THE ROLE OF SOCIAL ENTERPRISES IN REDUCING UK SUPERMARKET FOOD WASTE: A NETWORK PERSPECTIVE

by

SAMANTHA ANNE SANDILANDS

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Birmingham Business School

College of Social Sciences

University of Birmingham

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ABSTRACT

This research aims to investigate the networks involved in food waste reduction in three major UK supermarkets, with a focus on the use of social enterprise within the networks. Granovetter’s (1973) strength of weak ties theory is used as a lens through which to analyse the network, taking his assertions around the four factors involved in strong ties - time, emotional intensity, mutual confiding and reciprocity - to better understand the ties involved in the network.

A qualitative case study approach is used for this research, taking each of the three supermarkets as individual cases. Each case contains a series of primary semi-structured interviews and secondary data to triangulate the findings, which are presented using network maps, tables and discursive thematic analysis for each case. The cases are then analysed using a cross-case analysis.

The key findings from this research from a theoretical perspective, are that the four factors described in Granovetter’s theory may be true of some network relationships, but are certainly not required in all strong ties. Granovetter also asserts that networks with more weak ties are often more effective as they contain more nodes and bridging ties and thus can have a wider reach. However, in some cases where there is a physical exchange of products between organisations, networks with strong ties were found in this research to be more effective in facilitating this. Therefore, the networks have been shown to be far more nuanced than Granovetter’s theory allows

for, particularly for networks which are not just information-based but where there is a physical product involved.

In practice, this research not only tests the four factors proposed by Granovetter, but seeks to identify further developments which act as facilitating factors and barriers to effectiveness within the network. A series of factors were identified which demonstrate some consistency across the three cases in this research. This has helped to inform a series of policy recommendations for food waste in the UK. Where voluntary agreements have facilitated some progress against the UN Sustainable Development Goal 12.3, to reduce food waste by 50% by 2030, the relatively hands-off approach taken by DEFRA and the UK government means that progress is currently varied. Recommending a greater level of involvement, similarly to countries such as France, Italy and some US states, could accelerate progress and improve consistency between the supermarkets' advancement toward food waste reduction.

In summary, this research contributes to literature in the areas of social enterprise, food waste and network theory, and provides some evidence-based recommendations for policy and practice in food waste reduction in UK supermarkets.

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1.0 INTRODUCTION

Food waste is a topical issue with clear impact across economic, social, and environmental factors. Thyberg and Tonjes (2016) describe food waste as a "complex, interdisciplinary and international issue which can have profound effects for global sustainability". A current global issue, it is reported that 1.3 billion tonnes of food is wasted every year (FAO, 2018; UN, 2022). This equates to one-third of all food produced. Economic losses are made across all stages of the supply chain. Examples include: farmers who cannot sell all of their produce as it does not meet the aesthetic requirements of retailers, leading to overproduction in order to satisfy contractual commitments; distributors without adequate measures for protecting their product, leading to damaged goods that cannot be sold; retailers who over-order their stock to meet the customers' expectations of constantly fully-stocked shelves; and consumers who purchase more food than they will eat, sometimes due to multi-buy offers or perhaps ending up discarding it for other reasons post-purchase, such as short best-before dates or lack of awareness of alternative options for its use. Simultaneously, from a social perspective, one in nine people globally are classed as undernourished. Redistribution of edible food could potentially address this social imbalance, reducing the number of people living in food poverty (Diaz-Ruiz et al., 2019, Karki et al., 2021). Environmentally, food waste creates a high level of greenhouse gas emissions, higher than that of air travel, which is often cited as producing levels of emissions with vastly negative environmental impacts. There is a worldwide focus on addressing food waste, with a clear commitment from many governments who seek to reduce it (Vittuari et al, 2015). These targets are mostly in line with the United Nations' target of 50% reduction in food waste by 2030 (UN, 2015), as part of the Sustainable Development Goals. This focus makes it an important topic to study at the present time, with more initiatives introduced regularly, all over the world.

Food waste management differs between countries, and sometimes even within countries, and there are a number of different approaches used, from a policy and regulatory perspective, to address the issue (Vittuari et al, 2015). These can include food waste bans, voluntary agreements between organisations and governments which commit the organisations to working towards a set target, tax incentives or campaigns without any official regulatory policies. Alongside any implementation or changes to policy and regulations, infrastructure considerations that help to support the changes are important in order to facilitate its successful implementation. This ensures ease of access to those affected by the new or updated policy, and an introductory phase can be used to help with managing the transition.

Such infrastructure can include the use of social enterprises, which has been demonstrated in the United Kingdom's (UK) supermarket sector, where voluntary agreements are used to aid in food waste reduction. Studying the influence of policy and social enterprises on the wider supermarket food waste network, and the nature of social enterprises working within the UK context will provide a useful insight into the effects that network relationships can have on the effectiveness of social enterprises as a solution to decreasing food waste. Social enterprise is a growing phenomenon (Salamon et al., 2004) that combines economic and social aims to create an organisation with a focus on both (Defourny and Borzaga, 2001). In other words, social enterprises exist to address a social issue, which remains at the core of their purpose, and in order to achieve the goal, they trade products or services that help them, or others, to work towards addressing the social issue.

Social enterprises sit within a wider network of organisations and stakeholders in their pursuit of tackling a social issue. Food waste affects the supply chain as a whole and the network involves a range of key players throughout. This includes governments, charities, non-government organisations (NGOs), network groups and waste management organisations who all seek to help to reduce or process food waste throughout the supply chain (Visser-Amundson, 2022). There are also stakeholder organisations that generate surplus food. These include farmers, manufacturers, suppliers, retailers, and consumers, who each occupy different stages of the supply chain, and each has an economic incentive to reduce waste, in addition to any social or environmental motives.

The nature of this expansive network, and the connections which potentially exist throughout, lends itself well to the use of network theory as a lens for examining this research topic. The networks and relationships between stakeholders will be considered in-depth, and drawn upon to assist in the understanding of existing research. Network theory, specifically Granovetter's Strength of Weak Ties theory will be used as a lens through which to study the relationship between supermarkets and social enterprises in the context of food waste, allowing for an analysis of the network ties and how they operate in order to maximise food waste reduction. The research will take the four factors in strong relationships identified by Granovetter, assess the network ties using these four factors and aim to make a contribution to the theory based on the findings.

In the context of the above, this research aims to consider how social enterprises work within supermarket networks, using strong and weak network 'ties' to address their food waste. Using the UK as an example, this research will help to identify the impact of these relationships on food waste supply chains, and whether the impact that social enterprises can have on the wider network is affected. The overarching research question which will be the focus of this study is:

> *"How do UK-based supermarkets utilise their network ties with social enterprises and government contacts to effectively reduce their food waste within the supply chain?"*

This question will be investigated using a series of six subsidiary questions as identified through the review of the literature. This will enable a broader and deeper understanding of existing knowledge and will allow for a study which contributes to the current body of research, and are included as follows.

1. Are UK supermarkets' food surplus networks comprised of **both strong and weak ties** with social enterprises, governments and other supporting organisations?
2. How do the strong and weak ties within the network effectively enable social enterprises to assist in managing supermarket food surplus, and how does this align with the **food waste hierarchy**?

3. Do **social enterprises** form a key component of UK supermarkets' food surplus networks?
4. Are there any key **facilitating factors** to support the effectiveness of managing food surplus, and do they differ between strong and weak ties?
5. Are there any **barriers** to the effectiveness of managing food surplus, and do they differ between strong and weak ties?
6. What are the key **motivations** of food waste reduction stakeholders to partake in the network?

In the following review of the literature, the research context of food waste will be considered, including the global impact, UK policy, UK and worldwide statistics, and food waste in the UK supermarket sector. Statistics and frameworks will be examined to outline the extent of the issue, why it is important and where there is potential for impact to be made in the reduction of waste. UK and global contexts will be included in this review in order to illustrate the wider impact of this economic, social and environmental issue. Due to the current nature of food waste as an issue, and the rise of social enterprise activity, social enterprise has been chosen as a specific focus for the research as it offers a timely insight into an approach which can be used to address social and environmental issues, with economic underpinnings. Taking both food waste and social enterprise into account, network theory will be justified as an appropriate theoretical lens by looking more widely at food waste networks and the relationships within them that enable social enterprises to operate effectively.
Network theory will be used to interpret the literature, tie social enterprise and food

waste together and frame the research appropriately, leading to the development of a set of research questions to be answered during the course of this thesis.

2.0 LITERATURE REVIEW

2.1 Food Waste

Food waste is a multi-faceted, global issue which presents economic, social and environmental concerns. Waste occurs across all parts of the supply chain, which means unsold food and opportunities for redistribution or recovery throughout the supply chain. If it were a country, food waste is said to be the third highest greenhouse gas emitter after China and the USA (FAO, 2015; Agriland, 2021), which signifies its huge environmental impact. For consumers, where the highest amount of waste occurs, the economic impact is in food which is purchased but never eaten. Socially, with global poverty standing at around 8% in 2018 according to the United Nations (UN, 2020), and 33% of food grown ending up wasted (FAO, 2011; WRAP, 2023), this imbalance contains great social potential.

This section will start by defining what is referred to as food waste, followed by an overview of the global and UK national contexts. The issue of food waste will be reflected upon in the context of the UN Sustainable Development Goals. This will be included as these goals contain a global goal which the UN has agreed to as a target for the reduction of food waste, Goal 12.3, which aims to reduce food waste by 50% by 2030 (UN, 2015). It will then proceed by looking more in-depth at some of the key statistics on food waste, including that of UK supermarkets, in order to provide a greater contextual understanding of the issue. It will consider a number of angles including global data and national data for the UK, supply chain data and an assessment of different models used in addressing the issue of surplus food. By the end of the chapter, the justification for researching food waste should be clearly communicated, demonstrating both the wider context and that of the UK which will be studied as part of this research.

2.1.1 Defining food waste

In the first instance, defining what is classed as food waste is helpful in providing understanding for the purpose of this research. The waste hierarchy is a common and consistent way of defining waste generally, which has been further adapted specifically for food waste. The hierarchy is presented as an upended triangle, which represents the ideal proportions of how (what would otherwise be) waste should be diverted. The model is intended as a flexible framework (DEFRA, 2011).

Organisations which produce or help to manage waste can often place their waste strategies into a certain level of the hierarchy, but this should not mean that they cannot change it. The model is intended to allow an organisation to make its assessments based on current practices and then plan for how it can move some or all of its waste further up the hierarchy. The European Parliament has adopted a broad overarching version of this widely accepted hierarchy for waste since the 1970s (European Parliament, 2008), as in Figure 2A below.

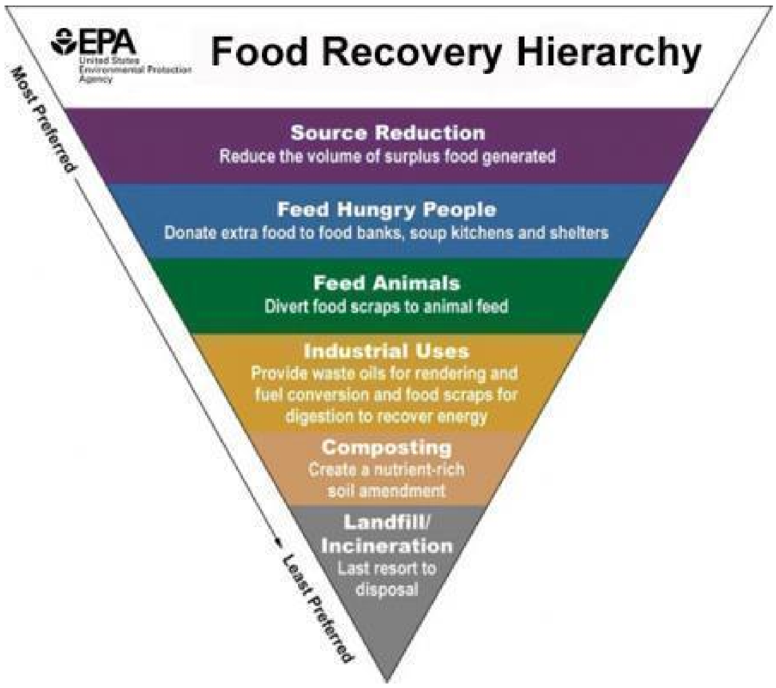
Figure 2A: Adaptation of hierarchy from the European Commission's Community Strategy for Waste Management (DEFRA, 2011).

The well-known recycling symbol of three arrows in a circle (Figure 2B) is rooted within this hierarchy, often accompanied by the phrase 'reduce, reuse, recycle' which encompasses the top three sections of the model (Gertsakis and Lewis, 2003). This demonstrates the consistency in approaches which is helpful in delivering a memorable and coherent message to the target audience. In the case of the hierarchy, the 'other recovery' section which is below 'recycling' could encompass methods such as energy production from waste products, which precedes disposal options at incineration or landfill.

Figure 2B: Global symbol for recycling (ClearIt Waste, 2022).

This hierarchy model has been specifically adapted for many different waste streams, including food waste. The USA's Environmental Protection Agency (EPA) produced a hierarchy model (US EPA, 2019) which is entirely focused on food waste. The levels in the hierarchy map clearly onto those in the more general European Commission hierarchy (Figure 2A) that demonstrates a general acceptance of the order of priority in terms of destinations of waste materials. Figure 2C below shows the stages of food waste prevention according to the USA's model.

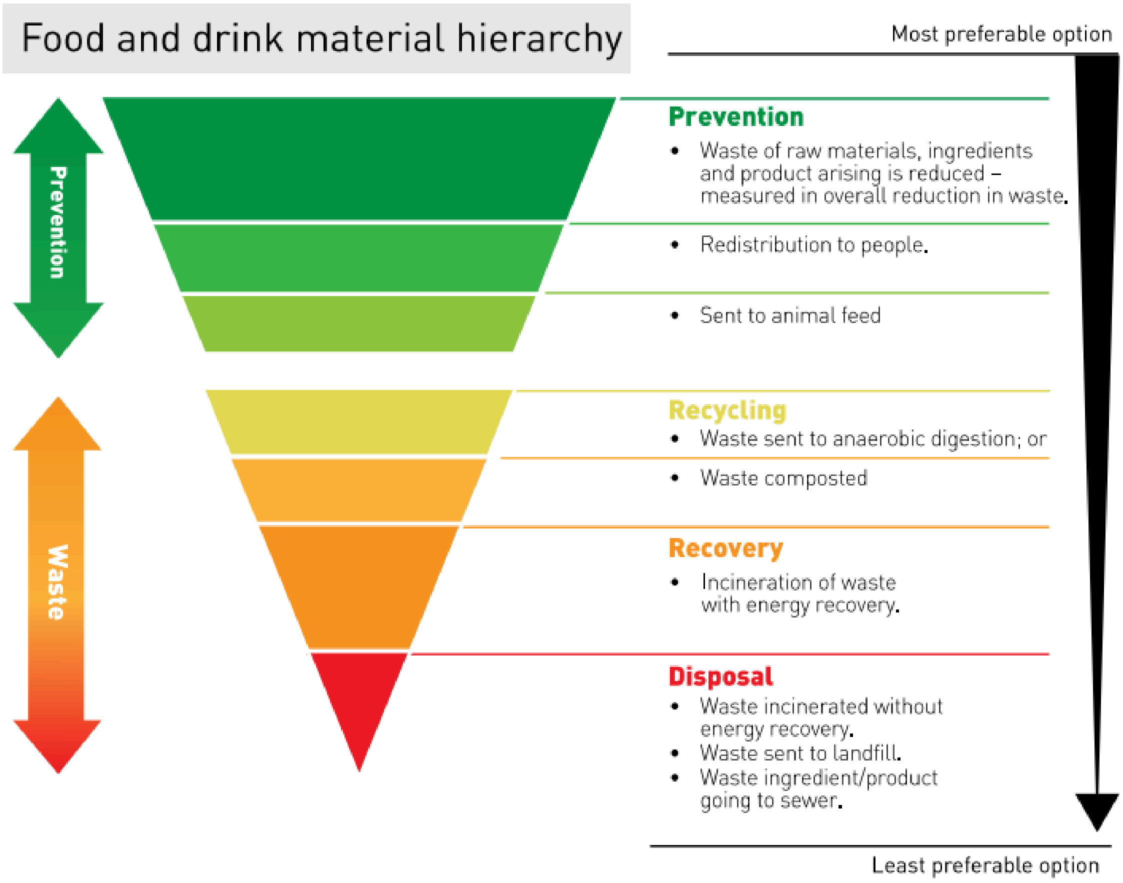
Figure 2C: EPA Food Recovery Hierarchy (US EPA, 2019).



It can be seen from this model that a 'most preferred' and 'least preferred' continuum is identified. In a similar way to the earlier model, prevention comes at the top of the triangle, followed by potential reuse options such as feeding other people or animals. It could be suggested that recycling options are limited in this model. An example of food recycling could be the use of discarded bread crusts to create an ale. As it stands there is no clear category for initiatives such as this.

The UK's version of the food waste hierarchy (Figure 2D) was developed by the Waste and Resources Action Programme (WRAP) and again uses the same order and the same types of information which demonstrates further support for the same overall goals, with some more detailed inclusions.

Figure 2D: WRAP Food and drink material hierarchy (DEFRA, 2011).

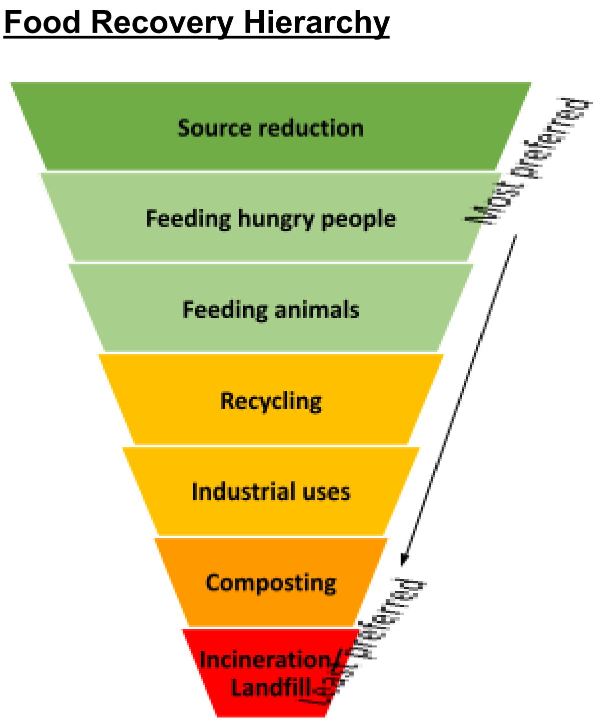


This model includes recycling as an explicit level, but uses anaerobic digestion and composting as examples of recycling. This still does not indicate a clear category for the example initiative of the bread crusts mentioned previously, which is a consideration for future versions of the model.

One major difference between the US EPA (2019) model and the UK WRAP (DEFRA, 2011) model is the indication of what is directly considered to be waste. Where the US model simply highlights a ‘most preferred’ and ‘least preferred’ continuum, the UK one is clear to state that anything from the ‘recycling’ level down to ‘disposal’ is considered waste even if recycled in an anaerobic digester, or composted. Whilst the food is not being used for its intended purpose if it is being used in an anaerobic digester or composted, there is still some value created from its existence, which is what makes food waste a difficult term to comprehensively define.

For the purposes of this research, a combination of the models will be adopted, based on the USA model, with the inclusion of a recycling segment, as follows in Figure 2E. The inclusion of this as a separate level ensures that activity can be classified appropriately. Taking, as an example, Bio-bean, a UK-based social enterprise who recycles used coffee grounds into a variety of sustainable products, including logs for wood burners (Bio-bean, 2020). This company, in addition to the previous example of the discarded bread which is recycled into ale (Toast Ale, 2020), could not be classified at any other level of the hierarchy as it is creating a whole new product from the food material. Waste will be considered as food which is going to incineration (without energy recovery by-product) or landfill, as per the lowest level of the hierarchy. Levels of the hierarchy will be referred to throughout this chapter as a reference point.

