire survey. This then demonstrates that the potential for this step in the participant selection phase of the research design can be viewed as a prudent step in conducting research in the context of AFNs.

With the difficulty of obtaining participants for interview, it may have been appropriate to have a contingency plan for potential participants who did not have the time to commit to the interview. This could have been achieved by way of an online questionnaire survey, asking some specific questions for that individual actor, or as an AFN grouping type (the Food and Drink Companies for example). This would have meant that even though an in-depth interview could not be conducted, at least the researcher may have had the chance to get some further information from the potential participant, thereby strengthening the thesis as a whole.

7.5.3 Lack of generalisability

A limitation of the enquiry into AFN engagement with others is that the results cannot be generalised in their present form. There were only 109 actors in this food network, only nine of these gave interviews. Furthermore, of these nine, not all of the actors mentioned discussed this issue fully and at length, therefore not as much detailed analysis of this issue was possible. If the research were to be conducted again, a follow-up set of questions would be considered on this topic area, and also a greater number of actors could be selected for enquiry. Given the lengthy process of interviews, and the dependence on participant cooperation, an online questionnaire survey would be a suitable alternative data collection methodology. This would enable many more possible responses, and questions could be sequential on a given topic given a correctly designed study. This being said, the SNA methodology is transferrable to other contexts and territorial areas, thereby allowing for potential generalisability if further research was conducted on a larger scale.

7.6 Suggestions for future research

7.6.1 Leadership within AFNs

It would be interesting to examine leadership in the context of AFNs as few studies have focused on this issue and it was apparent from the results of this research that this issue was mentioned scantly. Social embeddedness literature has highlighted the importance of local food actors to encourage positive change and promote possible alternatives in the food sector through their entrepreneurial spirit (Allen, 2010). This research indicated a number of actors who in some regard could be considered as ‘champions’ of the AFN movement, particularly AF1 and FDC3, although this is a subjective assessment at this stage. Future research should aim to develop a deeper understanding of the leadership styles, traits and attributes that are pertinent and of value in this context.

7.6.2 AFN dealings with CFNs

Further research into this area should consider what the determining factors which related to successful and unsuccessful business dealings were with CFN members. Research could enquire into both CFN and AFN actors in order to get a dual perspective on this matter. This would help to gain an explicit understanding of what should be done in order to further support Tregear’s (2011) calls for new boundaries within debates and exchanges surrounding AFN discourse from a CFN perspective.

7.6.3 Intermediates

With regards to intermediates within AFNs, further research should be aimed at understanding the role of them as potential drivers for expanding and mainstreaming AFN produce. It would be interesting to know the extent to which intermediates such as wholesalers or chain retailers follow AFN movement values and aims. This research would shed further light on this overlooked area of study and support or reject the findings of the research on this topic area.

7.6.4 Expanding social media and SNA

This research focused on the use of Twitter as it was a pertinent platform to explore at the time of data collection. Further study may benefit from examining different platforms such as Facebook, Instagram, Pinterest, and LinkedIn. The social media platform itself is not the key determining factor, rather it is the connections which exist between AFN actors in general terms. However with the fast changing nature of technology, Twitter may possibly be replaced or abandoned in the near future.

Future social media related research concerning AFNs would be to examine customer interaction with SNA. As stated previously, this study was constrained by time and a single researcher which prevented it from conducting a larger level of SNA including customers and consumers relating to AFNs. Future research should examine this aspect of AFNs as they are at the consumption end of the value chain and play an important part in interaction both online but offline also.

SNA could also be conducted with a view to understanding the direct economic benefits of the online social network. An investigation into the sales generated through online interaction using social media would serve as an important logical step in research as this may prove to be a pertinent business opportunity for AFN actors.

7.7 Reflections regarding AFN Actors

Subjectively speaking, the author of this thesis did not get the sense that interview participants took the view that they should be entitled to support from consumers and customers simply because they were alternative or even just independently owned and locally based. Rather, the researcher found that the interviewees professed a level of pride in their business which made them distinctive and unique AFN actors. It was also clear that each of these companies did not feel as though they were entitled to support or any special attention just because they were different from the conventional food networks. They were simply aspiring to conduct business in an ethical and sustainable manner.