Figure 2E: Adaptation of EPA Hierarchy (US EPA, 2019) for use in this research.



Colouring is adopted as per the existing models and how they rank each type of food distribution, from source reduction as the most preferable method down to composting which is still making use of the food but is the least preferable option. The order of the levels is entirely consistent with the previous models for consistency, and when each is considered individually follows a pattern of priority which starts with economic savings, followed by social priorities. The environmental impact of food waste, however, is significant, with 4.4 gigatons of carbon emissions per year attributed to the breakdown of wasted food. To add context to this, road transport emissions produce five gigatons of carbon, which is a comparable amount. Hall et al. (2009) compared the increase in average body weight and calorie consumption with per capita food waste in the United States of America (USA), and found that there is a significant environmental impact of such increases both in terms of freshwater use and fossil fuel energy emissions. There are environmental benefits to food waste reduction, which could be assigned to any and all of the levels, as demonstrated visually in Figure 2F below. It shows that the environmental benefits are most effective at the top of the hierarchy and reduce throughout the stages. This is evidenced in Table 2A which is then followed by Figure 2F.

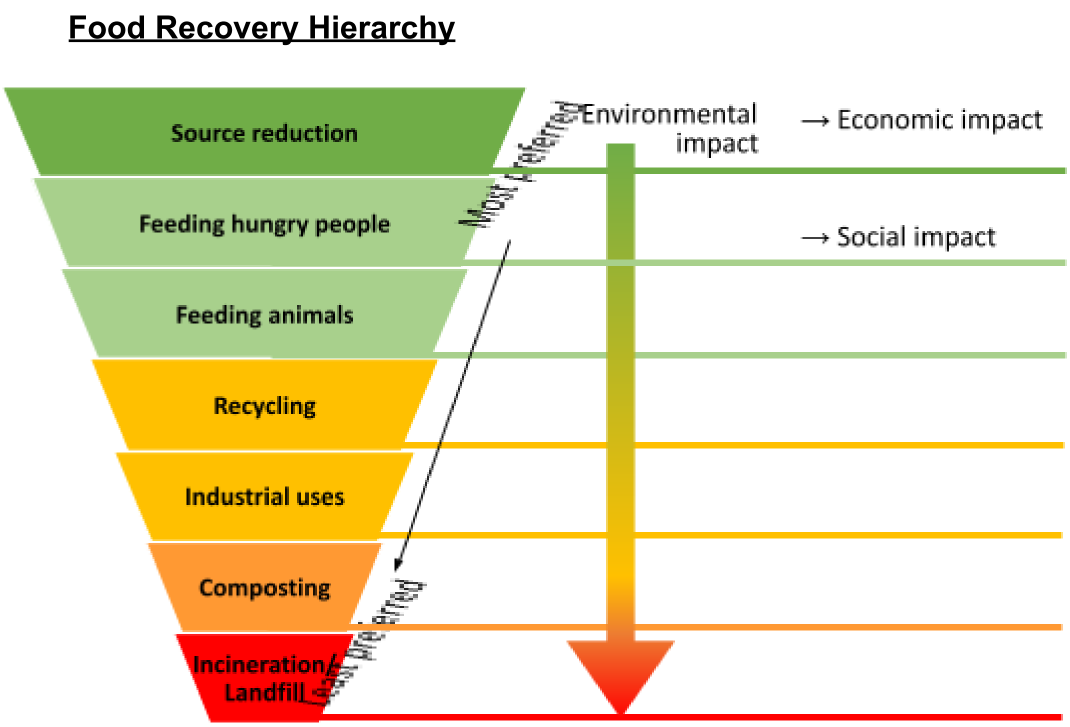
Table 2A: Environmental impact at each stage of the food waste hierarchy.

Stage of the hierarchy	**Environmental impact**
Source reduction	Reduction of food waste at the source creates a positive environmental impact at each previous and subsequent stage of the supply chain. For example, if a restaurant reduces its levels of waste at the source by reducing the amount of food being ordered or reducing the variety of food ordered, the supplier does not need to stock as much of a product, which then enables reduces throughout the rest of the supply chain and means that a farmer (for instance) can redirect their stock elsewhere which has a positive economic impact on them. Environmentally, a lower amount of food works its way through the chain which reduces the environmental impact of distribution methods involving transportation, reduces the amount of food that is sent to landfill by the restaurant and allows the producer to direct the stock elsewhere, thereby more likely moving their food products up the hierarchy as they are more likely to go straight to feeding other people rather than working its way through the supply chain which could then mean if uneaten it ends up being composted or sent to landfill. A second example is of a supermarket that offers buy-one-get-one-free offers on a product, which then leads a consumer to purchase two of the product, when perhaps they only wanted one, which then means that the extra one potentially ends up in landfill. Had the supermarket offered a

	price reduction promotion as opposed to a multi-buy promotion, the product could have been redistributed elsewhere, either to another person or an alternative in the hierarchy which would likely not be landfill.
Feeding hungry people	Using food for its original purpose, to feed people, is the first ideal level of food redistribution where reduction is not possible. This can be done in a number of ways, such as through food banks, apps, charities or other organisations who can aid in the redistribution of surplus food. Consumer-facing organisations such as supermarkets and restaurants could also offer discounts on any food which is nearing its expiry date which also keeps it within this section of the hierarchy. The environmental impact of directing surplus food to hungry people diverts the food away from landfill and ensures that the product is used for its original purpose. There is also a significant positive social impact involved in directing it to those who are in need or perhaps living in poverty by utilising relevant organisations who can ensure it reaches those people.
Feeding animals	Moving down to the next stage of the hierarchy, using surplus food for animal feed involves processing the food to ensure it is in a suitable form to then feed to animals. This processing, including transportation to an organisation which can deliver this process, has a negative environmental impact. However, the output of the food then delivers a positive environmental impact as animals are fed using products which may otherwise have ended up in landfill.
Recycling	Recycling comes in many different forms, all of which involve a level of processing. In some cases, the resulting outputs are environmentally positive, and others may be more neutral, but recycling of a product which would otherwise be sent to landfill still maintains a comparative net positive position.
Industrial uses	Industrial uses include activities such as anaerobic digestion and incineration with an energy-producing by-product. Whilst this method is the first in the hierarchy to move away from using food for its key purpose, it still makes use of the energy within the food. This method has a much higher negative

	environmental impact in order to process it into energy, there is still a positive output in the form of renewable energy.
Composting	The final stage before incineration or landfill is composting, which involves breaking down the food into a compost which can then be used to grow further food. This method does have a positive environmental impact, but some gases which affect air quality are released during the composting process which makes it less desirable than the other methods higher up the hierarchy.
Incineration/ Landfill	The environmental impact of food waste in landfill or incinerated is significant, accounting for one-third of all human-caused greenhouse gas emissions, or 8% overall (Earth.org, 2022). In context, global road passenger traffic contributed a similar 9.5% of greenhouse gas emissions, and 15% by road traffic overall when freight is also included (Our World in Data, 2018).

Figure 2F: Adaptation of EPA Hierarchy (US EPA, 2019) illustrating economic, social and environmental impacts.



As a result of this review of hierarchies, establishing an understanding of whether organisations prioritise their food waste in this order will help to illustrate where different organisations such as social enterprises fit within the network and how they are prioritised. From this review, it is proposed that supermarkets would indeed follow the hierarchy as shown in proposition 6 below.

PROPOSITION 6: Food surplus will be distributed by organisations following the food waste hierarchy.

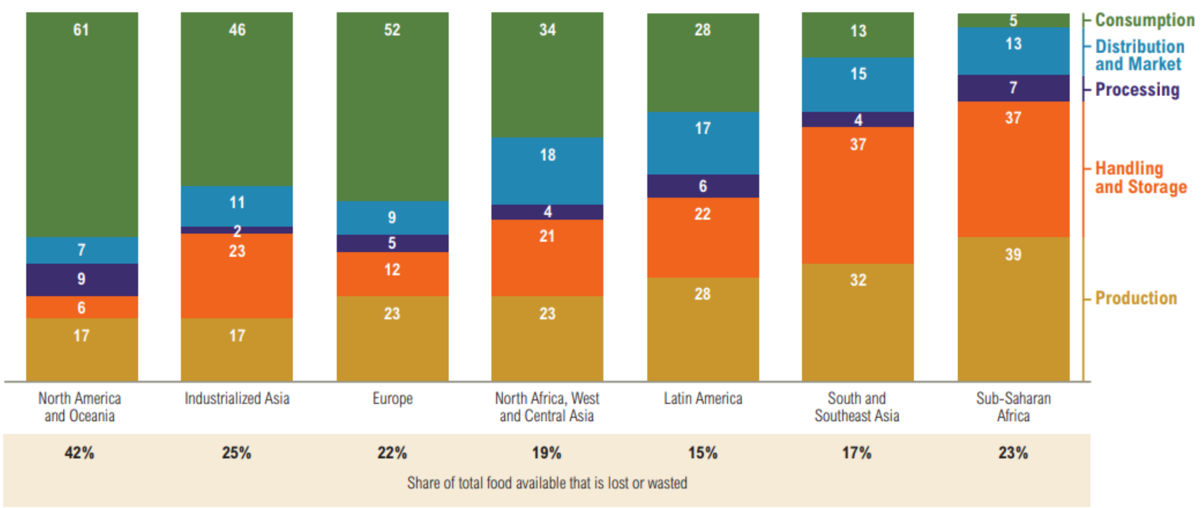
MEASUREMENT: Development and analysis of the network map and further assessment during the interviews, including the order in which actions are prioritised through the different levels of the hierarchy.

2.1.2 Global food waste statistics

Globally, the nature of food waste varies depending on a number of factors. Although, as has been seen, one-third of all food produced is wasted, this number can be explored in much more detail to understand the intricacies of that figure. The data on food waste could be analysed geographically, dividing the data up by continent to look for any key differences. This could provide an indication of any climate-related differences, infrastructural differences or cultural differences which could then be looked into further. Alternatively, the supply chain could be considered, and where along the food production process the greatest losses are situated. This could reveal useful information relating to where in the supply chain the research could be focused, and where there are issues to be investigated or successes to be identified. This could help with recommendations of practices for other parts of the supply chain or other geographical regions, where relevant, or it could provide insights into where improvements could be made.

Figure 2G shows the relationships between geographical regions and food waste along different points in the supply chain. This allows for comparisons not only between regions but simultaneously between segments in the supply chain. It also shows the overall percentage of available food which is lost or wasted in each region. Figure 2G shows the quantities involved, separated by region. These numbers were highlighted as part of a report from the Champions 12.3 project which focuses on the UN's Sustainable Development Goal 12.3, and the business case for the reduction of food waste. An analysis of Figure 2G follows.

Figure 2G: Percentages of waste by region in 2009, separated into stages of the supply chain. From FAO (2011) data and adapted in Hanson and Mitchell (2017).



The report by Hanson and Mitchell (2017), from which Figure 2G is taken, demonstrated that the main source of food waste varies between developed and developing countries. A glance at these continental averages demonstrates some interesting insights, particularly on the subject of where along the supply chain the waste comes from. It was found that in developed regions, food waste occurs more frequently at the consumption end of the supply chain, whereas in developing regions, the frequency is more weighted towards the production end. This could be attributed to a number of reasons. Firstly, at the production stage, the lack of available manpower combined with a reduced use of machinery to help harvest the produce and a much warmer climate may lead to greater losses early on for developing countries, for example, those in Sub-Saharan Africa and South and Southeast Asia. Similarly, in handling and storage, the most suitable way to store the harvested food may not be commonly available, for example, cool facilities to keep the food fresh. On the opposite side of the spectrum, in North America and Oceania, containing more developed countries, a much smaller overall percentage of the food is lost at these earlier stages, instead showing a large percentage of waste at the consumption end of the supply chain. Such issues with harvesting and storage appear much more minimal compared with the developing countries.

Whilst 33% of food is wasted worldwide, for North America and Oceania, this figure rises to 42% as demonstrated by Figure 2G, and is the only region which is above the worldwide average (Hanson and Mitchell, 2017). Latin America, at a level of 15%, wastes the lowest proportion of their available food. Interestingly, Latin America is the only continent with largely mirrored percentages at the production and consumption ends of the supply chain, and it also generates the lowest proportion of waste of all of the continents. This could be of interest to research further, as with lower levels of waste and a mirrored supply chain, it presents a unique case.

It is interesting to note from this visual representation that the ‘distribution and market’ level of the supply chain is one of the most consistent, ranging from 7% in North America and Oceania up to 18% in North Africa, West and Central Asia. When also combined with the ‘processing' stage, these regions change to Industrialised Asia with the lowest amount at 13% and Latin America with the highest at 23%. There is no other particular section of the supply chain displayed here which is as consistent as this with only a 10% range, which potentially demonstrates that similar issues are faced at these stages across all regions of the world. The ‘consumption’ level demonstrates the widest range of percentages, with just 5% of food waste coming from consumers in Sub-Saharan Africa, and 61% from consumers in North America and Oceania, a significant 57% difference. These figures show a potential difference in attitude towards, or perhaps availability of food on the consumer level across different world regions as there is such a large disparity between all of the numbers, with a minimum of 6% difference between any two regions.

On the subject of attitudes towards food, with the assistance of these numbers, it is clear that there is not going to be an effective blanket approach to dealing with food waste, which works globally. One approach which can be applied with alterations across continents and for challenges at different supply chain levels is the use of education. Education is an important factor in reducing food waste and many countries focus on this aspect when considering their approach to addressing food waste as a whole. From a European perspective, Aschemann-Witzel et al. (2015) found that consumers who act the most fervently to reduce their food waste cite their key motivation as ethical reasons such as societal equality and personal values rather than focusing on saving money. However, another factor was awareness and capability to understand what to do with food past its best-before date and learning how to use food safely in different ways. In order to reduce consumer food waste, the researchers suggest that retailers can help by using their influence along the whole supply chain to present food in different conditions. This helps to educate customers on how edible food can look at different points. They also suggest that retailer actions around packaging and pricing strategies can help to reduce waste overall. However, they also emphasise the importance of combining these measures with management of consumer behaviour and understanding of food.

There is evidence to suggest that the use of packaging plays a role in food waste, both positively and negatively. Gustavsson and Stage (2011) conducted research around fruit and vegetables at the retail level and found varying results on the sale of packaged or non-packaged produce and the volume of waste produced. In some cases, more food waste was produced when the food was packaged and, in some cases, it was the opposite, demonstrating that packaging actually does not reduce food waste at the retail level, but in fact only at other levels such as with consumers. Williams et al. (2012) identified three main packaging-related factors which increased food waste levels in households. These have to do with the size of the packaging, the level of difficulty in emptying the packaging and the influence of the ‘best-before’ dates printed on the packaging. Half of the participants participated in an educational programme prior to participation in the ethnographic study, and these participants were much less inclined to waste food, particularly due to ‘best-before’ dates. This demonstrates the importance of education around the issue, which, when implemented alongside any legislation, could help in the absence of the ability to provide holistic enforcement.

2.1.3 UN Sustainable Development Goals and Goal 12.3 – reducing food waste

The 17 Sustainable Development Goals set by the United Nations (UN) are framed as global sustainability targets to be addressed by 2030, as a progression of the Millennium Development Goals prior to this. Set in 2015, they are used in the allocation of resources and funding for the UN and are used in the setting of policy for the United Nations Development Programme (UNDP) (UN, 2015). These goals should be considered in the context of this research, as they set out a clear strategy for global sustainability, including food waste.

Goal 12.3 is specifically focused on food waste targets, and reads as follows:

> *"By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses" (UN,2022).*

This is an ambitious goal which would dramatically change the food waste landscape, yet is one that the United Nations countries have agreed upon. The UN is utilising a network-based approach to meeting the SDGs, at national, regional, and thematic levels. The Sustainable Development Solutions Network (SDSN) has been in operation since 2013, supporting "innovative solutions and partnerships" to accelerate progress towards the SDGs (UN, 2022). A consortium of key stakeholders has joined together to work towards the goal collaboratively, from businesses and governments to researchers and farming organisations, and collectively call themselves ‘Champions 12.3’ (Hanson and Mitchell, 2017). They hold four key goals, which are to dedicate themselves to contributing and encouraging others to contribute towards achieving Goal 12.3, to lead by example in this area by producing resources and statistics that assist with organisational strategies, to showcase and celebrate progress and successes, and to advocate through influential relationships on the subject of food waste reduction. To this end, a series of documents have been published since the group’s formation in September 2015, which contain a range of resources including a business case for food waste reduction, a roadmap for achieving the goal and a number of progress reports to date.

The most recent update, the 2022 Progress Report specific to goal 12.3 reports that despite being halfway through the SDG timeline, global food waste reduction is still not where it needs to be in order to meet the goal by 2030. They differentiate between government and companies in terms of progress and have goal-based timelines in the areas of targets, measurement and action (UN, 2022). The progress report signals that companies have made significant progress in the areas of measurement and action, where governments are behind on all three areas of required progress. This is based on set goals and tasks which have been set by the UN, and thus far have not been met against the 2019-2021 benchmarks. These include setting country-based targets, quantifying and reporting food waste statistics and working ‘at scale’ to reduce food waste. The UK is working towards these goals, having already set its own country-based target, the Courtauld Commitment which is further discussed in section 2.1.4 below, and launched a public consultation on working towards better reporting for organisations, meaning they would be able to gather the country-level data themselves (DEFRA, 2022). It has been reported recently, however, that there are currently no plans in place to implement any further policies as a result of the consultation, including mandatory reporting or mandatory targets for 2030 (The Grocer, 2023).

2.1.4 Food waste in the United Kingdom

The United Kingdom (UK) takes the approach of creating voluntary agreements with organisations to reduce food waste. The Courtauld Commitment 2025 is the UK's partnership model which aims to reduce food waste by 20% between 2015 and 2025. As of 2018, 156 businesses had signed a voluntary agreement under this commitment, setting themselves a 20% reduction target by doing so. This commitment has since evolved to the Courtauld Commitment 2030, which increases the target to 50% from a 2007 baseline, in line with the UN's SDG 12.3.

WRAP is an NGO and registered charity responsible for managing these waste reduction programmes to support the Courtauld Commitment in the UK. They work across all levels of the supply chain to reduce waste. This includes running consumer campaigns, conducting research and creating partnerships around sustainability causes. Food waste is noted as one of their three priority areas for waste reduction (WRAP, 2023).

So far, in the 2022 Progress Report from WRAP, retailers look to be working actively towards the goal, with those reporting in 2018 and 2021 demonstrating an average of

8% reduction in total food waste. This is not consistent however, with producers and manufacturers reporting a reduction of 1.4% in edible food waste between 2015 and 2020, but total food waste, both edible and inedible parts has actually increased by 9%, largely as a result of four key organisations (WRAP, 2022). It could be that where retailers are optimising their supply chains or returning damaged stock, these statistics are sometimes being passed back to manufacturers, counting towards their statistics instead of the retailer's, although this has not been further investigated.

300 food organisations are now committed to working with the WRAP roadmap, working towards implementing the 'Target, Measure, Act' initiative, asking organisations to set goals within each of these areas to work towards the Courtauld Commitment. This includes 97% of the grocery retail sector (by market share) (WRAP, 2022). Overall, WRAP's data demonstrates a 91% overall increase in food redistribution tonnage between 2018 and 2021. The retailers' data from the 15 largest food retail organisations demonstrates a 104% increase in food redistribution tonnage during the same time period.

2.1.5 Food waste statistics in the United Kingdom

This section will initially aim to demonstrate the scale of the food waste problem before taking a deeper look at the intricacies of supply chains and differences between countries and world regions. This allows for a broad overview which should be reflected upon when looking at the deeper contextual data. The impacts of food waste in economic, social, and environmental terms will be considered, as this is a common way in which factors are classified. This is also in line with the 'triple-bottom-line' approach, a method of accounting used to assess economic profit alongside social and environmental impacts.