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Appendix 1 Journals Reviewed

Peer Reviewed Journals	No	Methodology			Territory	Theoretical Approaches	Thematic areas
		Quan	Qual	Mix			
Agriculture and Agricultural Science Procedia	1	-	-	-	ITA,	CT	AFNs, QLTY,
Agriculture and Human Values	23	3	3	1	AUS(2), AUT, CAN, CHN, FIN, NLD, NZL (3), UK(3), USA (9)	ANT, ASSEMUBT,CT, CV-ENG, E-EMB, FD-SOV, GEN-I, HI, LOC-TRP, SD, SFSCs, VI	AFN review, CON, CSA, FD-MLS, FD-SEC, FD-SEC, GEN, KN-NET, LOC, MRKT , NEO-LIB, ONL, ORG, PROD-CON, SCAL, SNA, SUS, SUS-AGR, TERA
Agroecology and Sustainable Food Systems	1	1	-	-	AUS,	RFLX	FM
American Journal of Agricultural Economics	1	-	-	-	USA	SFSCs	CSA, FM,
American Journal of Alternative Agriculture	1	-	-	-	USA,	SD	AFN review
Antipode	2	-	2	-	CAN, UK	ETH-PRAC, POL-EC	ALT, EXCLU
Area (RGS with IBG)	2	1	-	-	UK (2),	VIR-REC	GOV, LOC, NEO-LIB, PROD-CON,
British Food Journal	2	1	-	1	BRA, ITA	ETH-PRAC, SFSCs	CON
Cambridge Journal of Regions, Economy and Society	1	-	-	-	USA	SFSCs	JUST
Ecology and Society	1	-	1	-	CHN,	ST	TRANS, TRUS
Economic Geography	1	-	-	-	UK	ANT, CT, EMB	QLTY,
Environment and Planning A	3	-	1	-	DEU, NLD, UK	SFSCs,	AFN review, RUR-DEV
Environmental Politics	1	1	-	-	CAN	ASSEM, SNT	AFN review
European Urban and Regional Studies	2	-	-	1	UK, GRC	SFSCs,	ALT,MRKT,
Food Policy	1	1	-	-	UK	SD, SFSCs	FD-MLS, LOC-FD, SUS-AGR
Food Quality and Preference	3	2	-	-	DEU, ITA (2)	CT, SFSCs,	GEN, LOC-FD, ORG, QUAL, VAL
Futures	1	-	1	-	BEL	POL-EC	CON,
Geoforum	4	-	2	-	AUT, DEU, UK, USA,	E-EMB, FD-SEC, POL-EC, SFSCs, TERA,	GM, LOC-FD, ORG-STR,
Geographical Journal	1	-	1	-	ITA	ETH-PRAC, LLRs, TERA	RUR-DEV, SUS-AGR, TRUST
Geography Compass	1	-	-	-	AUS	E-EMB, S-EMB,	SUS-AGR
GeoJournal	1	-	1	-	FRA	SFSCs	GOV, CON, FT
Human Organisation	1	1	-	-	USA	SD, SFSCs	SUS-AGR

Appendix 1.

International Encyclopedia of Human Geography	1	-	-	-	USA	CT, EMB	AFN review
International Journal of Entrepreneurship and Small Bus…	1	-	1	-	ITA	TERA,	RUR-DEV
International Journal of Sociology of Agriculture and Food	6	-	1	-	AUS, AUT(2), CAN, NLD, UK(2)	POL-EC, RFLX, CivFNs	GEN, MRKT, PROD-CON, RACE
International Sociological Association	1	-	-	-	UK	S-EMB, SFSCs,	AFN Review, LOC-FD , ORG, QLTY
Journal of Agricultural and Environmental Ethics	2	-	1	-	ESP, USA	CT, FD-SOV,	AFN review, ALT, GOV
Journal of Agriculture, Food Systems, and Community Dev.	2	1	-	-	CAN, UK	TERA	AFN review
Journal of Consumer Culture	1	-	1	-	IRE	CIV-ENG, FD-SOV, RFLX	CON
Journal of Economic and Social Geography	1	-	-	-	UK	SD,TERA	MRKT,
Journal of Economic Geography	2	-	-	-	UK	EMB,	AFNs vs CFNs
Journal of Hunger & Environmental Nutrition	2	-	-	1	DEU, USA	VIR-REC	FM, SFSCs, SMEs
Journal of Planning Education and Research	1	-	-	-	USA	LOC-TRP,	SCAL
Journal of Rural Studies	27	5	5	5	CAN, DEU, DNK(2), FRA, IRE, LVA, UK(9), USA(10),	ANT, CT, EMB, HI, HYBR, LRRs, POL-EC, RFLX, S-EMB, TERA, VIR-REC, VI	CON, CSA, GOV, ONL, RACE, RUR-DEV, SCAL, SUS-AGR, URB-AGR,
Journal of Social Philosophy	1	-	-	-	USA	VI	FT, JUST
Journal of Southern African Studies	1	-	-	-	SA	FD-SEC	AFNs vs CFNs
Journal of Sustainable Agriculture	1	-	1	-	FIN	VI	LOC-COM, SNA
Land Use Policy	3	2	1	-	ESP,ITA,UK	E-EMB, S-EMB, TERA	PERI-U-F, RUR-DEV
Landscape Research	2	-	-	-	UK, USA	E-EMB,	TERA, SUS-AGR
NJAS - Wageningen Journal of Life Sciences	1	1	-	-	NLD	VI	AFNs, CON, VAL
Progress in Human Geography	1	-	-	-	UK	SFSCs	AFN review, QLTY,
Public Health Nutrition	1	-	-	-	AUS	POL-EC, SD	SUS
Rural Society	1	-	1	-	AUS	E-EMB	FM
Rural Sociology	1	1	-	-	USA	S-EMB, VI	FM, KN-NET
Sociologia Ruralis (Rural Society)	4	-	1	-	UK (4)	EMB, TERA	ALT, FM, QLTY, RUR-DEV, , PROD-CON
Spanish Journal of Rural Development	1	-	-	1	UK	POL-EC	RUR-DEV, URB-AGR
Sustainability	2	1	-	-	UK, USA	ETH-PRAC, SFSCs,	CON, LOC-FD, ORG,

Appendix 1.

The International Journal of Justice and Sustainability	3	1	1	-	AUS, ITA, UK	TERA, ETH-PRAC,	COM-EC, CSA, MOTAV
The Journal of Agricultural Education and Extension	1	1	-	-	UK	SD	KN-NET, SUS-AGR
Trends in Food Science & Technology	1	1	-	-	UK	SFSCs,	FD-MLS, LOC-FD, QLTY
TOTALS	132	26	26	9			

Theoretical Approaches	Abbreviation						
Actor Network Theory	ANT	Food Security	FD-SEC	Reflexivity	RFLX	Vertical Integration	VI
Assemblage	ASSEM	Food Sovereignty	FD-SOV	Short Food Supply Chains	SFSCs	Virtual Reconnection	VIR-REC
Civic Engagement	CIV-ENG	Gender Inequality	GEN-I	Social-Embeddedness	S-EMB		
Civic Food Networks	CivFNs	Horizontal Integration	HI	Social Theory	ST		
Convention Theory	CT	Hybridity	HYBR	Social Network Analysis	SNA		
Ecological-Embeddedness	E-EMB	Lagging Rural Regions	LLRs	Sustainable Development	SD		
Embeddedness	EMB	Local Trap	LOC-TRP	Territoriality	TERA		
Ethical Practice	ETH-PRAC	Political Economy	POL-EC	Urban Bias Theory	UBT		