In a survey undertaken in 2007 by WRAP, a large-scale NGO in in the UK, it was found that 60% of consumers in the UK believe that food waste is, to some degree, unimportant due to the biodegradable nature of food and 75-90% believe that packaging has a greater environmental impact than food waste (Williams et al., 2012; WRAP, 2007). In fact, packaging can help to reduce the overall environmental impact of food and packaging waste if it is designed to reduce the amount of food wasted (Wikström and Williams, 2010), for example, resealable packs, individual wrappings and the durability of the material used.

According to a 2019 Food Waste Trends survey (WRAP, 2020),this attitude has changed over recent years, with 69% of citizens now agreeing that food waste is an issue, and the first three years of the Courtauld Commitment has seen a 7% reduction in food waste per capita. In 2018, the government appointed a Food Surplus and Waste Champion, Ben Elliot, to oversee the UK's progress against the United Nations (UN) Sustainable Development Goal (SDG) 12.3 to halve per capita food waste (GOV.UK, 2018).

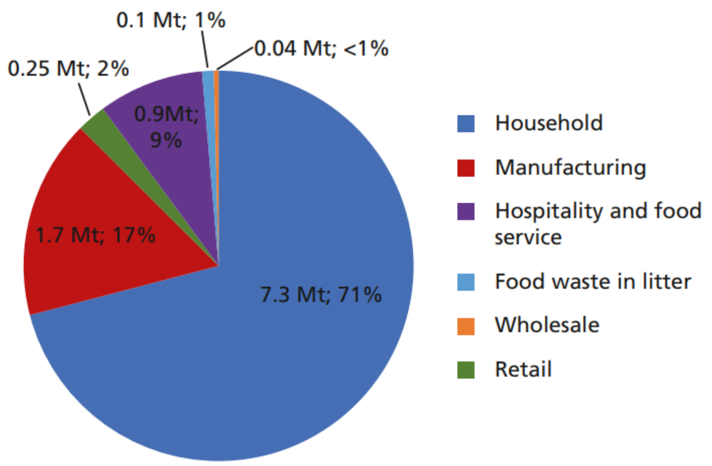
Prior to the Courtauld Commitment a Hospitality and Food Service Agreement was a three-year agreement to cut food waste by 5%. Over 230 supporters agreed to this target. The agreement was successful, reducing waste amongst the signatories by

11%, more than doubling the target, and 24,000 tonnes of food was saved from landfill (WRAP, 2017). Total progress against the UN's SDG and the Courtauld Commitment is cited as 27% between 2007 and 2018 (WRAP, 2020).

In the UK, the government's Department for Environment, Food and Rural Affairs (DEFRA) published a report in 2016 about waste and resource statistics in the UK (DEFRA, 2016). It was highlighted that the majority of food waste - seven million tonnes - occurs at the consumer level, whilst the volume produced at retail, grocery, wholesale and hospitality was 1.2 million tonnes combined. Whilst both are vast amounts, there is a clear weighting towards household consumer waste, which is also reported by the FAO (2011) and Hanson and Mitchell (2017).

The proportions of food waste across the supply chain in the UK (post-farming) are represented visually in Figure 2H, which demonstrates a significant weighting towards households as the main contributors, followed by manufacturing. The figures presented by all three sources, FAO, WRAP and DEFRA, are consistent with each other, which likely demonstrates their validity. Another clear indication from this chart is the difference between waste at the retail level and waste from hospitality and food services. One reason for this could be contractual agreements such as the 'take-back agreement', in which retailers use their buying power to obligate manufacturers to take back any unsold stock (Ghosh and Eriksson, 2019). This could be having an impact on the low numbers at the retail level and the higher numbers at the manufacturing level which is worth considering when looking at the data.

Figure 2H: Food waste at different points in the supply chain (DEFRA, 2017).



Looking at this chart in comparison with the Europe-level statistics presented by Hanson and Mitchell (2017) shows that the UK has slightly more consumer-level waste than the rest of Europe. Taking the percentages from the chart in Figure 2G and removing the 'production' stage in order to make the stages comparable, it shows the following information when compared with the UK data.

Table 2B: Comparative figures for food waste in the UK compared with the figures for the whole of Europe (data taken from DEFRA (2017); Hanson and Mitchell (2017)).

Stage	**Europe**	**UK**
Consumers	67%	71% (Household)
Distribution and market	11.5%	12% (Retail, wholesale, hospitality and food service)
Processing	6.5%	17% (Manufacturing)

Handling and storage	15%	

In Table 2B, the numbers show that at the distribution and market level, the UK is on par with the average across Europe, but has above average amounts of food waste coming from households and below average amounts of food waste coming from the processing, handling and storage stages of the supply chain. Parfitt et al. (2010) highlight, using data from WRAP, that the majority of recovery and reuse activity is done at the manufacturing level, whilst households dispose of the most food waste by a substantial margin.

In 2018, the Waste and Resources Action Programme (WRAP) aimed to quantify food waste in the UK, highlighting that 260,000 tonnes of food waste comes from retail, one million tonnes comes from the hospitality sector and 1.85 million tonnes comes from manufacturing. This supports the figures from DEFRA (2016), further breaking down their 1.2 million figure for retail and hospitality into its component parts. To put this into context with the rest of the supply chain, 7.1 million tonnes came from households, totalling 10.2 million tonnes of food waste in the UK in total in the post-farming stages (WRAP, 2018). Again, these numbers are very similar to the figures from DEFRA, further emphasising the heavy weighting towards consumer household waste and supporting how the waste is divided amongst the stages of the supply chain. These statistics, however, fail to acknowledge the influence of commercial retailers on the amount of household food waste (Brancoli et al., 2017). For example, multi-buy offers such as buy-one-get-one-free and reduced items with short use-by dates increasingly pass potential waste from the retail sector to the consumer (Williams et al., 2012). This also works the other way as retailers often have agreements with manufacturers to ‘buy-back’ any waste products (Ghosh and Eriksson, 2019), thereby potentially skewing the data at the retail point in the supply chain. Parfitt et al. (2010) estimated that such agreements, combined with poor demand forecasting and other contractual agreements cause around 10% of overproduction and waste across the UK supply chain.

DEFRA highlighted that in 2014/15, England was the key UK region in not providing separate fruit and vegetable waste collection, an area in which Wales led the way with a 95% level of food recovery (DEFRA, 2016). This could be an area for improvement in other regions across the UK to improve the amount of food waste at the consumer level which goes into landfill.

In financial terms, the economic impact of food waste is highlighted by WRAP who estimated that £1.6 billion worth of food and drink waste came from the hospitality sector in 2013, with a specific focus on restaurants that wasted £0.6 billion worth of food and drink (DEFRA, 2016).

The DEFRA (2016) report separates food waste into ‘avoidable’, ‘possibly avoidable’ and ‘unavoidable’ food waste. This grading focuses on the ‘feeding people’ level of the Food Recovery Hierarchy (Figure 2D), as these classifications are made on the basis of food being suitable for human consumption or not – and in the process, it fails to acknowledge the role of alternatives such as animal feed and composting. It labels ‘unavoidable food waste’ as that which is no longer suitable for human consumption, but the hierarchy itself demonstrates an opportunity for alternative methods of diversion.

The retail cost in the UK, only for what the Department for Environment, Food and Rural Affairs classify as 'avoidable' food waste for consumers, comes to around £9 per person per week, or 14% of their weekly food expenditure (DEFRA, 2016). Avoidable food waste is defined as any food which was, at one point, fit for human consumption (DEFRA, 2016; Parfitt et al., 2010). Meat and fish (£1.52 per week) and ready meals, followed by fresh vegetables and salad (£1.20 per week) were at the highest cost, with an overall estimate that £480 could be saved per year in each household on avoiding food and drink waste alone. The highest percentage of waste is from bread (32%) (DEFRA, 2016). Hanson and Mitchell (2017) estimate a much higher financial impact of £810 per household per year in the UK as part of a report from the Champions 12.3 project which focuses on the UN's SDG 12.3 and the business case for the reduction of food waste.

2.1.6 UK supermarket food waste

Table 2C shows the results of a content analysis of ten major UK supermarkets, using their websites, information from WRAP, 2019; Kantar, 2023; and Feedback, 2018.

Table 2C: Summary of UK supermarkets' food waste strategies.

UK	Market	Redistribution to people	Animal	Zero	Anaerobic

Supermarket	share (July 2023)		Feed	Waste to Landfill	Digestion
Tesco	27.1%	25,473 (2021/22)	✅	✅	✅
Sainsbury’s	14.9%	4,020 tonnes (2022-23)	✅	✅	✅
Waitrose	4.5%	7,000 tonnes (2017-2022)	❌	✅	✅
Ocado	1.7%	2,200 tonnes (2017)	❌	✅	✅
ASDA	13.7%	4,258 tonnes (2021)	❌	✅	✅
Iceland	2.3%	842 tonnes (2021/22)	✅	✅	✅
Cooperative	5.8%	7,309 tonnes (2022)	❌	✅	✅
Aldi	10.2%	9.8 million meals (2021)	❌	✅	✅
Lidl	7.7%	1,793 tonnes (2021)	❌	✅	✅
Morrisons	8.8%	3 million units (1 million “meals” and 2 million “products”) (2020/21)	❌	✅	✅

Table 2C demonstrates a clear commitment from the UK supermarket sector to a zero waste to landfill approach to food waste. It also shows that the food waste, following any redistribution activity, is directed to anaerobic digestion facilities to be converted to energy, in order to divert it from landfill. Each of these ten supermarkets have committed to the UN SDG and the Courtauld Commitment to halve food waste between 2015 and 2030, with some creating interim targets such as 20% by 2025 to help them work towards this. Tesco has committed to reaching the 50% target five years early, with their target set at halving their food waste by 2025.

2.1.7 Summary

In summary, this section has signified the importance of food waste reduction globally, and efforts already in place from supermarkets to aid in the UK’s contribution to delivering on the UN’s Sustainable Development Goals, 12.3 in particular. The next section will explore the concept of social enterprise, highlighting ways in which food waste can be addressed by such organisations.

2.2 Social Enterprise

Having looked at food waste in detail, this chapter will review literature in the area of social enterprise, aiming to establish a definition to be used within this research, also considering how they operate effectively themselves and with other organisations.

2.2.1 Defining social enterprise

Social enterprise is still the subject of an ongoing definitional debate, and research to quantify the establishment and growth of such organisations is therefore still lacking, as there is some argument over which types of organisations should be included. This section will attempt to summarise the debate so far, leading to a working definition to be used in selecting participants for the research to be carried out for this thesis.

In order to do this, the range of legal definitions used around the world will initially be assessed, followed by the academic definitions in the context of different theoretical viewpoints. This will allow for a thorough understanding of the current progress towards establishing a definition and will also enable a working definition to be established based on the literature to date. This combination of academic and practitioner research to date will help to build a full picture, encompassing the variety of views across the field and how they are currently being applied in practice. The establishment of a definition to use within this research will establish clear boundaries within which to work and will help with comparing results from other studies with the findings from this work.

2.2.2 Legal and operational definitions of social enterprise

Legal and operational definitions are often arrived at much faster than academic ones, as the boundaries are needed for organisations to work within. Such definitions can then be used to establish frameworks and legal forms which organisations can adopt within their business planning. These legal forms can lead a company towards specific funding opportunities, training and development opportunities and marketing prospects focused around the social goal and the legal form, and may include benefits such as tax incentives for the organisation. For this reason, specific parameters must be set for such organisations to define themselves within.

Some governments have set their own definitions of social enterprise in order to introduce new legal business forms for them, with the UK publishing a report in 2017 on Social Enterprise Market Trends (GOV.UK, 2017) which identified that around 471,000 social enterprises exist in the UK out of 5,490,500 companies in total, meaning that between eight and nine percent of UK companies are social enterprises. These estimates were based on data from the 2016 Business Population Estimates survey (GOV.UK, 2017). The legal form, Community Interest Company (CIC), was introduced in 2005 which gives a specific form under which social enterprises can register as an alternative to setting up as a limited company (a traditional for-profit model) or a charity (established for a defined charitable purpose only and all profits must go towards achieving their aims), which means they can share in some of the benefits offered to charitable organisations which would not be applicable to traditional commercial organisations, such as access to funding opportunities. Cooperatives, defined as "businesses owned and run by their members" (Co-operatives UK, 2019), are also often included under the general definitions of social enterprise, as by definition, they benefit their wider community of members.

A number of countries, in response to the growing number of 'social enterprise' organisations, have started to create new legal frameworks for such companies to adopt. Defourny and Borzaga (2001) outlined that by that point, laws had been passed in Italy, Portugal, Greece and Belgium specifically to "promote the development of organisations with social aims" (Defourny and Borzaga, 2001, p.23). This could imply that through the establishment of legal frameworks, social enterprises are able to work more effectively as governments actively promote their development. These earlier forms included the 'social co-operative' status in Italy, Belgium's 'company with a social purpose' and 'social co-operatives with limited liability' in Greece (Defourny and Borzaga, 2001). In the creation of these frameworks, basic definitions had to be applied in order to set the criteria which companies needed to meet in order to set up under this kind of status, thus identifying them as unique to other third-sector, public sector and private sector organisations and setting out their differentiations. Definitions vary between countries, and there are also significant differences between definitions in Europe and definitions used in the United States of America (USA) (Kerlin, 2006). A summary of these definitions and frameworks follows in Table 2D.

Table 2D: Summary of legal definitions and frameworks.

Country	**Legal form**	**Explanation**	**Definition used**
United Kingdom	Community Interest Company (CIC)	“A CIC is a special type of limited company which exists to benefit the community rather than private shareholders” (GOV.UK, 2019). “CIC’s are required by law to have provisions in their articles of association to enshrine their social purpose” (GOV.UK, 2011, p.3).	“A business with primarily social objectives whose surpluses are principally reinvested for that purpose in the business or in the community, rather than being driven by the need to maximise profit for shareholders and owners" (GOV.UK, 2011, p.2).
United States of America	Low-profit limited liability company (L3C)	“L3C firms use a marketplace approach to solve social problems” (Artz et al., 2012, p.232).	“L3Cs explicitly aim to provide societal benefits” and “profit cannot be the sole driver of the firm” (Artz et al., 2012, p.232).
	Social purpose corporation (SPC)	A more traditional for-profit corporation in the states of California, Washington and Florida, which also includes a social aim. They pursue both financial and social goals. They are not ‘obliged’ to consider social goals in decision-making but ‘may’ do so (501 Commons, 2019).	A state-registered SPC operates its business “in a manner intended to promote positive short-term or long-term effects of, or minimise adverse short-term or long-term effects of, the corporation’s activities upon any or all of (1) the corporation’s employees, suppliers or customers; (2) the local,

			state, national or world community; or (3) the environment.” (501 Commons, 2019).
	Benefit corporation	“A Benefit Corporation must consider societal and investor interests, but individual firms decide which interest is to be given slightly more weight in decisions” (Artz et al., 2012, p.232).	“Firms with the corporate purpose to create a material positive impact on society and the environment” (Artz et al., 2012, p.232).
Italy	Social cooperative	“Social cooperatives are orientated towards aims that go beyond the interest of the business owners, the primary beneficiary of their activities is the community, or groups of disadvantaged people. Law 381/91 distinguishes between two categories of social cooperatives, those producing goods of social utility, such as culture, welfare and educational services (A-type), and those providing economic activities for the integration of disadvantaged people into employment (B-type).” (Villotti et al., 2014, p.57)	“All institutions can acquire the status of social enterprise […] if they are a stable and principal activity business of general interest, nonprofit and for civic purposes, solidarity and social utility, adopting modalities of responsible and transparent management and favouring the widest involvement of workers, users and other subjects interested in their activities” (Normattiva.it, 2017).
France	Social and Solidarity Economy Enterprise	“The ESS law revolutionised French social enterprise law by defining the values of a social and solidarity economy enterprise regardless of its legal form” (ESELA, 2016).	A Social and Solidarity Economy Enterprise “must have a democratic governance, must pursue a purpose other than sharing profits, and must devote the majority of its profits to

			the objective of maintaining or developing the enterprise's social mission" (ESELA, 2016).
Greece	Social cooperative enterprise	"A Social Cooperative Enterprise (SCE) is equally managed by its members and its purpose is to ensure collective benefits, whereas its profits come only from activities of social interest" (Startup Greece, 2011). Social Cooperative Enterprises fit into one of three categories – integration, social care or collective and productive SCEs.	"A Social Cooperative Enterprise (SCE) is a civil-law cooperative with a social purpose and limited liability for its members, possessing entrepreneurial capacity by law" (Startup Greece, 2011).

It is clear from this table that there are differences between each country's definitions. Due to the disparities in operational definitions used across the world, it is clear that there is not a universal agreement on what a social enterprise is. It is then useful to turn to academic literature, where researchers have investigated and studied the phenomena of social enterprise for a number of years. However, there is a similar level of disparity there too, perhaps due to these operational differences and how such a wide range of different organisations can define themselves as social enterprises under different definitional contexts. Some of these key debates can be discussed in line with theoretical perspectives from the authors, whilst also remaining aware of the operational definitions which are currently being used to define such organisations.

2.2.3 Academic definitions of social enterprise

Whilst a fully accepted academic definition for social enterprise has not yet been established, there has been a wide range of discussion in the literature on this topic, focusing on what should be included and what elements of a social enterprise make it a separate, differentiated entity. Teasdale (2012) suggests that the definitional inconsistency is due to the “fluid and contested” nature of the concept (Teasdale, 2012, p.99), which he argues is in part due to policymakers who wish to apply the concept in multiple different ways in order to meet their own needs, utilising a combination of the positive aspects of each different type of company who claims to be a social enterprise to help achieve their own goals. This could include social welfare, healthcare, social care or employment – a government could choose to support social enterprises in different ways, defining them in order to help meet their immediate priorities. This is in support of similar observations from Bland (2010) as part of a Finnish government publication regarding the UK social enterprise sector. This would also prove consistent with the findings regarding the legal and operational definitions of social enterprise, where it was identified that the definitions used between countries are often somewhat different from each other, which may provide an insight into the country’s priorities but also into what they want from their social enterprise sector. This places a potential responsibility on social enterprises to fulfil a government’s commitments.

Diochon and Anderson (2009) cite the differences identified by Mair and Martí (2006) between the “economic entity, the individual and the process” (p.8) as social enterprises, social entrepreneurs and social entrepreneurship respectively, identifying them as the three key focal points of the definitional landscape. However, it is also noted that the debates around definitions not only exist within each of these focal points but also across them, which could imply that even this distinction has not been universally accepted. Indeed, Peredo and McLean (2006) find that the terms social enterprise and social entrepreneurship are often used interchangeably by researchers which is an additional complication in identifying a clear and universally accepted understanding of these terms.

Defourny and Borzaga (2001) describe social enterprise as an organisation with an "entrepreneurial spirit focused on social aims" (Defourny and Borzaga, 2001, p.2). They go on to identify a set of nine criteria that aim to summarise the individual 'social' and 'enterprise' elements of social enterprise organisations. In setting these nine criteria, the authors were primarily studying a selection of welfare services offered by social enterprise organisations as opposed to those focusing on addressing social issues. This is a limitation which is also highlighted by the authors as they acknowledge that the breadth of social enterprise is much wider than just the provision of welfare services. However, it is still important to consider in the context of the definition debate as it could still prove to be applicable elsewhere.