Thematic Areas	Abbreviation								
Alternative vs Conventional	AFNs vs CFNs	Food Miles	FD-MLS	Local Food	LOC-FD	Organic	ORG	Sustainable Agriculture	SUS-AGR
Alterity	ALT	Genetically Modified	GM	Marketisation	MRKT	Quality	QLTY	Transformation	TRANS
Community Economy	COM-EC	Gender	GEN	Motivations	MOTAV	Race	RACE	Trust	TRUS
Community Supported Agriculture	CSA	Governance	GOV	Neo-Liberalism	NEO-LIB	Rural Development	RUR-DEV	Urban Agriculture	URB-AGR
Consumer	CON	Justice	JUST	Online	ONL	Scale	SCAL	Values	VAL
Exclusivity	EXCLU	Knowledge Networks	KN-NET	Organisational Structures	ORG-STR	SMEs	SMEs		
Fair Trade	FT	Local	LOC	Peri-urban farmland	PERI-U-F	Social Benefits	SOC-BEN		
Farmers Markets	FM	Local Communities	LOC-COM	Producer – Consumer	PROD-CON	Sustainability	SUS		

	Abbreviation						
Actor Network Theory	ANT	Food Security	FD-SEC	Reflexivity	RFLX	Vertical Integration	VI
Assemblage	ASSEM	Food Sovereignty	FD-SOV	Short Food Supply Chains	SFSCs	Virtual Reconnection	VIR-REC
Civic Engagement	CIV-ENG	Gender Inequality	GEN-I	Social-Embeddedness	S-EMB		
Civic Food Networks	CivFNs	Horizontal Integration	HI	Social Theory	ST		
Convention Theory	CT	Hybridity	HYBR	Social Network Analysis	SNA		

Appendix 2 Interview Discussion Guide example

- Could you tell me about the [RFS1] and what's your role within it?
- Could you identify any factors that have limited the development and implementation of the business work and its aspirations?
- Unintended consequences, either positive or negative?
    - Staff > career development, training
    - Philanthropy, community relationships, urban/ rural, online,
- Competitors?

Suppliers

- Who are your suppliers and what relationship do you have with them?
    - What supported this or hindered this?
    - Change over time?
    - Supplier/ buyer power – who's leading who?
    - Local?
    - How do they get their products to your shops?
    - Profit margins?

Marketing/ customers

- How do you market your company?
    - Any data on typical customers?
    - Spending habits, social background, gender, race, ethnicity, age? When is the busiest times for the sales
    - Who are your customers?
- Customer relationship with the food > local, ethical, transparency, meet the grower/ manufacturer,

AFN

- Where do you see yourself in the market compared to supermarkets?
- Can you describe the network that you have? Suppliers, farmers and growers, manufacturers, customers, community…
- Rural/ Urban?
- Do you use a social media platform? Can you describe which one and why you use this one?

Sustainable development

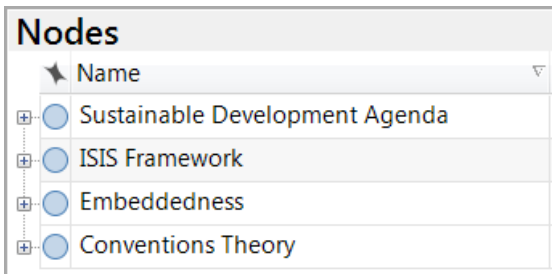
- What does sustainability mean to you?
- The company?
- Renewable energies, recycling, energy efficiency measures, fair wages, community outreaches, CSR, philanthropy, food miles, organic vs non-organic, animal welfare,
- If you wanted to put a sustainability initiative in your business how would you go about it?
- Drivers and barriers?