Social enterprises work within a range of different sectors, providing a wide variety of products and services. Some examples of where social enterprises have taken on the role of public services include: child-minding services in Austria, which have been professionalised through social enterprise and the cooperation between parents and service providers; home care cooperatives in the UK which have been founded as a result of failures within the public system; and provision of social services in Italy for groups such as disabled people, the elderly, drug users and young people with family difficulties (Defourny and Borzaga, 2001). This is supported by Eikenberry (2009) who uses resource dependence theory to suggest that non-profit organisations adopt commercial practices as a solution to a decrease in funding from other sources such as governments. Country variations are explained in terms of the social and economic development of different countries, including such structures as welfare state, employment, social cohesion and how social capital is built up (Defourny and Borzaga, 2001; Kerlin, 2010).

Kerlin (2010) suggests that the socioeconomic context of a region affects how social enterprise activity is defined. The author examines seven world regions across four socioeconomic factors – market strength, international aid, civil society and state influence. A high level of consistency was found between the social enterprise sector in each region and their strongest socioeconomic factor(s). This would clearly have an impact on the definitions used by each of the world regions, perhaps even suggesting that a blanket worldwide definition cannot actually exist. This adds a layer of complication to the debate around defining the term ‘social enterprise’ but is important to acknowledge. Subsequently, the debate must continue with this in mind and any definition used should either incorporate these differences or limit its applicability to a certain region, making it geographically contextual, in the case of this research, to the UK.

2.2.3.1 The external conceptualisation of social enterprise in relation to other entities

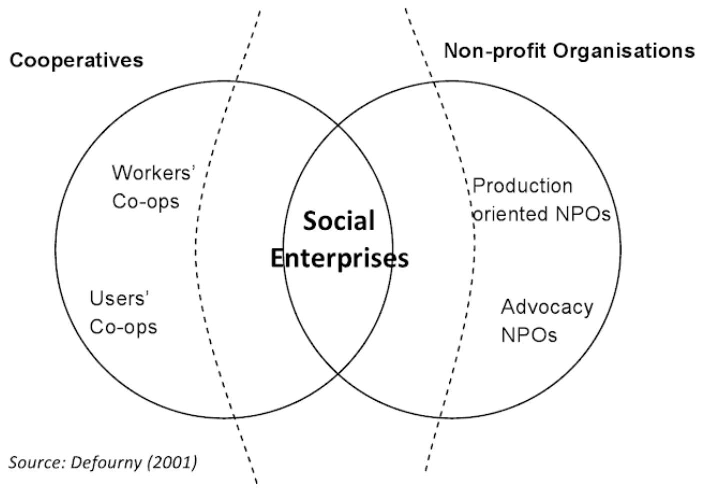
Defourny and Borzaga (2001) wrote extensively about what makes a social enterprise unique and innovative when compared with traditional nonprofit and for-profit organisations, which may help in establishing a definition unique to social enterprise. A traditional non-profit organisation, often set up as an unincorporated association in the UK, is a company such as a community group which does not seek to make a profit. Charities can also be classed as non-profit organisations. A non-profit organisation is often differentiated from a social enterprise by how income is generated – a non-profit may rely on donations and grants, whereas a social enterprise is more likely to generate its own income from the sale of goods or services. A for-profit organisation is the opposite – a company whose primary purpose is to generate income and profit for shareholders and managers, with any social aims secondary to financial goals. Such organisations often practise ‘corporate social responsibility’ in order to contribute to their social aims, but this is not a core function of the organisation.

In addition, cooperatives are often discussed separately, as they are generally financially sustainable through the products or services they sell (Teasdale, 2012). Some have social aims at their core, however, others do not. So, in applying the common themes from the definitions identified, those who do have a social aim (composting business which aims to reduce food waste, a home care agency which provides free training to low-income or unemployed women, the distribution and retail of Fairtrade products from cooperatives in developing countries) would be classed as social enterprises, but others (for example, cooperative grocery stores and banks) would perhaps not. It could be argued, however, that any cooperative benefits a wider community than a traditional for-profit might, as by its nature it has a social impact on its members.

Social enterprise, in relation to the third sector, does not fit easily into the pre-existing definitions. The third sector includes the range of organisations which are not classified as ‘private sector’ or ‘public sector’, and are often independent of government, value-driven and reinvest any surplus into addressing their goals (National Audit Office, 2010). Spear and Bidet (2005) state that social enterprises sit within the third sector, in between the public and private sectors, and the National Audit Office (2010) includes social enterprise in its definition of the third sector, yet by combining its own definition with these academic models, this cannot entirely be the case, as profit-generating social enterprises would be excluded. The concepts of the ‘social economy’ (profit-making social enterprises including cooperatives) and the ‘non-profit sector’ aim to define all organisations within them homogeneously, but social enterprise fails to conform to all parts of such definitions, and as such, does not properly align with them, instead appearing to share and combine elements of both the social economy (such as co-operatives) and non-profit organisations (Defourny and Borzaga, 2001). The dynamic nature of social enterprise is difficult to fit into these static definitions, even to the point where social enterprise is yet to be truly defined.

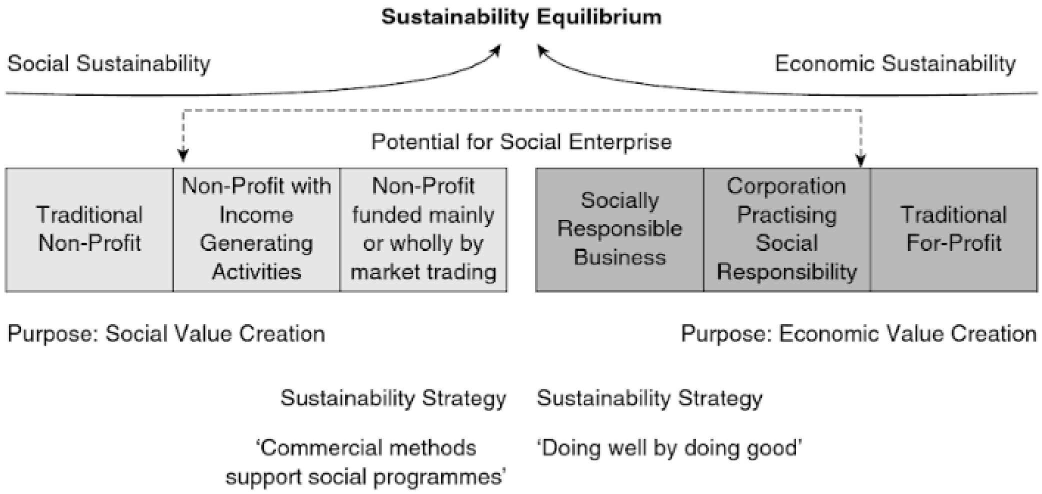
Figure 2I demonstrates an early thought process around how social enterprise fits with existing structures. It does, however, omit the inclusion of for-profit organisations, which social enterprises also have some commonalities with. They are considered here as an intersection between cooperatives and non-profit organisations, yet the dotted lines indicate that some organisations from each category are also social enterprises without including properties from the other. This suggests that for-profit organisations should be included here, as a non-profit cooperative would fall into the intersection, but the figure highlights that some cooperatives which are not non-profit (and are therefore for-profit) could also be social enterprises.

Figure 2I: Social enterprises at the crossroads of co-operatives and the non-profit sector (Defourny and Borzaga, 2001, p.22).



A more common approach in recent research is to view social enterprise on a continuum or spectrum. There is some debate about what should be at each end of such models. The social enterprise ‘sustainability equilibrium’ (Figure 2J) was developed by Alter (2007) and adapted by Ridley-Duff and Bull (2011). It demonstrates how they believe social enterprise could potentially fit into a number of different categories.

Figure 2J: Social enterprise sustainability equilibrium (Ridley-Duff and Bull, 2011).



It is clear from this diagram how the more commercial, for-profit organisations could also potentially be social enterprises. The multi-stakeholder structure of social enterprises demonstrates that they could also compete to occupy a market share alongside for-profit organisations (Defourny and Borzaga, 2001). It puts the social enterprise at all stages between the traditional non-profits and the traditional for-profits, although it could also be argued that a ‘corporation practising social responsibility’ does not meet some of the criteria listed by Defourny and Borzaga (2001) for being a social enterprise.

From this continuum, some existing definitions would appear to fit social enterprises primarily in the 'Socially Responsible Business' and 'Non-Profit funded mainly or wholly by market trading' boxes. The second one would only apply, however, if a profit is made but is reinvested into the company.

Teasdale (2012) attempts to explore the definitions suggested in academic literature and apply them to policy and practice by relating the definitions to different organisational forms of social enterprise in England. The author applies two dimensions which were drawn from consistencies in previous definitions – relative alignment with social or economic goals, and "the degree of democratic control and ownership" (Teasdale, 2012, p.101). This is represented in Figure 2K below, taken directly from Teasdale (2012).

Figure 2K: Social enterprise organisational forms and discourses (Teasdale, 2012, p.102).

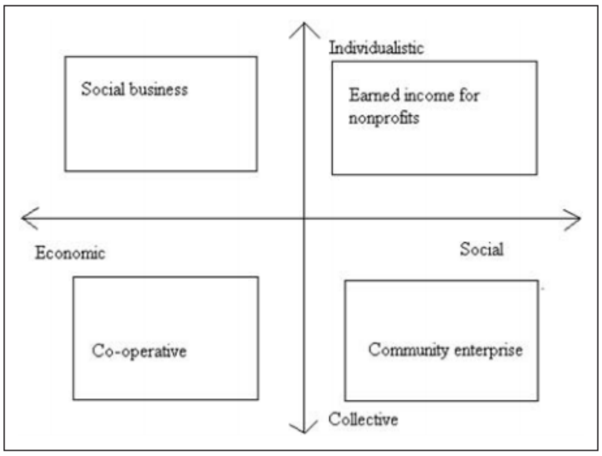


Figure 2K aims to demonstrate how the range of organisations classed as social enterprises can be positioned within a framework to assist with understanding. This can then help with establishing the boundaries for classification and therefore help to contribute towards the creation of a definition. The term ‘social business’ is differentiated from social enterprise, as it is clear from Figures 2I, 2J and 2K that non-profit organisations are included when defining social enterprise. The word ‘business’ is associated with profit-making activity. It is not clear how a community enterprise is differentiated from a charity or a community organisation if the goal is not economic. This figure combines ideas from Figures 2I and 2J and it could be argued that the two boxes on the ‘economic’ side of the framework are slightly more applicable to defining social enterprises in the context of achieving sustainability through trading as per the definition from Defourny and Nyssens (2007), as some level of economic focus is required.

Young and Lecy (2014) contribute to this debate, adding that the spectrum approach adopted by the EMES (l'ÉMergence de l’Entreprise Sociale) European Research Network places organisations on a continuum in accordance with its balance between social impact and profit-making. They instead propose the adoption of a ‘social enterprise zoo’ metaphor, in which the organisation types are different ‘animals’ which all have different needs and adapt their social and profit-making goals in different ways. They can be differentiated between but also referred to collectively in this way.

2.2.3.2 The internal conceptualisation of social enterprise activities and people

Theoretically, many studies emphasise the importance of relationships within social enterprises and draw on relationship-driven theories to highlight this. Each of these theories can assist with the definition debate, as understanding the purpose of a social enterprise and attempting to explain their existence helps us to work towards defining them. Evers (2001), for example, introduces social capital theory to social enterprise, which again emphasises the importance of relationship-building in the success of a social enterprise. This theory has been used extensively in the study of social enterprise, which is a separate ongoing debate in the field. As social capital is developed through strong networks, social capital theory is often used to emphasise the focus on the importance of social capital to the success of a social enterprise.

Diochon and Anderson (2009), in an attempt to address the lack of a clear conceptualisation for social enterprise, created a typology under which social enterprises could be classified on a number of different continuums. They considered the process components within social enterprises rather than the entities themselves, focusing on activities and people within the organisation, and suggested that there are two “polar opposite ideal types” (p.7) of social enterprise. At one end, the not-for-profit organisations trade and reinvest all of their profits back into achieving their social aims, and at the other a more traditional entrepreneurial organisation is used as a “strategy for achieving social aims” (p.7).

They also seek to consider the effectiveness of a social enterprise, suggesting that the further toward the more traditional entrepreneurial end of the continuum an organisation is, the more effective it is – effectiveness, in this case, is defined as being both innovative in addressing a social goal and the degree to which the organisation is self-sufficient. A very broad definition of social enterprise is adopted by Diochon and Anderson (2009) following their review of definitions used prior to their research, which is simply stated as “identifying an opportunity to improve social well-being, then acquiring and employing the resources required to do so” (p.11). Theoretically, they use an adaptation of the early congruence model of organisational effectiveness produced by (Nadler and Tushman, 1980), which states that the environment has a key role in shaping the strategy, and therefore ultimately the processes, used by an organisation.

Bacchiega and Borzaga (2001) use the institutional theory of organisations to study social enterprise, finding that interpersonal relationships create a sense of belonging amongst both voluntary and paid staff members, which in turn provides additional benefits such as increased productivity, happier staff and a drive which creates a trusting relationship between all levels of the hierarchy – things which may be more difficult to establish in a traditional for-profit organisation. Dart (2004) continues with this work, arguing that the legitimacy of social enterprise can be defined by the market and that the adoption of commercial practices to meet social needs is due to the acceptance of the public that such structures work best.

Peredo and McLean (2006), however, adopt a slightly different continuum, and suggest that the social goal does not necessarily have to be at the forefront of the organisation’s goals. Their continuum ranges from those who are driven only by their social aim to those who pursue a social aim, but profit is prioritised. This is an exception to the commonalities set out by Defourny and Nyssens (2007) and Peattie and Morley (2008) who identified that the consistently common themes across each of the definitions of social enterprise were the prioritisation of social goals and the significance of trading in the organisation. Drawing on the work of these authors, it can be summarised that a social enterprise lies on the border between a non-profit organisation and a commercial business. It combines the aims of both to create a sustainable organisation which prioritises social aims using commercial strategies, either individually or cooperatively.

However, in order to be a sustainable business, profit is generally a requirement. It could be said, from the definitions in the literature, that in order to be classed as a social enterprise, a profit must be made, but that profit can be reinvested back into the company (which would classify it as a non-profit under current frameworks) or it can go to shareholders, as long as a significant contribution is being made to the company's social aim. The important feature is that this social aim is at the core of the business mission, prioritised in decision-making, with all activities directed at addressing that social aim. Financially, the organisation should be made sustainable primarily through its trading activity, independently of grants and government funding, although some contribution from such funds for start-up, growth and development is acceptable in the same way as a commercial organisation would be classed as sustainable in this way.

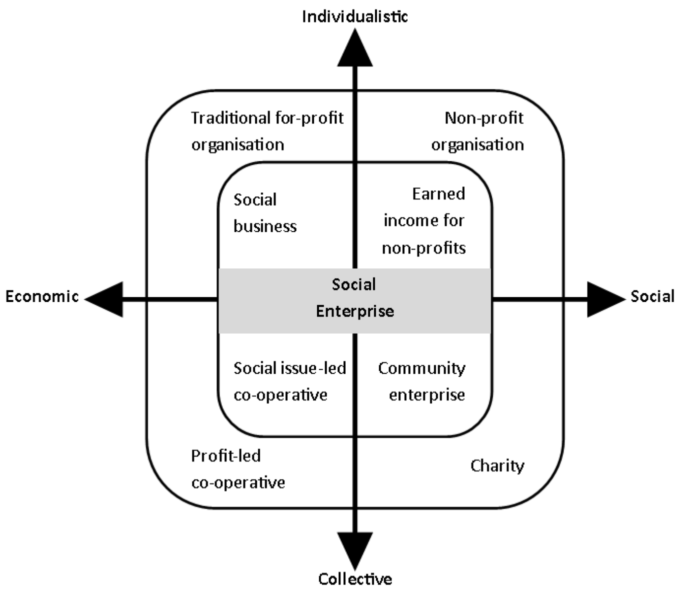
For example, using this definition, a charity with high street shops would not be classed as a social enterprise. It does meet the requirement of a social aim at its core, but whilst there is trading activity involved, it does not gain the majority of its funding from such activities, instead much of it comes from government grants and other funding opportunities. However, a typical zero-waste shop would be classed as a social enterprise. It has a social aim (no packaging waste, no plastic and reduced food waste) and it achieves sustainability primarily through its trading practices. Such trading practices are not limited to products – services can also be traded. Therefore, a company that sells a technological product to help restaurants understand which food items are most often wasted, or an app-based company who offers a food redistribution sharing platform would also both be classed as social enterprises under the assumption that the social aim, food waste reduction, is their primary goal and at the core of the business purpose. This also fits with the definition from Mair and Marti (2006) – “a process that catalyses social change and addresses important social needs in a way that is not dominated by direct financial benefits for the entrepreneurs” (Mair and Martí, 2006, p.36).

2.2.4 Development of a definition of social enterprise to use within this research

From the existing research, the framework identified by Teasdale (2012) considers how social enterprises can be categorised along two axes, and identifies where four different types of social enterprise would fit within that framework.

Considering this model within a wider contextual network can help with the positioning of social enterprises, not only by identifying differences between types but also by situating that more broadly in the sector. Expansion of the axes can help to identify other organisations which exist within these parameters and then situate social enterprise within that. It is important to view the axes as a spectrum as opposed to an either/or decision, as we would expect that social enterprises sit close to the centre of the Economic/Social axis, demonstrating attention to both within the organisation. It seems important to also show on the diagram that if an organisation sits at either end of the spectrum, then they are not classified as a social enterprise.

Figure 2L: Adaptation of framework from Teasdale (2012, p.102) expanded to encompass a wider contextual network surrounding social enterprise.



It can be seen in Figure 2L that the four central boxes are where the proposed definition would situate social enterprise. For the purpose of this research, and based on the literature summarised above, the proposed working definition is as follows:

A social enterprise is a financially sustainable organisation which is primarily achieved through trading of a product or service. It prioritises a social goal above all else, whether non-profit or for-profit, and exists in the interests of its societal beneficiaries.

2.2.5 What helps to make a social enterprise operate effectively?

Effectiveness as a measurement is difficult to quantify, so it should be established what is actually being investigated in order to identify an appropriate measurement. According to Chaudhuri and Acharya (2000) who studied the effectiveness of a system which demonstrates product quality, the assessment of how to measure effectiveness comes from distinguishing the backbone of your research subject and identifying measures which are quantifiable, logical and objective.

Diochon and Anderson (2009) consider processes within social enterprises and how their effectiveness is dependent on certain configurations which assist with the development of entrepreneurship. They define effectiveness as “innovation in dealing with the challenges of social exclusion and marginalisation; increased self-sufficiency and sustainability” (Diochon and Anderson, 2009, p.8). Using this definition, it is still difficult to quantify such measures, thus when establishing a definition, measurement techniques should also be included. They state later in the paper that the difficulty in establishing a measurement for effectiveness comes from the heterogeneous nature of social enterprises and the inconsistencies in their priorities both between organisations and for any individual organisation over a given time period. This will be an important consideration for this research.

As previously discussed in section 2.1, laws have been passed in a number of countries including Italy, Portugal, Greece and Belgium specifically to "promote the development of organisations with social aims" (Borzaga and Defourny, 2001, p.23), and new legal frameworks are being introduced. This could imply through the establishment of such frameworks, that social enterprises are able to work more effectively as the governments are actively helping to promote their development. It is also the case that access to further support and funding may be available specifically to organisations within these legal frameworks which could also increase effectiveness. However, in the absence of any holistic or summary data on how such support and funding has helped with effectiveness, this is again difficult to quantify.

It could be of interest to compare the impacts of those organisations registered under these new frameworks and those which use alternatives, as this may provide some data about the effectiveness of these frameworks in assisting social enterprises in their aims. The role of managers in establishing the legitimacy of social enterprises is discussed by Borzaga and Solari (2001). Managers ensure that the social enterprise operates as efficiently as it can do by identifying suitable governance forms, but also ensuring a strong organisational design and working on fair human resources practices, thereby also overcoming internal weaknesses more effectively than other third-sector organisations might.