Decision making

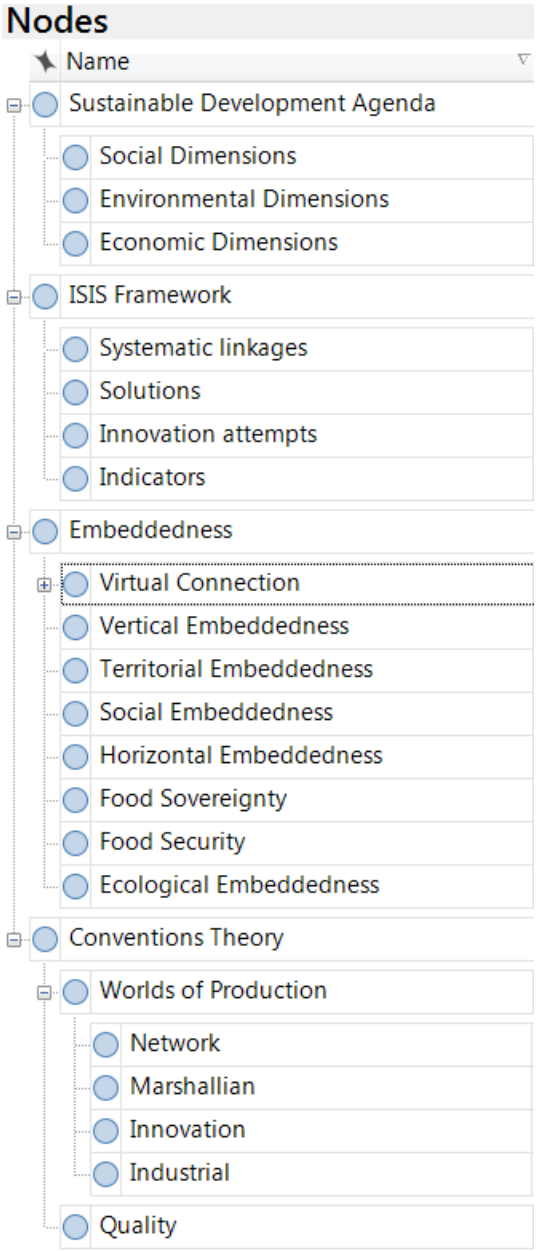
- What's the company's leadership and management structure?
- How are new decisions made?
- Any decision making tools to aid this process?
- Business plan? How long does this go on for?
- Family business important? How does this impact on how the company is ran?

Appendix 3 Template Analysis development

Initial Priori codes used in preliminary template. Two concepts from the literature from AFN and two main categories of Sustainability thinking. These were the initial overarching themes of the analysis.



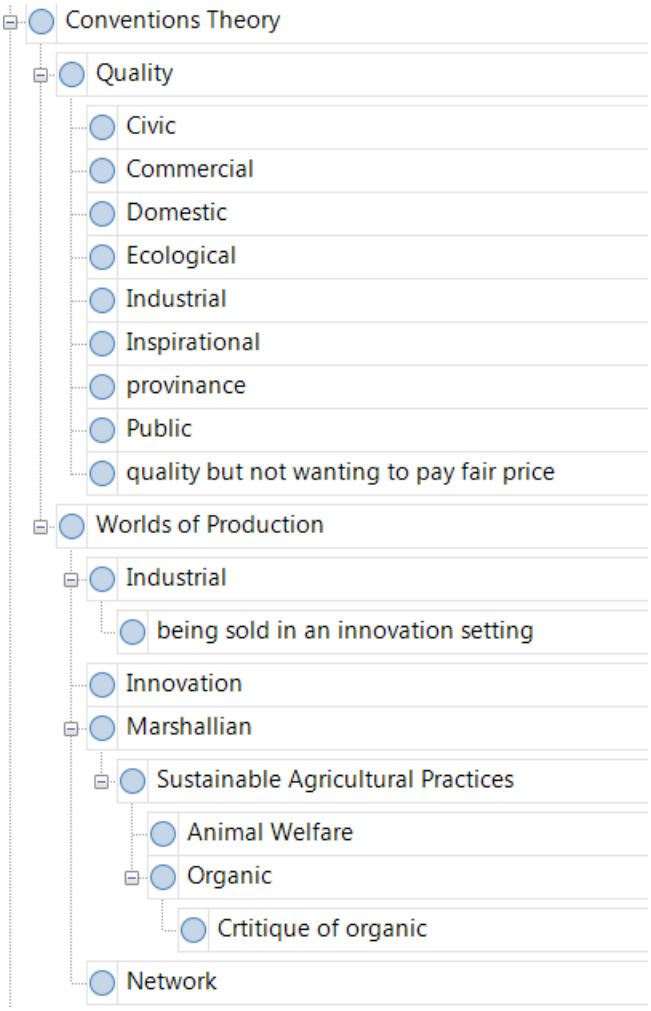
Sub-categories inserted upon reading first interview transcript (AF1).



Appendix 3.

After completing a full review of the interview transcripts, the overarching themes are shown in the print screen to the right. Note the addition of political issues, SFSCs, Supply Chain Management, and Customers and Consumers, CFNs vs AFNs.

Unlike thematic analysis and it's three layered coding system as highlighted by Braun and Clarke (2006), template analysis uses multiple and in-depth coding within a template. For example see coding for Convention theory as shown on the right.



University of Chester

Appendix 4 Invitation Letter

Dear Sir/Madam

Decision maker attitudes towards sustainable development in alternative food networks

You are being invited to take part in a research study by participating in an interview about your experiences and views regarding sustainable development in the food sector. I am interested in gathering your incites as you have a practical and everyday understanding of your sector which is an invaluable asset for an academic to have access to. Once your views have been analysed and then synthesised with the academic literature; the link between academia and practitioner can be established thereby making the results, conclusions and recommendations of this study more real to life and useful.

The purpose of this research is to explore decision-maker's perceptions regarding sustainable development in the food sector. I am therefore writing to ask if I could meet with you to explore your views on this topic as your comments will form an integral part of my research. The research will be used as primary data in order to support a doctoral thesis. The thesis itself will aim to generate a greater understanding of this context with you, the practitioner, at the centre of the research strategy.

Any information you share will be treated confidentially and anonymised if included in the thesis. With your permission the interview will be recorded to ensure that an accurate record of the interview is taken and to facilitate analysis.

Participation in the evaluation is by voluntary informed consent. If we have not heard from you within the next 7 days, I will be contacting you to arrange a date and time for me to meet with you. The interview should last no more than an hour and would be held at a mutually convenient place.

I look forward to meeting you.

Yours sincerely,

Henry Sidsaph

Appendix 5 participant information sheet

University of Chester

Participant Information Sheet

PhD research thesis research

You are being invited to take part in a research study by participating in an interview about your experiences and views of sustainable development in relation to the food sector. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Please ask me if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

Thank you for reading this.

What is the purpose of the research?

The purpose of this research is to explore business decision-maker's perceptions regarding sustainable development in the food sector. The research will be used as primary data in order to support a doctoral thesis. The thesis itself will aim to generate a greater understanding of this context with you, the practitioner, at the centre of the research strategy.

I am interested in decision maker views and experiences of how your company works, what your views and experiences are with sustainable development (commonly referred to as; sustainability), how this it supports your business/meeting the needs of your customers and how you interact with other companies within your network. The findings from the study may help to further develop the practical understanding and implementation of sustainable development in the food sector.

Why have I been chosen?

You have been chosen because you are a practitioner who is a decision-maker/ owner of a company who operates within an alternative food network (see definition below). You have a practical and everyday understanding of your sector which is an invaluable asset for an academic to have access to. Once your incites/ views have been analysed and then synthesised with the academic literature; the link between academia and practitioner can

established thereby making the results, conclusions and recommendations of this study more real to life and useful.

Alternative Food Networks are "*commonly defined by attributes such as the spatial proximity between farmers and consumers, the existence of retail venues such as farmers markets, community supported agriculture (CSA) and a commitment to sustainable food production and consumption" (Jarosz, 2008)*

Do I have to take part?

It is up to you whether or not you take part. If you decide to take part you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason.

What will happen to me if I take part?

If you decide to take part you should keep this information sheet. I will contact you with an initial e-mail, to arrange a time and place to conduct the interview – h.sidsaph@chester.ac.uk . The interviews will last between 30 minutes and an hour. You will be asked to sign a consent form and with your permission the interview will be recorded.

What are the possible disadvantages and risks of taking part?

There are no disadvantages or risks foreseen in taking part in the study.

What are the benefits to taking part?

You may welcome the opportunity to give your views on decision making in relation to sustainable development as you may have interesting incites which you wish to share. Findings from the research may also help to improve your business as it is my intention to create recommendations of best practice, along with a potential decision making tool that I aim to develop.

Will my taking part in this study be kept confidential?

Taking part in this study is anonymous and no names or details that could identify you would or your company would ever be used in any verbal or written report of the study. I intend to designate companies and participants alphanumerically, for example; company one would be: 1C, participant one would be: 1P and so on.