Looking a little more broadly at effectiveness in non-profit organisations could help to identify measures of effectiveness. Iwu et al. (2015) identified that “both financial and non-financial criteria were equally essential” for this type of organisation. Within this, they identified two factors which generally indicate effectiveness – “the full achievement of its mandate” and “the ability to run business projects to cover cost”. This is directly relevant to social enterprises who must be financially sustainable in addition to working towards their social aims. Others argue that financial criteria are less important for non-profit organisations (Cheverton, 2007; Gomis et al, 2011; Uphadaya et al, 2014), however, in the case of social enterprise, this is a key criteria for them by definition.

2.2.6 How do social enterprises work with other organisations?

Social enterprises can work closely with commercial organisations to achieve a common goal. For example, in the area of food waste reduction, large supermarkets collaborate to divert their food waste from landfill. Doyle (2013) suggests that Local Enterprise Partnerships should incorporate organisations such as social enterprises and universities to assist with economic development, taking a ‘whole place’ approach to developing innovative solutions to socio-economic challenges.

Social enterprises can work with larger corporations strategically in different ways, depending on the vision for the collaboration (Huybrechts et al., 2017), but generally working towards a reconciliation of economic and social goals for both organisations (Di Domenico et al., 2011). It would seem that whilst these goals must align somewhat in order for the collaboration to be successful, there are different approaches which can be taken by both parties depending on the needs of each party, which must be justified by the social enterprise on either pragmatic or moral grounds, or a combination of both (Huybrechts and Nicholls, 2013). Whilst the pragmatic approach would be based more on logistical factors, perhaps allowing them to take what they need from the relationship, the moral approach would be more selective and would require greater alignment of social goals. This demonstrates the different reasons that social enterprise organisations may choose to collaborate with commercial entities.

Of course, some social enterprises are commercial organisations themselves, sometimes known in the literature as a ‘hybrid’ organisation (Doherty et al., 2014). However, from some of the identified definitions, some social enterprises have a higher focus on the economic bottom line than others whilst still being classified as social enterprises. This indicates that the ‘hybrid’ organisation may be difficult to differentiate from a social enterprise without further refining their definitions. For the sake of this research, the social enterprise term will be used to incorporate hybrid organisations where necessary and only where they fit with the definition identified in section 2.2.4.

2.2.7 What influence can social enterprises have on policy-making, implementation and compliance with the new policy?

According to Borzaga and Defourny (2001), the so-called ‘third sector’ is so important to the economy that it “is now such that it is broadly associated with the major economic roles of public authorities” (Borzaga and Defourny, 2001, p.1). This means that organisations such as charities, NGOs and social enterprises have found a key role in offering public services and resources that governments have traditionally provided – a model which many countries, including the UK, are now moving towards. This also means an indirect influence on policy-making, as their involvement in service provision gives them a line of communication with policy-makers and can lead to impact.

Evers (2001) discussed the influence of social enterprise on public policy through the lens of social capital theory. The notion of ‘civic capital’ is considered at length, which encompasses resources which are not market or state-based but include things such as cooperation and openness to dialogue which are essential components of the success of a typical social enterprise. This is applied to public policy as the researcher suggests that social enterprises and how they build social capital should be rewarded by policy makers as they promote and mobilise sections of society around social issues.

Gawell (2013), on the other hand, discusses the concept of social enterprise in terms of their actions within society and their potential for impacting social change, attempting to analyse whether they exist as “innovative challengers or adjustable followers” (Gawell, 2013, p.214). It is concluded that they can, in fact, be both, and indeed go on to emphasise the importance of being both. Using a set of case studies, the question of ‘how’ is answered, summarised across three main aspects. The three aspects referred to by Gawell (2013) indicate the potential impact a social enterprise can have on society, and they can be directly compared with some of the definitional work, particularly from Defourny and Nyssens (2001).

The first is in the creation of organisational practices, sometimes unique ones, in order to satisfy the focus of the organisation which often subsequently becomes its mission. Within this aspect, the common use of a bottom-up approach within social enterprise is referred to, or even a “from the side” approach which Gawell (2013) defines as an initiative started by a concerned fellow human being as opposed to someone who has personally experienced the perceived injustice which the organisation aims to address (the bottom-up approach). This is corroborated by Borzaga et al (2016) who also discusses the extensive use of such approaches within social enterprise. This is an example of how a social enterprise often takes an alternative approach to addressing a societal issue than traditional structures allow. This unwavering focus on a social mission can be compared to the definitional criteria from Defourny and Nyssens (2001) that a social issue must be at the core of a social enterprise’s mission.

The second is around the negotiation of roles within society, and how social enterprises that provide a service often also partake in advocacy or activism around the social issue they are focusing on. Whilst this might not completely differentiate them from other forms of organisation, it is identified as a commonality between the cases studied. A social enterprise can differentiate itself from a charity in this way as the campaigning work is often primarily funded through the trading of a product or service as opposed to public funding or grant income. This is also a factor in defining a social enterprise, according to Defourny and Nyssens (2001).

Third, and somewhat related to the second aspect, Gawell (2013) goes one step further than the impact on society to discuss the impact that a social enterprise can have on how the world is viewed and operated within. Ideas from social enterprise founders can often be unique, operating from a different viewpoint on an issue, in many cases by someone who has experienced or is experiencing such issues themselves, as referred to in the first aspect. This can lead to new research, new knowledge and new ideas, which can be integrated later into public agendas, as seen, for example, in Sweden (Gawell, 2013).

Each of these approaches suggests that social enterprises can and do have influence on policy in a variety of ways. This could be through direct public service provision, advocacy, research or new approaches to social issues which can then help to shape the future of public policy.

2.2.8 UK social enterprise sector

As discussed in section 2.2.2, the UK has incorporated a legal form for companies such as social enterprises called a Community Interest Company (CIC). Whilst many social enterprises are registered under this legal form, many also incorporate as charities or use other forms such as limited companies, partnerships and sole traders. This variety makes it difficult to fully assess the social enterprise sector in the UK, other than through surveys, market research or in-depth research studies, including desk-based research. Social Enterprise UK take a bi-annual survey of their own members, plus members of other similar organisations, which in 2021 yielded a response rate of 890 in their 2021 survey out of a potential 10,000+ respondents. The UK government also commissioned the University of Middlesex to produce social enterprise market trends reports using data from the BEIS Longitudinal Small Business Survey, which in 2019 gave a sample size of 945 social enterprises.

The UK social enterprise sector is growing fast, with 47% of UK social enterprises less than five years old as of 2021 (Social Enterprise UK, 2021). They deliver across economic, social and environmental goals, with 74% either making a profit or breaking even, 22% operating in the most deprived areas of the UK, and 84% prioritising the importance of socially and environmentally friendly products over cost (Social Enterprise UK, 2021). The UK government survey estimates that there are 131,000 social enterprise organisations in the UK, with 35,000 operating under legal forms which restrict their distribution of profits, such as CICs and charities, acknowledging the complexity of identifying social enterprises through CIC data alone.

The 2021 edition of the bi-annual survey taken by Social Enterprise UK focuses on post-COVID growth and sustainability of the organisations, and demonstrates an overall very positive picture, with “44% reporting increased turnover and 35%

reporting decreased turnover (compared to an 18% increase and 56% decrease for the rest of business)” (Social Enterprise UK, 2021, p.7).

2.3 Theorising the role of social enterprises in food waste management

In order to understand how social enterprises work with supermarkets on food waste management, it will be important to theorise about these relationships in order to analyse them. With no current theoretical contribution made so far in the wider literature, it is useful to review similar, adjacent sectors such as supply chains and food networks more broadly, or social enterprise research in different areas. In this chapter, several theories are identified and their suitability for this research question assessed.

2.3.1 Theories considered

A number of theoretical positions have been considered in the planning of this research on the basis of their use in relevant literature, whether social enterprise, food waste, supply chain or other organisational management literature. These include social capital theory, social impact theory, goal systems theory, resource dependency theory, attribution theory, integrated supply chain management theory, principal agency theory, institutional theory, social exchange theory and control theory. These theories were investigated due to their relevance in supply chain literature, as summarised by Chicksand et al (2012), and in social enterprise literature.

In reading more about some of these theories, assessing their relevance and considering them in the context of the research topic, a number of potential options were identified.

2.3.1.1 Social impact theory

Social impact theory is based in the field of Psychology and was developed by Bibb Latané in 1981. By definition, social impact describes the influence of a person's behaviour or actions on the feelings, thoughts and behaviours of another individual (Latané, 1981; Nowak et al, 1990). Social impact theory therefore draws on this definition to establish the factors involved in the creation of this influence, identifying three factors which act in collaboration to create impact (Latané, 1981). These factors are strength (the significance, intensity or power of the source), immediacy (physical or timely proximity) and the number of sources of influence. In the context of food waste management, it could be hypothesised using social impact theory that companies are more likely to either take action or comply with regulations if others do. In literature relating diffusion of responsibility to social impact theory (Latané and Nida, 1981; Snook, 2000), it could also be said that because food waste is a global issue where everyone is a stakeholder, the responsibility is constantly diffused which then leads to nobody voluntarily taking action. This creates a cycle which is difficult to break, as when there are no social influencers and an absence of all three of Latané's factors, it is more difficult to convince others to be the first to act.

Social impact theory has been used in a number of studies in supply chain research, particularly in the field of consumer behaviour and sustainable practices. This includes a study on consumer behaviour and recycling in China (Chang et al, 2020), identifying that immediacy, persuasiveness, and supportiveness positively influences consumers' ethical beliefs, a study in Saudi Arabia on using Twitter to promote food banks in order to raise awareness of food waste (Alkorbi et al, 2022), and a consumer behaviour study on the supply chain impact during COVID-19 (Mensah et al, 2023). It was determined that this theory may be more applicable at the consumer stage of the supply chain rather than the retailer stage, and so was disregarded for use in this study.

2.3.1.2 Goal systems theory

Goal systems theory also originates in Psychology, and theorises that individual motivations are affected by stored mental representations which can be learned, altered or activated (Kruglanski et al, 2002). For example, people who choose to be vegan have different mental representations of animals than those who do not, but often those individuals make a conscious choice to change that representation based on certain influences. Goal systems theory is characterised by its focus on motivations - their ability to change and the potential for intrinsic or unconscious motivation. This is where there is a potential connection to social impact theory - the ability of others to influence the thoughts and behaviours of an individual, thereby changing their mental representations and, as a result, their motivations. This theory, with its focus on unconscious motivation and the potential for dynamism in cognition, states that when goals and motivations are altered, behaviour changes, and this can be done subliminally through the actions of others. This theory could be used in this research where regulation and social enterprises are aiming to change behaviours surrounding food waste diversion and use of alternative methods to avoid landfill.

There has been some limited precedent for using the theory in this way, with one study suggesting that attendance at eco-friendly events could induce favourable eco-friendly behaviours beyond the event itself (Wong et al, 2022), and another focusing on non-economic objectives in family and non-family SMEs (Randolph et al, 2019). Ultimately, again this theory was found to be too focused on consumers, and therefore was less applicable to this study.

2.3.1.3 Social capital theory

Social capital theory is often used in social enterprise research, and is defined as the resources within social connections which can be used to facilitate collective action (Putnam et al, 1994). According to Putnam et al (1994), social capital refers to social connections and the norms of reciprocity and trust that arise from such connections, which can then facilitate co-ordinated action. The notion of reciprocity may not be as strong in the food waste scenario, as it involves asking people to do something with their waste, which may not provide them with anything tangible in return. It could, however, provide them with a feeling of responsibility or that they are doing something good. Consideration should be given to whether that is enough to instigate action. Social capital theory also relates to the purposeful expansion of a network (personal or corporate) where the new relationship grants access to resources which could lead to improved outcomes for the individual or group (Lin, 2002). A wide-ranging concept which has been studied from multiple angles, the core principle involves the significance of the value of these networks in achieving a goal. This could therefore infer that business ethics such as goodwill and good citizenship are prominent within such relationships in order to maintain them effectively (Russo and Perrini, 2010). Based on this, social enterprises would likely have an inherently high level of social capital due to the foundations on which such organisations are built. Social capital theory was used by Evers (2001) to explain the “multiple goal and resource structure of social enterprises” (Evers, 2001, p.296). It was highlighted within this that social capital is an important part of the development of social enterprises. Since then, social capital theory has been used and debated extensively in social enterprise literature (Laville and Nyssens, 2001; Chell, 2007; Lin and Erikson, 2008). Governments often try to establish good relationships with companies (local companies, in particular). Their networks are likely to be wide-ranging, but given the nature of this position, the same elements of transparency and goodwill may not be as common, and so perhaps their social capital is not as significant. This could have an effect on how legislation is received by companies and their likelihood of compliance.

For this study, this theory was a possibility, however, due to its focus on individual relationships, it was perceived that a more organisation based theory was more appropriate.

2.3.1.4 Network theory

Network theory is a sociological theory, which focuses on the relationships between stakeholders in a network and how these networks can influence an outcome (Wasserman and Faust, 1994). In social enterprise and food waste research, this could be a useful approach in providing a better understanding of the supply chain for food waste and how social enterprises fit within that network. Hence, there is already a large body of supply chain research which utilises network theory, most recently in studies such as applying network theory to resilience in supply chains (Chen and Wen, 2023), and blockchain in supply chain management (Munnia et al, 2023; Vitale, 2023; Patil, 2023). Network theory has also been applied in the context of food waste, for example in studying the creation of novel food waste management systems (Ghinoi et al, 2020), the overlap between waste and political ecology (Rath and Swain, 2022) and identifying non-human actors in retailer food waste (Alhonnoro et al, 2020). Network theory is an organisational theory, meaning that it is used in the study of organisations, their nature and behaviours and the environment within which they are situated (Miner, 2005). It differs from other organisational theories as it maintains a clear focus on relationships as opposed to the specific attributes of any part of the network (Scott et al., 2008). Once the network map is identified, each individual relationship, or tie, within the network can be analysed. This will help to identify the nature of the relationships along with the drivers behind them in order to explain how the network operates. A type of network theory would appear to be a strong basis for this research given its prominence across the research areas.

2.3.1.5 Summary

Taking these theories and discussions of them into account, whilst some of the others could have been applied to this research, it was surmised that network theory provides a suitable lens through which to ground this study. Where the purpose of the study is to better understand the relationships between individual organisations in the food waste supply chain and considering the scale of the wider network, network analysis provides a variety of ways to provide such insights.

2.3.1.6 Network theory in social enterprise and food waste literature

Whilst network theory has been used extensively in supply chain and waste research, there is little overlap between network theory used in the context of social enterprise and food waste together, which has led to the identification of a gap in the literature. Table 2E includes a demonstration of other research which has taken place within network theory with some relevance to either food waste or social enterprise.

Table 2E: Food waste and social enterprise research in a network context.

Author	**Title**	**Social Enterprise or Food Waste**	**Type of network theory used**
Brady and Haugh, 2011	Social entrepreneurship and networks	Social enterprise	Social network analysis
Kohonen, 2012	Actor-network theory as an approach to social enterprise and social value: a case study of	Social enterprise (finance)	Actor-network theory

	Ghanaian social enterprises		
Hazenberg et al, 2016	The role of institutional and stakeholder networks in shaping social enterprise ecosystems in Europe	Social enterprise	Evolutionary theory
Grainger et al, 2018	The use of systems models to identify food waste drivers	Food waste	Bayesian Networks
Xu et al, 2018	Cross-boundary collaboration in waste management research: A network analysis	Waste management	Cross-boundary research collaboration
Hazenberg et al, 2018	The role of stakeholder networks in shaping the development of social enterprise ecosystems	Social enterprise	Social network theory
Ghinoi et al, 2020	Toward the creation of novel food waste management systems: A network approach	Food waste	Social network analysis
Busch and Barkema, 2022	Align or perish: Social enterprise network orchestration in Sub-Saharan Africa.	Social enterprise (agriculture)	Social network analysis

Table 2E, whilst not exhaustive, demonstrates that there is a gap in the literature in using network theory to study social enterprise in the context of food waste, as other studies tend to focus on social enterprise or waste management more broadly, or in alternative contexts. There is also no research which directly uses Granovetter's theory of Strength of Weak ties, which again gives scope for this research to fill a research gap.

2.3.2 Unpacking network theory

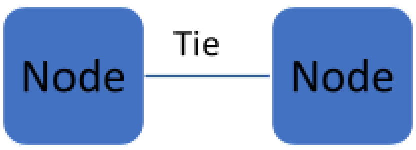
Network theory is an overarching term which encompasses several sub-theories. Some of these will be discussed in section 2.1.2, and an appropriate theory will be selected for use within this research. This theory will then be utilised in this research to assess the networks surrounding food waste and how social enterprises fit within the wider organisational context.

Each part of the network, whether organisation or individual, is commonly referred to across the different network theories as a ‘node’. Scott et al. (2008) identified that where the focus is on the individual, a positivist approach tends to be taken, whereas for relationships, an interpretivist approach is more common. This is because individuals can be studied scientifically, they can be examined, tested, and analysed based on numbers, facts, and social norms; whereas relationships are social constructs where each party may interpret the relationship differently according to their own perception, leading to more subjective viewpoints and a need for in-depth understanding in order to fathom the full picture.

There are many different adaptations of network theory, however, there are some consistencies in terms of defining the language used to describe the components of a network. The ‘nodes’ in a network is a key term to describe the stakeholders involved, and the term ‘ties’ is used to describe the relationships between the nodes (Scott and Carrington, 2011), visualised in Figure 2M below. Ties can be described in a number of ways, for example, directed or undirected, binary or valued (Scott and

Carrington, 2011). Directed ties are where there is a direct exchange, either one way or reciprocal, between two nodes. Undirected ties are between two nodes but where there is no particular direction involved. Binary ties are ties between nodes that either exist or do not exist, whereas valued ties involve some kind of scale or indication of the strength of the tie. These descriptions will aid in the insight into network relationships enabling the provision of an in-depth and detailed understanding of the network. Such descriptions allow for consideration of the relationships from a variety of viewpoints, providing depth and comprehensive information regarding the nature and behaviours within the network.

Figure 2M: Basic elements of a network – nodes and ties.



One differentiation made within network theory is the focus on either whole networks or 'ego' networks. Where egocentric networks focus on only one node and its associated ties, the whole network approach considers the full wider network and all of its associations, ties and indeed the absence of ties (Scott and Carrington, 2011). In the egocentric model, the central node is called the 'ego' whilst all other nodes are referred to as 'alters' (Scott et al., 2008).

Figure 2N: Ego-centric network model.

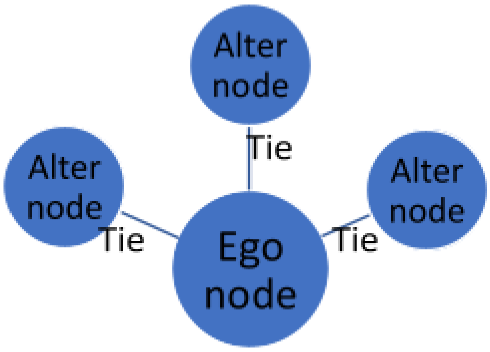
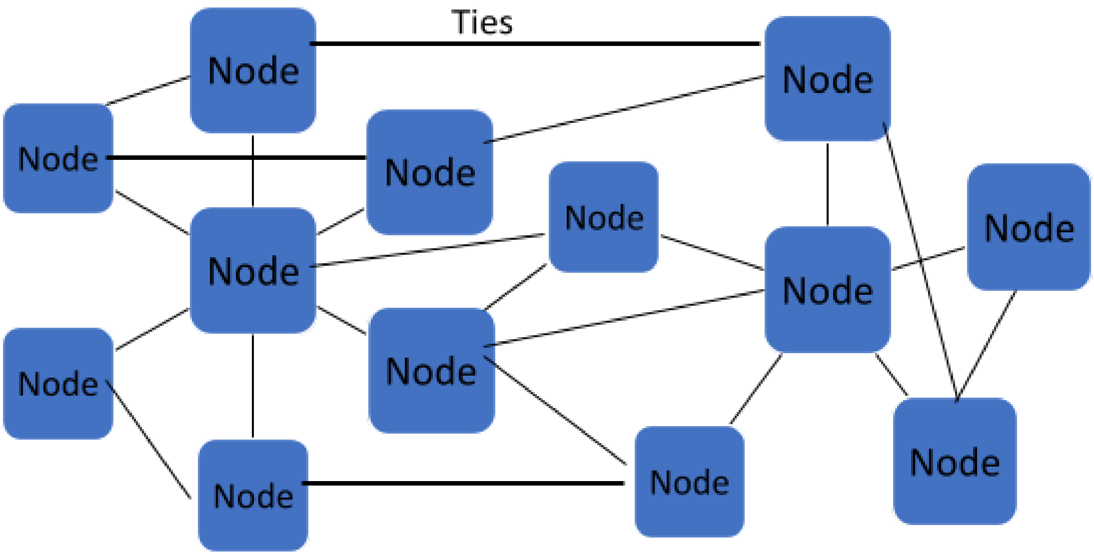


Figure 2O: Whole network model.



Internal ties have also been identified as a further factor to consider within networks (Pavlovich (2003). As such 'portfolios of interconnections' can vary widely between organisations. This is also a useful aspect to consider in analysing a network where multiple people within one organisation have influence within the same network. Network theory can be used to analyse "inter-organisational relationships such as alliances, partnerships, clusters and communities of practice" (Scott et al., 2008). Such networks have been shown to aid in the delivery of a product, and also in overcoming obstacles such as industry fragmentation (Scott et al., 2008). This fragmentation, if present in the food waste network will become apparent as a result of this research, through the methods provided within this chapter.

The networks within and surrounding an organisation are crucial to its success (Tjosvold (1986). Interdependence across the nodes and between actors within a network is inescapable and is fundamental to understanding any organisation and how it operates. The extent of this cruciality stretches to suggest that network interactions and interdependence are actually the basis of all organisations (Tjosvold, 1986).

It is important to consider that the relationships within a network may not necessarily be symmetrical. In any exchange of information or resources, one actor may benefit more than the other. One reason for this could be perceived power – the 'weaker' actor may need to offer more to gain a minor win, whereas a stronger party may start from a better negotiation position and therefore does not need to give as much away to achieve their goals (Compston, 2009).

Networks are highly flexible, adaptable structures, used in a variety of ways to suit the situation. This therefore makes them easily adaptable to evolutionary processes such as the introduction and development of technology, which means that methods of communication and social organisation have changed (Castells, 2010). The development of networks has been assisted by factors such as globalisation and ease of international communication (Scott et al., 2008). The availability of email and video calling technology now means that conversations can be held from opposite sides of the world, significantly opening up a world of new collaborative possibilities. From the perspectives of multiple researchers, enhanced knowledge transfer capabilities lead to more productive relationships (Argote et al., 1990; Cegarra-Navarro, 2005). Castells (2010) takes this further to suggest that technology is the reason behind the rapid expansion of network use across all sectors of activity, as a form of social organisation. It is argued that wealth, power, and knowledge generation are based on a society's ability to embrace new technologies and utilise them effectively.

Outlining some key paradigmatic characteristics of networks can help to epitomise the value of networks (Wellman (1988). These include the ability to discover groups through analysing network relationships, and the identification of structural advantages within networks and the constraints they place on the behaviour of individuals and organisations. Wellman (1988) also demonstrates how networks show the overall structure of multiple relationships in a group and not just a pair, which helps to show who the key stakeholders are and how the whole picture fits together. Network analysis, therefore, provides a means of conceptualising, visualising, and analysing complex sets of relationships, and helps to identify where the 'critical junctures' within a network are (Scott et al., 2008). Critical junctures are defined, for the purpose of this research, as key relationships within the food waste network which control a vital aspect of the process, without which the supply chain would be broken, and the process would fail.

There are some critiques of network theory, such as their denial of underlying social structures and causal processes (Joseph, 2010), the exclusion of cultural and community-driven factors in determining individual and group behaviour (Coward, 2017), and the focus on structure without noting the process of relationship development (O'Donnell et al, 2001). The use of qualitative research will help to address some of these factors as it allows for exploration around the nodes and ties, in addition to simply noting their existence. A further critique is around the static nature of network analysis and its inability to recognise the dynamic nature of relationships, thus only providing a 'snapshot' of a current network (O'Donnell et al, 2001). Whilst these are valid criticisms, this approach remains prominent in research, and remains a suitable theoretical lens for this research, as some of them can be addressed through the research design and others are accepted as shortcomings whilst still providing a useful insight.

2.3.3 Sub-theories of network theory

Network theory is a very broad, overarching theory which encompasses a vast number of theories within it. Different forms of network theory were considered, including the work of several significant theorists - the strength of weak ties theory from Granovetter (1973), Burt's structural holes theory (1992), actor-network theory (Callon, 1986), and policy network theory (Scott et al., 2008). Network theory was also analysed in relation to other theories, such as social capital theory (Lin, 2008), collaboration and trust research (Sridharan, 2013), and communication-based theories (Fulk and Boyd, 1991).

Monge and Contractor (2001) assimilated the different types of communication-based network theories into ten wider categories which identify the broad assumptions of each theory. These categories include theories of self-interest, of mutual and collective interest, and of exchange and dependency, all of which tell a different story about the nature of networks, how they come to exist and how they are maintained. Each of these three broad categories assumes that the driver for such relationships is different – either the self, the collective or the resource. Self-interest theories include social capital theory and transaction cost economics; mutual and collective action theories include social network theory and game theory; and exchange and dependency theories include social exchange theory and resource dependency theory.

An overlap in the literature between network theory, collaboration research and trust research has also been identified (Scott et al., 2008). Kotler (1993) suggested that the combination of knowledge, expertise and resources, which is brought together via relationships in a network, gives an organisation a competitive advantage. These collaborations between nodes in a network are built on trust, which can be legally bound within a contract or moral, but either way, it offers an incentive (Hjalager, 2000). A group of researchers on the subject of Industrial Marketing and Purchasing (IMP) emphasise the interaction approach taken between actors, which builds relationships over time, and its importance in the success of a business. This would align well with research on trust and collaboration as the nature of true collaboration is built around a high level of trust and interdependency. This concept of interdependency goes beyond purely economic drivers, into social informational and technological exchanges which impact the network ties (IMP, 2021).

Trust between parties can also form a grounding which allows for risk-taking behaviour, cooperative action and the development or expansion of social capital between two or more parties (Sztompka, 1999). According to Glover and Hemingway (2005), it is key to note that “social capital is not an individual possession, as are other types of capital, but is instead the collective possession of those who are connected by social ties” (Glover and Hemingway, 2005, p.389).

Lin (2002) discusses network theory in relation to social capital, suggesting that social capital can only be explained as a resource which is embedded within social networks. This perspective is an interesting one, particularly when considering egocentric networks. Taking an example of a central node (the ego) with two strong ties, there are two contrasting arguments for the strength of the social capital within the network. One perspective from Coleman (1988) suggests that social capital is particularly strong if a connection also exists between the two strong ties, as the two can work together to assist the central node. In contrast to this, Burt (1992) suggests that the connection between the strong ties reduces the social capital of the central node as they have less control over the flow of information directed towards one tie or the other, as there is increased likelihood of the two sharing the information between themselves. There are some instances, however, where such interactions can assist the central node. For example, if related social enterprises work together, it could help a commercial organisation or even a government to operate more effectively. Lin (2002) furthers these suggestions by including the impact of characteristics such as social class, wealth, power, and expertise on the development of social capital within the network. The extent of the networks of each tied node can also have an impact on social capital and the flow of information through a network. If a central node has six ties, for instance, but they are not well connected, there is an argument for the amplified strength of a central node with only two ties which are better connected.

Granovetter (1973) studied the value of ties, considering how the weak ties in a social network do not necessarily overlap in the same way as strong ties, and therefore more novel information is potentially available from a weak tie than from a strong one. This will be explained in more detail in the following section. There is some similarity in the structural holes theory (Burt, 1992), although instead of explaining it through the strength of ties, Burt uses a bridging conceptualisation, where the structural hole between two parties is filled with a 'bridge' node which is in a strong position between two (or more) strong networks with the ability to capture information from each. Granovetter's theory would suggest that the strength of this bridging tie would also have an impact on its significance within the network.

2.3.3.1 Granovetter's Strength of Weak Ties theory

The strength of weak ties theory, initially developed by Granovetter in 1973 and then elaborated upon in 1983, is a sociological network analysis theory, which means that it focuses on the analysis and interpretation of networks from a sociological viewpoint. Network theory is a type of sociological theory as it focuses on people and the relationships between them, however, it is frequently used in the context of business and management as so much of business is focused on people and networks. It has been utilised in a number of different research contexts such as the study of communication, innovation, resource distribution, organisation, and structure. This particular form of network theory aims to provide a link between macro and micro levels of sociological theory, using the strength of ties within interpersonal networks to emphasise the importance and power of weak ties, particularly with regard to relations between core groups rather than within them. Therefore, as the focus of this study is in the context of networks surrounding food waste, it can be used to examine the relationships between network nodes to identify whether they have strong or weak ties, and how this affects the operation of the network. This notion of “strong” and “weak” ties is discussed within the original theory paper and has been discussed extensively since (Jack, 2005; Kirkland, 2011; Takahashi and Inamizu, 2014; Sundararajan, 2020; Kramer et al, 2021; McMillan, 2022).
Granovetter identifies four factors which combine to form classifications of whether a tie is classified as strong or weak – namely “the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services” (Granovetter, 1983) which characterise the relationship. Whilst these terms are not operationalised in the original paper, much work has been done since to establish how such factors can be measured. “Granovetter argued that a tie’s strength would be a combination

of the amount of time two actors spent together; the emotional intensity of their relationship; the level of intimacy and/or mutual confiding between two actors; and the amount of reciprocal services or favours" (Prell, 2012, p.138), which demonstrates a level of multiplexity where the values of each need to be combined, as actors are measured across the four dimensions.

Further research has led to efforts to operationalise Granovetter's theory (Marsden and Campbell, 1984; Friedkin, 1990; Mathews et al, 1998). The four factors – time, emotional intensity, intimacy, and reciprocity – are terms which have been measured in many different ways across the body of related empirical research. Each one will be taken individually and reviewed according to the literature, although some studies overlap multiple factors. As Granovetter's theory encompasses all four, it would seem logical that much of the literature takes more than one factor into account. Decisions will be made in relation to this research on how best to operationalise them within the context of food waste reduction networks and government policy.

2.3.3.1.1 Time

The 'amount of time' factor is, of all four factors, the most straightforward to measure. The difficulty comes in interpreting how much time within a given time frame constitutes a strong or a weak tie between two nodes, or whether it should be interpreted as relative to other ties. Measures of time range from simply asking how many minutes or hours are spent on average over a week or a month, to more general choices such as regularly, often, occasionally, or rarely. The latter approach would be much more open to individual interpretation of the words than the former, which would need to be taken into account and acknowledged should this approach be taken.

One approach taken by Nelson (1989) identified that time and reciprocity were almost interchangeable, yielding overwhelmingly similar results. This research was focused on contact between individuals within the same organisation – a strong tie was defined as contact made six or more times in an average week, whereas a weak tie was one to five times per week. The reasoning behind this was that the average of once per day contact suggested the ability for reciprocity and friendship to be developed. Shi et al (2009) highlight the need to adapt any measurement scales to suit the specifics of the study and the setting within which it takes place, which seems a reasonable observation given the complexities of networks and the relationships within them. How each individual network operates may not be the same as another in terms of the amount of time spent, and the parameters, such as six days a week to be labelled a strong tie, would be vastly different depending on the wider context. Therefore, an absolute measure of tie strength based on the amount of time is not possible to create, and it can be concluded that a relative approach should be taken to analysis based on the responses of the participants. Using this approach, the assumption is that strong ties are identified as those which have more frequent contact (Marsden and Campbell, 1984).

There is some difficulty in using time as a numerical measure as it fails to acknowledge the nature of the time spent, and what occurs within the interactions.

Utilising some alternative network theory instruments to help explain the nature of the time (see section 2.1.3), combined with the measures of the amount of time, may produce more meaningful conclusions as it helps to establish the motivations and drivers behind the amount of time stated, along with the other factors from Granovetter's theory. Prell (2012) supports this notion, suggesting that - "only measuring the frequency of communication between actors is not enough of an indicator for measuring the strength of tie" (p.76).

Jack (2005) suggests that frequency of communication is actually less important than the ability for each tie to remain intact *despite* infrequent contact. Instead, it is suggested that the focus should be on respect, familiarity, and trust between the two individuals. Marsden and Campbell (1984) suggest similarly that there are issues with using time spent together as a measure of strength, instead preferring emotional intensity as a measure. However, it is observed by Stanko et al (2007) that time is an important measure in order to build trust between nodes.

Despite these difficulties, using time provides a straightforward measurement which can be combined with other factors to portray a more comprehensive picture of the relationship. On this basis, time alone would then not be a determining factor of tie strength, but instead, a combination of all factors would. Therefore, even if the time is infrequent, it would not prevent the relationship from being classified as strong if all or most of the other factors were scored highly, although it does still contribute to the overall score.

PROPOSITION 1: The more time spent together (both frequency and duration), the stronger the tie.

MEASUREMENT: Although there is no way to determine this as an absolute figure, questions will be asked about how much time in a given week or month is spent with the other node, both frequency and duration. This, when compared alongside other answers, will help to determine an appropriate method for assessing the responses.

2.3.3.1.2 Emotional intensity

Emotional intensity is described as the “degree to which partners have feelings for each other beyond the economic transaction” (Stanko et al, 2007). Honesty, trust and fairness have been highlighted as key foundational aspects of developing emotional social attachments between organisations (Gilliland and Bello, 2002).

Marsden and Campbell (1984) identify emotional intensity as the “best” indicator of the strength of a tie as it is not ‘contaminated’ by other factors which may influence the data. It is also referred to as ‘closeness’ by the three studies examined within the paper, and each uses only a simple three-option indication in which participants are asked to identify their tied nodes as either an acquaintance, a good friend or a very close friend. In a study of ties using social networking sites, emotional intensity was again found to be the strongest determining factor in the strength of relationships (Luarn and Chiu, 2015).

This is supported by Stanko et al. (2007), who found a particularly strong relationship between emotional intensity and commitment, in a study which also found positive relationships between reciprocity and mutual confiding. They suggest that emotional intensity is the strongest of the three. Whilst the study generally focuses on organisational relationships, there is emphasis placed on the importance of the personal relationships within the organisations and how emotionally involved the individuals are. They highlight that whilst the other factors are behavioural, emotional intensity is an affective dimension which means that comparisons can be drawn between behavioural dimensions and emotion. In order to determine this, three questions were asked, with answers given on a seven-point Likert scale of agreement, from strongly disagree to strongly agree. They related to feelings if the organisational relationship were to end, excitement regarding the products and interactions within the relationship, and the meaning of the relationship beyond the transactional aspects. The results showed that emotional intensity was a strong and significant factor in driving commitment between firms.

A further factor which supports the use of time as a factor alongside emotional intensity, is the suggestion that frequency of communication has an impact on the emotional intensity of a relationship at any given point. Roberts and Dunbar (2011) demonstrate a direct link between the two, suggesting that there could be a causal relationship between the factors. Their methodology used a single scale of 1-10, asking participants to rate their level of emotional closeness with the individuals within their network. Whilst participants may be asked to rate certain aspects of the relationships as part of this study, similarly with time, this research aims to better understand the context of these relationships and ratings, thus taking a qualitative approach.

The consensus on emotional intensity is that it significantly impacts a relationship's strength, perhaps more so than other measures. The suggestion that time and emotional intensity are linked may be considered during the analysis of the data. Going into the research, they are being studied as independent factors which will then be amalgamated. High scores on emotional intensity indicate a strong tie between the nodes. Where emotional intensity is high, the tie is likely always to be strong regardless of the other factors (although analysing the other factors should prove this point).

PROPOSITION 2: The higher the emotional intensity score, the stronger the tie.

MEASUREMENT: Interview questions around trust and honesty will help to provide the context, which will be backed by Likert-scale questions focusing on the measurement of trust. This factor was chosen as it is key in organisational relationships, which can be applied directly to this research.

2.3.3.1.3 Intimacy and mutual confiding

Intimacy relates to the breadth of topics discussed by the nodes in the tie, and the extent of mutual confiding (Marsden and Campbell, 1984). High scores were given in their study to those who mutually shared personal problems, family details and political attitudes as opposed to more general conversation around work or leisure activities which were the most commonly cited topics of conversation. Mutual confiding in inter-firm relationships refers to the level of bi-directional information exchange, and also to the quality of such information (Stanko et al., 2007). This starts with effective communication in order to understand each other's goals and styles of working, leading to shared understanding and greater coordination between parties. As a result, this evolves into the sharing of confidential, detailed information which helps with joint problem-solving, creativity and efficiency (Stanko et al, 2007).

Intimacy is often discussed in relation to personal networks using measures such as whether they had visited each other's homes (Huszti et al, 2013) which may not be applicable in this scenario of organisational relationships. Another one, however, was the discussion of personal issues, which is synonymous with the studies already discussed. This seems to be a core component of discussion around intimacy and mutual confiding, but is again not particularly relevant to organisational relationships - they do not need to be personal to be effective.

Mutual confiding (or intimacy) is a rather subjective measure, open to interpretation (Krackhardt et al, 2003). This makes it difficult to design research instruments to measure it adequately, and may need a more inductive approach in order to understand the nuances of the relationship in this way. This is similarly the case with emotional intensity - there is not an easy number which can be placed on it which is entirely objective.

For this study, Stanko et al's (2007) definition of information exchange is likely to be the most relevant, particularly in terms of data or information which could be considered confidential. As mentioned above, where there is an interpretive aspect of this factor, the sharing of confidential information can be seen as a method of confiding at an organisational level, demonstrating a level of intimacy between the firms in their trust for one another. In the case of organisational relationships, it is not necessarily the case that individuals are required to share personal information or issues with one another in order to establish a strong and effective network.

PROPOSITION 3: The higher the score for mutual confiding, the stronger the tie.

MEASUREMENT: The exchange of confidential information will be measured on a scale, where one side is nothing at all and the other is where they are willing to share confidential data with the other party. This will be measured from both perspectives.

2.3.3.1.4 Reciprocal services

The notion of reciprocity starts with the assumption that both nodes acknowledge that the tie is a strong one in order for it to be labelled as such (Friedkin, 1980). It refers to the willingness of both parties to do things for each other (Stanko et al, 2007) which leads to increased value placed on the relationship from both parties. The formation of a joint strategy where both parties contribute to the goals is both a basis and a result of such reciprocity. Granovetter (1985) when the theory was revisited, highlighted that "although strong ties may not generate new information, they tend to be more useful than weak ties” due to the reciprocal exchange of information between network actors.

Friedkin (1980) uses a scoring system to measure reciprocity, in which factors are rated based on a simple scoring chart based on facts about the tie which both nodes confirm individually. Six measures are used and are rated zero (neither party agrees), one (one party agrees) or two (both parties agree), the 0-12 scale would conclude a score of zero for no contact or knowledge of each other, twelve for reciprocated mutual relationships across all six measures. This model uses factual statements to establish whether a tie exists between co-workers, but it could be adapted well to suit this research using statements which relate to this kind of relationship. Further to this research, ten years later Friedkin (1990) revisits Granovetter’s theory, highlighting reciprocity as a key factor in tie strength.

Molm (2010) suggests that reciprocity can lead to other positive outcomes for organisations, making it a key part of building relationships. These benefits include “reduced transaction costs, greater knowledge sharing, facilitated decision-making, and forms of assistance that would otherwise not occur”. These points could prove helpful in food waste management and in the supply chain should reciprocity be prevalent in these ties. The importance of reciprocity is supported by Pervan et al (2011), who highlight it as “an important norm of behaviour in strong relationships”.