What will happen to the results of the research study?

A written report of the study will be produced as a doctoral thesis (also known as a dissertation), for submission to the University of Chester for award of PhD. I can send you a

PDF copy of the thesis when it is complete. As I already explained, nobody who takes part in the study will be identifiable.

Who is organising and funding the research?

I am a full-time PhD student at the University of Chester in the Business Research Institute. I am on a fully-funded studentship which is paid for by the University's funds as part of the Gladstone fellowship. The research will not be used commercially and will only submitted for academic purposes. If you wish to know more information please let me know.

What if something goes wrong?

If you wish to complain or have any concerns about any aspect of the way you have been approached or treated during the course of this study, please contact Professor Phil Harris, Executive Director, Business Research Institute, University of Chester, Riverside Campus, Castle Drive, Chester, CH11SL. p.harris@chester.ac.uk 01244 511867

Who may I contact for further information?

If you would like more information about the research before you decide whether or not you would be willing to take part, please contact me (Henry Sidsaph) on 01244 511818 or 07545668219 or write to me at the Business Research Institute, University of Chester, Riverside Campus (CRV110), Chester, CH1 1SL. You can also email me at h.sidsaph@chester.ac.uk

Thank you for your co-operation in this research.

Appendix 6 Consent Form

University of Chester

Interview

Consent form

Title of project: PhD Thesis interview: Sustainable Development in Alternative Food Networks

Name of Researcher: Henry Sidsaph

Please initial box

1. I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason. ☐
3. I understand that the interview will be audio-recorded. ☐
4. I understand that my name and personal details will not appear in any report. ☐
5. I agree to take part in the above study. ☐

_____	_____	_____	☐
Name of Interviewee	Date	Signature	
_____	_____	_____	
Researcher	Date	Signature	

Appendix 7. Interview Transcripts

Due to the regulations of this University limiting the word limit of doctoral thesis to a maximum of 100,000 words, the transcripts were removed from this appendix in order to comply. They can be accessed via the following Dropbox link:

https://www.dropbox.com/s/zkakq9ukb2uqvai/Appendix%207.pdf?dl=0

Appendix 8 Twitter connections dataset

This appendix shows a sample of the twitter connections from an excel spreadsheet. When copying the entire dataset into this document the text was too small to be intelligible and as a result a sample was selected. The purpose of this appendix is to aid in the understanding of how the data was presented in the spreadsheet in a binary format. The full data set can be found via this Dropbox link: https://www.dropbox.com/s/f5oh51eoeipqkfj/appendix%208.xlsx?dl=0

Codes	R:FS1	R:FS2	R:FS3	R:FS4	R:FS5	R:FS6	R:FS7	R:FS8	R:FS9	R:FS10	R:FS11	R:FS12	R:FS13	PB1	PB2	PB3	PB4	PB5	PB6	PB7	PB8	PB9	PB10	PB11	PB12	PB13	PB14
FDC1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	1	0	0
FDC2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0
FDC3	1	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
FDC4	1	1	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0
FDC5	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	0	0	1	0	0	1	0	0	1	0
FDC6	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0
FDC7	1	1	0	0	0	1	1	1	0	0	0	0	1	0	1	0	1	1	0	0	0	0	0	0	1	1	0
FDC8	1	1	0	1	0	1	1	0	0	1	1	1	1	1	0	0	1	0	1	0	1	1	0	0	1	1	0
FDC9	1	1	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
FDC10	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	1	1	0
FDC11	1	1	1	1	0	1	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
FDC12	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FDC13	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
FDC14	1	0	1	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	1	0	1	1	1	0	1	1	1
FDC15	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
FDC16	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
FDC17	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FDC18	1	0	1	1	1	1	1	1	0	1	0	0	1	1	0	0	0	0	1	0	1	1	0	1	0	1	1
FDC19	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FDC20	1	0	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FDC21	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FDC22	0	0	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
FDC23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FDC24	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
FDC25	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	0	1	1	0	0	1	1	0	0	1	0	0
FDC26	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
FDC27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FDC28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FDC29	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
FDC30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FDC31	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0