In summary, reciprocity has been studied extensively both as part of Granovetter’s theory and independently of it. It is apparent that many advocate for the importance of reciprocity in strong relationships, and so support Granovetter's theory that it is one of the four key factors in strong ties.

PROPOSITION 4: The higher the score on the reciprocity scale, the stronger the tie.

MEASUREMENT: An understanding of reciprocity between actors, whether they both feel that they benefit from the relationship in some way, will be a good indication of this factor. Measurement of how much would also be helpful, not only do they both benefit, but whether this is equal or weighted in one direction or the other.

2.3.3.1.5 Critique of Granovetter's theory

Whilst there is general support for the use of Granovetter's theory, it is clear that some of the four factors are valued more than others, and some are easier to measure than others. The combination of all four proves to be a challenge to understand and interpret. Jack (2005) observed during the data collection process that interviews would not be sufficient to produce the depth of data required and therefore adopted a combined approach with ethnographies to further explore the relationships within the networks. This highlights the complexity of the relationships and how difficult they are to measure.

In contradiction to this, Mathews et al (1998) conducted a study on tie strength using 13 measures which were ranked on a scale, which incorporated all four factors. Individuals were asked to rank their relationships on a scale of one to five on each of the measures, including hours spent together per week (time), closeness (emotional intensity), how often each person asks or is asked for advice (reciprocity), and discussion of personal issues (intimacy/mutual confiding) between the two. However, this early research does not take into account the complexities and variety of relationships, and therefore it seems appropriate to take a balance of both approaches.

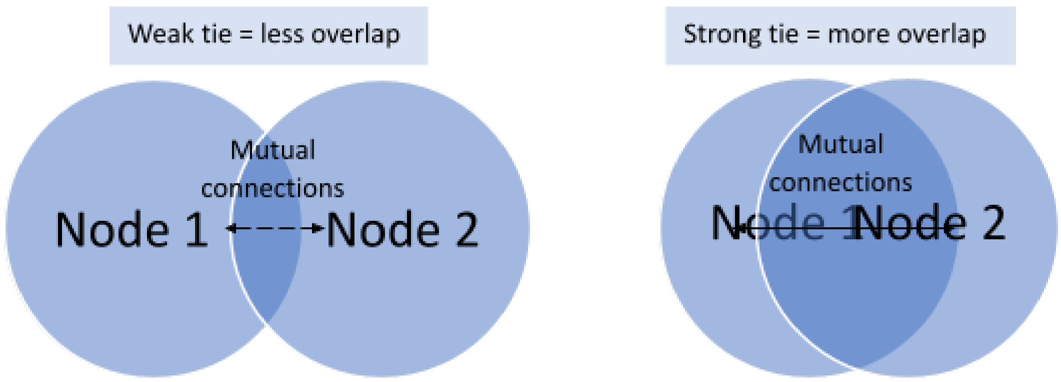
There is still little precedent for how strong and weak ties are measured, with Krackhardt et al (2003) highlighting this ambiguity. It is observed that even if we could measure each of the four factors, the question remains of at what point the tie becomes weak rather than strong - and what benchmarks should be achieved in order to label them as such.

It seems important to also note the dynamic nature of relationships, and how they change over time. It is the case, then, that in the absence of a longitudinal study, this research will be a snapshot of the current situation. This provides scope for further research to observe the changing nature of the network over a period of time.

2.3.3.2.6 Key concepts and applications of the theory

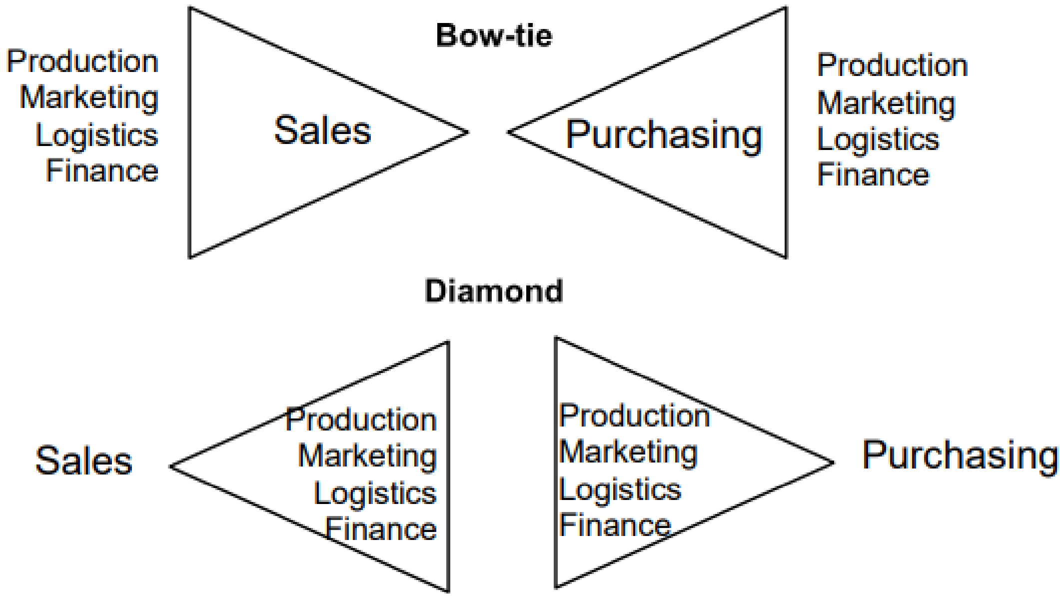
As the theory focuses heavily on the linkage between groups as opposed to within them, a key concept of the original theory focuses on the ‘overlap’ between networks and the smaller circles within them. This suggests that the degree of overlap, in other words, the proportion of mutual connections, is directly correlated with the strength of the tie. To put it simply, where a strong tie exists between two individuals, two organisations or two groups, the network connections which exist for each of the two nodes of the given tie would be highly likely to share large similarities. A weak tie between two nodes, however, would likely share very few connections. This is visualised below in Figure 2P.

Figure 2P: Degree of overlap for strong and weak ties.



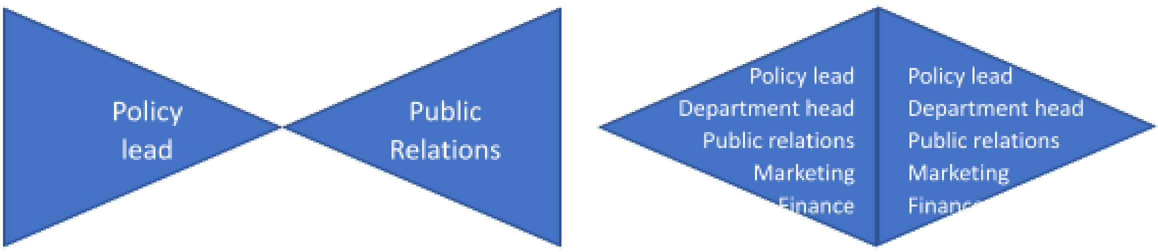
An alternative way of looking at such relationships is the bow-tie vs diamond model. This model visualises the difference between organisations where a single relationship exists between two organisations, and where multiple relationships exist between the same two organisations. An example of this would be where a sales department and a purchasing department have a relationship (bow-tie), versus multiple relationships across departments such as marketing, production, and finance (diamond). This is visualised in Figure 2Q.

Figure 2Q: Bow-tie vs diamond relationships. (Martin, 1997, cited in Humphries and Wilding, 2001).



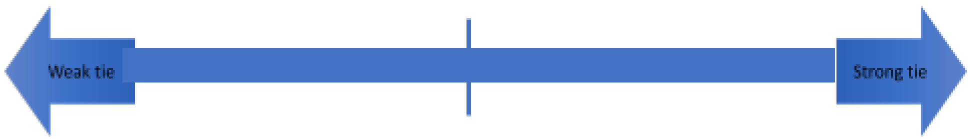
It is suggested that the adoption of the diamond approach leads to improved communication and is necessary for open, honest, and effective partnerships (Humphries and Wilding, 2001). It represents the difference between a transaction-based interaction and a developed relationship-based interaction or partnership (Christopher and Juttner, 2000). Adopting the diamond approach can occur organically in situations where interaction levels get higher as different departments become closer to their counterpart in the other organisation (Backstrand, 2006), or can be a conscious choice (Cooper et al, 1997; Kouilkoff-Souviron and Harrison, 2006). In the bow-tie model, the tie is easy to break if a competitor simply offers something more appealing, such as a better price. This model often involves a "filter" type of role such as a sales manager or account manager who is solely responsible for maintaining the relationship (Cooper et al, 1997; Cook et al, 2001). This relationship, in Granovetter's terms, would be the 'bridge' tie between the two organisations. In the diamond model, the tie would be much stronger as the multiple relationships between the organisations represent a more integrated approach to working together towards "mutually agreed goals" (Christopher and Juttner, 2000, p.19), although can also be more costly in terms of time commitment (Kouilkoff-Souviron and Harrison, 2006). This also leads to a change in the content of the interaction (Backstrand, 2006). These multiple mutual connections support Granovetter's theory that greater tie strength equals more mutual connections. Considering this in the context of weak ties, it also supports the theory that these ties would be more likely to share any weak ties with each other.

Figure 2R: Diagram showing how this may apply to relationships between governments and social enterprises.



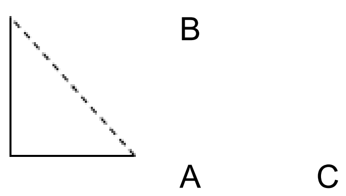
The bow-tie and diamond approach represents an either-or situation with regard to relationships, however, it could also be demonstrated as a continuum (McAfee et al, 2002). At one end, the bow-tie – short-term, transactional tie, and at the other the diamond – the long-term integrated strategic partnership. It is often the case that whilst such ties fall more suitably into one category or the other, there is a middle ground which represents the complexities of organisational relationships. The factors which determine such a continuum are similar to those identified by Granovetter in determining strong and weak ties. They are categorised into the 'content' and the ‘mode’ of interactions. The ‘mode’ of communication includes frequency and richness of communication – comparative to Granovetter’s time and intimacy factors, and the ‘content’ of communication covers initiation of communication, disclosure of information and influence – comparative to reciprocity and emotional intensity. This includes tangible examples such as a joint approach to planning, shared benefits and risks, and dyadic information exchange (McAfee et al, 2002). The continuum approach (Figure 2S) may therefore also help to determine the strength of the ties between organisations. A divide in the centre of the continuum may be appropriate to decide whether a tie is classified in Granovetter’s terms as strong or weak based on an amalgamation of the factors involved.

Figure 2S: Continuum of tie strength.



As a direct result of such overlaps, Granovetter purports that the diffusion of information to a wide audience is more effective where a network exists with many weak ties, as it is more likely to reach a wider range of people than in the case of a network with many strong ties, where there is more likely to be a greater overlap of contacts within the network. The higher number of weak ties, where there is less overlap between contacts means that there is more scope for the information to be passed further. Most networks are made up of a combination of the two. As the weak ties in a social network do not necessarily overlap in the same way as strong ties, more novel information is potentially available from a weak tie than from a strong one. It could be said that as a result of this, those nodes with a smaller number of weak ties may struggle to retrieve information from other parts of the network. This is due to the fact that the two nodes in a strong tie are more likely to share a high number of mutual connections and the information is likely to circulate within the same networks repeatedly. In the case of many weak ties, information is likely to be shared with fewer mutual connections and hence a higher number of non-mutual connections. Weak ties are therefore operating, at times, as a 'bridge' between two groups.

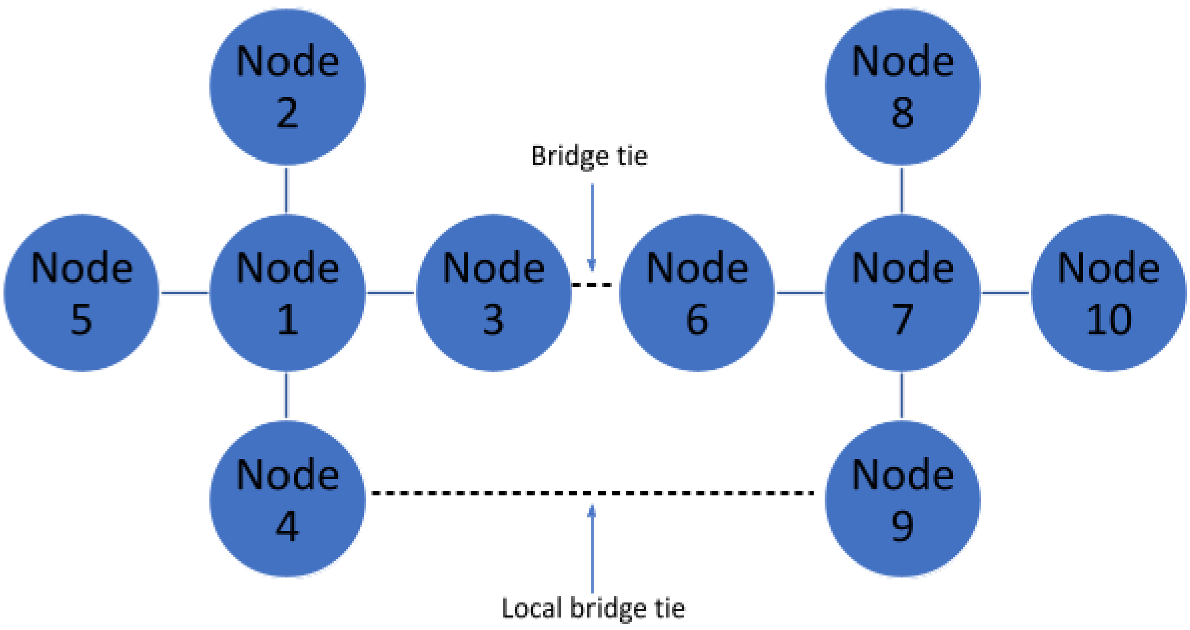
A 'bridge' connection is identified as a tie which provides the only link between two points within the network. According to Granovetter, bridge ties are (almost) always weak ties. This is owing to the idea that any strong tie which exists between two nodes is likely to lead to a high number of mutual connections. Weak ties, on the other hand, are more likely to link different groups together. Granovetter posits that where a strong tie exists between two nodes (for example, A and B), and another exists between the first and a third node (A and C), it would be virtually impossible for there to be no tie at all between the second and third nodes (B and C).



This triangular model which shows two strong ties (A-B and A-C) demonstrates why a strong tie cannot be a bridge, unless one node has no other strong ties at all. This is because any combination of two strong ties tends to create a tie, which can be strong or weak, between the nodes which were previously unconnected, therefore creating an alternative path.

A tie could also be described as a ‘bridge’ if it creates a much more direct path between two nodes. These are known as ‘local bridge’ ties as they create a more efficient path between two local nodes which may otherwise be connected in a longer, more convoluted way. Bridge ties are visualised below in Figure 2T.

Figure 2T: Bridge ties and local bridge ties.



Local bridge ties are useful, as Granovetter states, as there is a point where the length of the path between two nodes becomes infeasible for effective communication. The theory refers to the length of the path by means of ‘degrees’ - or the number of connections between two nodes. For example, using Figure 2V above, without the local bridge tie between nodes 4 and 9, in order for them to interact they would need to go through nodes 1, 3, 6 and 7 – a ‘degree’ of five, one for each tie between the nodes. This is much less efficient and less likely to happen if the tie between the two of them did not exist. Similarly, to get from node 5 to node 9, to avoid the same path of nodes 1, 3, 6, 7, 9, the more efficient path is 1, 4, 9 with the bridge tie in place, reducing the degree from five to three. Weak ties are proposed to be significant in this context as the local bridge ties create more and shorter paths between the nodes in a network, likely leading to a greater chance of effective communication.

With this in mind, it is likely that the removal of any weak tie would likely have a much greater effect of the diffusion of information than a strong one, because it could remove one of these bridges making it more difficult for information to be circulated. This leads to the assumption that the diffusion of information through weak ties can be more effective in reaching a wider range of people. It can then be surmised that if a node has very few weak ties, or ‘indirect’ contacts as a direct result of such bridging ties, they are much less likely to receive information or knowledge from beyond their immediate circle of contacts. This can be problematic when trying to distribute information. From a macroscopic viewpoint, a network containing few weak ties could arguably lead to fragmentation. Considering this in the context of food waste networks, maintaining weak ties is important to ensure that key stakeholders are informed and engaged in the development and implementation of the network, especially if it has an impact on them or their work. These stakeholders could be internal to the supermarket or external to it, such as key charities, social enterprises, NGOs, governments and businesses.

In summary, the greater the number of weak ties within a food waste network, the further that information regarding any initiatives can spread. The number of weak ties within the network map will therefore be higher where the engagement levels from retailers with food waste reduction social enterprises are higher.

PROPOSITION 5: More weak ties present in a network lead to more widespread success in the reduction of food surplus.

MEASUREMENT: This will be measured using the four metrics identified by Granovetter to identify the weak ties and map out the network. Social enterprises and supermarkets will be asked about the different organisations they work with to triangulate with this information.

Networking and collaboration play an important part in food waste reduction, to avoid the potential for fragmentation in approach. Granovetter's theory has been utilised in similar organisational research, and is an area which has potential for further development. At its core, the analysis of strong and weak ties could play a significant role in understanding the effectiveness of food waste networks, something which this research could begin to contribute to.

The key notion of this theory, that strong ties between two nodes would create a significantly increased likelihood of other shared connections, will be explored within this research, specifically in relation to the supply chain networks surrounding food waste. Particular interest will be paid to those surrounding the supermarkets, governments and social enterprises.

Granovetter (1973) also considers how new innovations become popular using this theory. It is suggested that there is a key difference in how innovations are initially adopted, based on how controversial it is. A central node with many strong ties is much more likely to adopt an innovation if there is a total lack of controversy involved as they are keen to protect their reputation. In contrast, a more marginal node may be more likely to adopt something with the potential to be of a higher risk. In these cases, for a new, more risky innovation to become popular, a node with many weak ties is likely to be more successful as some of those ties are likely to be bridges, and a wider range of people can be reached. The number of early adopters is important in order to cause a 'chain reaction' and spread the innovation as far as possible. Chubin (1976) supports this, taking it a step further to claim that central nodes can be 'shackled' by their own vested interests and their own perspectives, meaning that the more marginal nodes often take on the role of innovation. Within this research, this could be significant, as the role of fostering innovation is often taken on by social enterprises (Chell et al., 2010). As a result of this, it would be expected that social enterprises operate as the marginal nodes within the network, and their success would therefore be dependent on the volume of weak ties within their networks. However, Rost (2011) provides an alternative viewpoint to this, suggesting that although the marginal nodes may start a new innovation, they must rely on their strong ties, and leverage these relationships for the innovation to become established. Social enterprises therefore rely on a combination of their strong and weak ties to successfully introduce their innovations surrounding food waste reduction.

PROPOSITION 7: Social enterprises rely on both strong and weak ties for their success.
MEASUREMENT: The network map, using the four factors identified by Granovetter, will show the strength of the ties from the social enterprise. A better understanding of the nature of these relationships, which will be assessed during the interviews, will reveal how they utilise their ties to introduce innovation.

Communities can also be considered in line with Granovetter's theory. The theory includes the notion that for a community to organise itself most effectively, weak bridging ties must exist in order for people to work in collaboration with each other rather than in self-contained smaller groups. This can be directly applied to the networks surrounding food waste, as this research intends to demonstrate how such networks operate, and identify where the strong and weak ties lie within it. This should then highlight where collaboration occurs and where it is most effective. For such collaboration to happen, whether in communities or in government, it is clear that opportunities must be available for ties to develop, in several clear and distinct ways to allow for the development of both strong and weak ties. This could include government-based meetings, business networking, supplier relationship building, and public focus groups, to give a few examples. The idea of reciprocity is also mentioned as part of Granovetter's follow-up article (1983), which will be looked at in more detail throughout this research, alongside the other three factors discussed above.

PROPOSITION 8: Bridging ties will exist within food waste networks to facilitate food surplus management.

MEASUREMENT: Development and analysis of the network map and further assessment during the interviews, including a question on how the ties came into existence.

The authority of a leader and their impact is discussed within the original theory. This is particularly relevant to policy-making and government-led initiatives, as an effective working relationship must be established between the government, who are often leading the initiative, and key stakeholders. This could also be relevant to supermarkets and their agreements which occur at a national level. Leadership is interesting in relation to reciprocity, as it could give an indication of where the power lies in the relationships. Granovetter theorises that trust is a core component of such relationships, which will be used as part of the measurement for the emotional intensity factor, suggesting that the more individuals who can recommend or provide personal assurances regarding the leader, the greater the levels of trust involved. Given the significant complexities surrounding trust research, this research will not seek to contribute to the literature on trust but acknowledges its role in relationship development. Thus, for a leader, creating many weak ties across stakeholder communities allows for these recommendations and assurances to happen. The result of this is greater trust and, therefore, greater authority and impact. This then leads to productive collaboration on policies and a greater chance of implementation in a way which positively impacts all stakeholders.

Transitivity relates to the preferential influence that a node has over other nodes (Holland and Leinhardt, 1971). Granovetter asserts that the strength of the ties involved impacts the level of this influence – strong ties lead to greater levels of influence. In contrast, weak ties lead to much lower levels within a particular relationship. The focus on weak ties within the theory means that whilst influence is still possible, the likelihood of transitivity between weak ties is low – it is unlikely that nodes who share a weak tie will display preferential behaviour toward one another. Hoang and Antoncic (2003) support the idea that transitivity is evident across strong ties, suggesting that the social connections between the nodes of a network would likely influence the behaviours and actions of others. Whilst such relationships can shape organisations positively, they can also constrain organisational performance (Scott et al, 2008) as a result of certain agreements and mutual values which must be upheld in order to maintain a strong relationship. This could further support Granovetter's theory that weak ties are key to a network's success, as such constraints may not be as prevalent.

Whilst Granovetter (1973) acknowledges the importance of strong ties alongside weak ties in a network, it is clear that the theory prioritises weak ties over strong ones. Elsewhere, Weimann (1980) and Hoang and Antoncic (2003) believe that, generally, wide networks with a combination of strong and weak ties lead to greater success than a focus on just one or the other. Weimann (1980) argues that factors such as credibility and influence are greater amongst strong ties, and that whilst weak ties may provide the bridges between social groups, any decisions are taken within the smaller groups themselves, independently of the bridge ties.

Granovetter (1973), throughout the theory, stresses the importance of weak ties to the success of a node. This is framed in terms of diffusion of information, opportunities, and successful leadership, amongst other factors. These three, in particular, offer a useful framework within which to research the networks surrounding governments and social enterprises and the resulting policy development in the context of food waste.

It is perhaps the case that governments have different motivations for participating in such networks than social enterprises do, which may also differ from supermarkets, something this research aims to address. It will also be useful to question how these networks are formed. They could be more formally established with conscious purpose, or they may emerge more naturally – this will also be explored alongside the nature and strength of the relationship as it may be the case that there is a correlation between how these relationships were formed and whether they constitute strong or weak ties within the network.

PROPOSITION 11: Motivations will be primarily economic for supermarkets and primarily social for social enterprises and governments.

MEASUREMENT: Assessment during the interviews, including questions on how and why the ties came into existence and their goals.

With reference to the above, the next chapter will take this information about food waste, social enterprises, and network theory, and develop a research design and methodology which will aim to answer the research questions. The research questions are introduced at the beginning of the next chapter based on these insights from the literature.

3.0 METHODOLOGY

3.1 Research questions

As previously identified, the review of the literature on the subject of social enterprises in the context of food waste has assisted in the development of potential research areas. It enabled a thorough understanding of the current literature and where there may be gaps which this research could contribute to. In consideration of these potential research areas and how such areas could combine and interact, this research will seek to answer the following overarching question:

> *"How do UK-based supermarkets utilise their network ties with social enterprises and government contacts to effectively reduce their food waste within the supply chain?"*

Within this question, a set of subsidiary questions were identified in order to ensure focus and clarity throughout the data collection process, each one contributing to answering the main overarching research question above. These questions were developed following the review of existing literature and refined as a result of developing the model to be used during data collection (see section 3.4.4). They encompass the results of the literature review, the theoretical background and the theoretical model, as shown in section 3.2.

7. Are UK supermarkets' food surplus networks comprised of **both strong and weak ties** with social enterprises, governments and other supporting organisations?
8. How do the strong and weak ties within the network effectively enable social enterprises to assist in managing supermarket food surplus, and how does this align with the **food waste hierarchy**?
9. Do **social enterprises** form a key component of UK supermarkets' food surplus networks?
10. Are there any key **facilitating factors** to support the effectiveness of managing food surplus, and do they differ between strong and weak ties?
11. Are there any **barriers** to the effectiveness of managing food surplus, and do they differ between strong and weak ties?
12. What are the key **motivations** of food waste reduction stakeholders to partake in the network?

In this chapter the theoretical and philosophical perspectives and research methodologies to be used in looking to answer these questions will be identified. Consideration will be given to multiple possibilities on how to conduct the research, and conclusions will be drawn based on how best to answer the research questions, with full justification. A series of models and instruments will be developed in line with relevant theoretical and philosophical perspectives. These will assist in visualising the research and will be used during data collection and analysis.

3.2 Explaining the research questions

Research questions should be broad enough to be interesting yet specific and narrow enough to remain answerable (Mackey and Gass, 2015). The purpose of research questions is to guide the research process and help the researcher focus their investigation on specific aspects of the research problem (Creswell, 2014). These research questions address a current and globally significant topic, in light of a specific theory in order to keep it relevant to the academic literature and also to maintain a potential practical application. They will be used to provide direction and structure to the study.

Research questions help to clarify the scope of the research, identify key variables, and provide a basis for selecting appropriate research methods and data collection techniques. The questions identified will be core to the development of the research instruments to be used for data collection to ensure that the responses will yield the data needed to address the questions. In addition, research questions help to define the criteria for evaluating the success of the research project (Creswell, 2014). By identifying specific outcomes or measures of success, researchers can assess the extent to which they have achieved their research objectives.

They also help to ensure that the research is relevant and meaningful by addressing specific gaps in knowledge or practical problems (Bartunek et al, 2006). Despite a large body of research existing in the field of food waste and also in the field of social enterprise, there is much less research which combines the two. This presents an opportunity to consider the two together, and in order to start to understand how they relate to each other, a wider look at the network within which they are situated will help to contextualise the research. As demonstrated in the literature review (see chapter 2.2), many studies on social enterprise focus on the care and education sectors, so using a different context such as food waste, where many social enterprises exist, but research is more limited, broadens this field of research and adds another dimension to the literature.

In addition, combining this with Granovetter’s strength of weak ties theory, which is a type of network theory, allows for a deeper assessment of the network and how the relationships within it affect the outcomes for the organisation. This is a gap in the literature which can provide some interesting insights from an alternative perspective. It provides an opportunity for a theoretical contribution to the literature, as it can test the theory from a social enterprise and supermarket perspective, using a network which aims to address a significant social issue.

3.3 Philosophy in social science

Philosophical paradigms can help to explore how one views the world, and from what perspective a certain view or piece of research comes from. This helps to provide a greater understanding of the individual’s approach to studying a phenomenon, based on their view of what constitutes reality and how said reality can be understood through the generation of knowledge.

Ontology refers to the study of the nature of existence or reality. It is concerned with questions about what exists, what entities are in the world, and how they relate to each other (Guba and Lincoln, 1994; Goertz and Mahoney, 2012). In the context of research, ontology is about understanding the nature of the phenomenon being studied and how it exists in the world. It is the foundation of research, as it shapes the questions that researchers ask, the methods they use to study the phenomenon, and the conclusions they draw from their research (Slevitch, 2011).

Epistemology, on the other hand, refers to the study of knowledge and how we come to know things (Guba and Lincoln; 1994; Goertz and Mahoney, 2012). It is concerned with questions about how we acquire knowledge, what counts as knowledge, and how we can validate our knowledge claims. In the context of research, epistemology is about understanding how we can know about the phenomenon being studied, how we can gather data and information about it, and how we can validate our findings (Slevitch, 2011).

Ontology and epistemology are important in research because they help researchers clarify and articulate their underlying assumptions, beliefs, and perspectives, which in turn shape the research questions, design, and interpretation of findings (Guba and Lincoln, 1994). They also guide the research process by helping researchers to select appropriate research methods, data collection techniques, and data analysis strategies. Different ontological and epistemological perspectives require distinct research approaches, and it is important for researchers to choose the methods and techniques that are most appropriate for their research questions and theoretical framework (Grix, 2018). This ensures consistency in the research and will likely lead to more robust, valid and reliable results.

This differentiation is important in understanding a person's approach to research. Combined, the ontology and epistemology, that is, what is deemed real and what is deemed true, of a researcher sets out the paradigm within which the research is carried out.

3.3.1 Philosophical paradigms

The two main philosophical paradigms are positivism and interpretivism. Positivism suggests that everything is real and can therefore be measured and tested definitively, and is focused on testing scientific hypotheses through experimentation and observation. Interpretivism, conversely, believes that reality is socially constructed and is focused on subjective in-depth understanding to provide an interpretation of phenomena in order to determine deeper meaning (Kivunja and Kuyini, 2017). Interpretivism is sometimes also referred to as constructivism (Bogdan and Biklen, 1997). Both paradigms will be discussed further in the contexts of ontology and epistemology, and a viewpoint for this research will be discussed, identified, and justified.

Ontology, according to Kivunja and Kuyini (2017, p.27), is defined as "the philosophical study of the nature of existence or reality", and this assumption is "crucial to understanding how you make meaning of the data you gather" (p.27).

Ontology is focused on an individual's viewpoint on whether a phenomenon exists in itself, or whether it is socially constructed. This would then imply that multiple socially constructed realities can exist within the same context.

The ontological spectrum places objectivity and subjectivity on opposite ends (Goertz and Mahoney, 2012). Conceptually, positivism suggests that everything is real and measurable, ontology is objectively concerned with one reality. Interpretivism, however, takes a more subjective approach, where individual experience creates a unique reality based on a person's own views and experiences of the world. This is perhaps a simplified version of the true picture, which over time has become much more nuanced. Individual researchers may not align with only one or the other viewpoint, but instead, perhaps on a spectrum, where more complex thoughts and ideas can be represented between the two opposites.

Epistemology is not concerned with the nature of reality but with the nature of knowledge. "In research, epistemology is used to describe how we come to know something; how we know the truth or reality" (Kivunja and Kuyini, 2017, p.27).

Kelliher (2005, p.123) summarises that "by its nature, interpretivism promotes the value of qualitative research in the pursuit of knowledge" (Kaplan and Maxwell, 1994). This paradigm is concerned with uniqueness and the context in which it occurs (Myers, 1997). "Interpretive methodology is directed at understanding phenomenon from an individual's perspective" (Creswell, 2009, p.8), and those who follow the interpretivist paradigm are interested in understanding the complexities of social experiences from “the point of view of those who live it” (Schwandt, 1994, p.221). This is closely linked to Weber’s late 19th-century concept of *Verstehen* in sociology, which seeks to understand or grasp the meaning of social phenomena (Schwandt, 1994). Guba and Lincoln (1989) suggest that understanding the subjective world of human experience is the central purpose of interpretivism.

In the interpretivist paradigm, subjectivism is much more prominent than objectivism. Subjectivism states that “the world does not exist independently of our knowledge of it” (Grix, 2004, p.83). This supports an interpretivist ontology, which holds that the world is socially constructed. In the words of Scotland (2012, p.12), “events are not reduced to simplistic interpretations; new layers of understanding are uncovered as phenomena are thickly described”. The positivist paradigm, conversely, favours objectivity. Positivism is the belief that everything in the world can be measured, tested and quantified, meaning that there is only one version of reality, which can be scientifically studied to understand it (Kivunja and Kuyini, 2017).

It is often the case that quantitative research is conducted from a positivist viewpoint, and qualitative research is conducted from an interpretivist perspective. However, this is not always the case, and it is indeed possible to use alternative combinations. Searle (2006) even goes as far as to suggest that ontological subjectivity (existence only as experienced socially) does not prevent epistemic objectivity (can be independently ascertained as true or false). This complicates paradigmatic positioning as here, the researcher is saying that, for example, a positivist epistemology can combine with interpretivist ontology.

In addition, the positivist-interpretivist paradigms are often seen as opposites on a continuum, which does not account for the alternatives which fall between the two. Critical and subtle realism, for example, provide a mid-point which focuses on ideological change and societal empowerment (Angen, 2000). These incorporate methodological decisions which account for aspects of both positivism and interpretivism. Pragmatism also offers an alternative which takes a more pragmatic approach to research, meaning that the viewpoint is not the focus, but the actual question is (Ansell, 2016). “Pragmatism is a paradigm that claims to bridge the gap between the scientific method and structuralist orientation of older approaches and the naturalistic methods and freewheeling orientation of newer approaches” (Kaushik and Walsh, 2019, p.2; Creswell and Poth, 2016). Pragmatists make decisions about how to best answer a research question methodologically, irrespective of positivist or interpretivist tendencies. This approach must be well documented and justified, as an individual viewpoint has the potential to influence the answers to the research questions, whether consciously or not. It also offers a solid grounding for mixed methods research, enabling an author to use both qualitative and quantitative methods, if it can be justified as a result of the questions being addressed.

Pragmatism has been criticised for its ‘problem-centred’ nature, with some research arguing that this limits the ability of pragmatists to identify and analyse concepts such as social structures (Thompson, 1996). This means that questions will often be framed negatively, focusing on the problem rather than solutions. This issue, whilst important to be mindful of, does not appear to be a common stance, with others referring to it as the ‘theory of inquiry’ (Legg and Hookway, 2008). Pragmatism has also been referred to as “philosophically passé and politically naïve” (Elkjaer and Simpson, 2011, p.57), suggesting that it fails to take into account the importance of taking a philosophical stance.

Whilst these assertions are important to consider, there are also a plethora of researchers who advocate for pragmatism as a philosophy (Peirce, 1982; Ormerod, 2006; Biesta, 2010; Morgan, 2014). Pragmatism offers an experience-based approach to research, taking the context of the researcher’s own lived experience into account to aid in their understanding of the world. This in itself is a worldview, an individually centred one which can account for nuances in a researcher’s own views, which can bring an added richness to the research and data presented through a pragmatist viewpoint.

3.3.2 Social enterprise philosophy

Is social enterprise a natural phenomenon? It could be said that this kind of business model has existed for much longer than the term itself. For example, the UK Department of Trade and Industry released a social enterprise strategy in 2002 which included worker cooperatives in its definition (Department of Trade and Industry, 2002, p.13), and the first documented worker cooperative was actually established in 1844 as the Rochdale Equitable Pioneers Society (Fairbairn, 1994). If the model existed before the term, then it could perhaps be said that the phenomenon is natural.

Searle (2006) differentiates between ‘observer independent’ (aspects of reality which exist independently of social constructs) and ‘observer relative’ (aspects which do not exist without social constructs) phenomena. From these definitions, as is the case for the majority of social science according to Searle (2006), social enterprise is entirely ‘observer relative’ and the concept would not exist without ‘conscious agents’. This indicates that social science sits largely at the interpretivist end of the spectrum.

In the context of social enterprise, whilst the concept is indeed socially constructed and not yet well defined (see Chapter 2.2 for a detailed discussion on social enterprise definitions), this is not to say that it does not exist. Social enterprises often do not define themselves as such, but when considered in the context of currently accepted attributes of such a company, they fulfil all of the criteria. This does not mean that they are not social enterprises, but would we go so far as to say they are a natural phenomenon? Social enterprises, whilst around for a long time, have only recently adopted the name, yet business itself could also be construed as socially constructed.

When taking this viewpoint, a clear interpretivist ontology is demonstrated. A view could be taken that physicality demonstrates greater realism (Romero, 2018) and whilst business premises, personnel and products can physically exist, the business itself perhaps does not. Whilst the counterargument could suggest that such aspects are the embodiment of the business, it is difficult to place a definitive on what a business actually is. At its core, it is the trading of products or services. For some, the product, the physical item which is bought and sold is the embodiment of the business. However, without staff, infrastructure and technology, the items cannot be sold. Similarly, without the product, there would be no reason for the staff, infrastructure, and technology. So, the business is, therefore, the combination of all of these things, which look very different in each business scenario. Whilst the product may or may not be physical, the act of trading is more difficult to accept as independent of a social construct. Therefore, in conclusion, this research will use the ontological assumption that social enterprises, like other businesses, are socially constructed, and are not a natural phenomenon.

3.3.3 Pragmatism in qualitative research

Pragmatism is a philosophical approach that emphasises practicality and usefulness in solving real-world problems. In the context of qualitative research, pragmatism can be applied in several ways (Denzin and Lincoln, 2017). Pragmatism as a philosophy has some key implications which will be explored in turn and applied to this research.

First, pragmatism acknowledges that research questions and goals should be grounded in the practical needs and concerns of the research participants and stakeholders. This means that qualitative researchers should be sensitive to the real-world context of the research and the needs of the participants, and design their research questions and methods accordingly. The nature of this research includes a highly practical issue, one which can be sensitive, especially to those stakeholders who produce the waste as they may not want to disclose such information to members of the public. This issue should be dealt with in a sensitive, open and honest manner so that these stakeholders understand the purpose of the research.

Second, pragmatism emphasises the importance of flexibility and adaptability in research design. Qualitative research often involves iterative processes of data collection and analysis, and pragmatism encourages researchers to be open to modifying their methods and approaches based on the data they collect and the insights they gain. Semi-structured interviews allow for this flexible and adaptable approach and will be used in this research to allow for the exploratory nature of the research questions to be answered.

Third, pragmatism values the practical implications of research findings. Qualitative research can be used to generate practical insights that can inform decision-making and action in various contexts. Pragmatic qualitative researchers are focused on producing findings that can be translated into actionable recommendations and solutions. Food surplus is very much a practical subject with actionable implications should the research come to such conclusions. Using a pragmatic approach will aid in making the recommendations suitable to share beyond academic audiences.

In summary, pragmatism as a philosophical approach to this research is well-suited, and will be the philosophy applied within the planning and analysis of this study.

3.4 Theoretical perspective

Granovetter's 'strength of weak ties' theory will be used in this research, as discussed within the literature review. The categories of network theory identified by Monge and Contractor (2001) identified Granovetter's theory as a 'self-interest' theory, where individuals act in their own interests as their motivation for engaging in social actions. Granovetter's theory discusses the nature and strength of social ties within a network.

The importance of establishing network boundaries within a network analysis - that is, identifying which relationships are of interest to the research and just as importantly, which are not - is important in order to set relevant parameters (Prell, 2012). This also helps to determine where the network ends, as it would otherwise be infinite. Using an egocentric network around a particular focal organisation helps to draw these boundaries as the interest is focused on the relationships between the ego node and the associated alters. In the case of this research, the supermarket will act as the ego node. A different way of creating a boundary could be to use a product supply chain, for example, or something similar with a set beginning and end. The actors of interest are, in this case, those who have some direct or indirect involvement in a stage of the food surplus supply chain. For this research, the flow of surplus food will be mapped from the supermarket (ego node) out to the organisations they work with in order to reduce food surplus (actor nodes). This combines the two approaches, using the supermarket as an ego node to map the flow of a product in the form of a supply chain.

This research aims to identify how the impact of certain network relationships could aid in the distribution of UK supermarket food surplus, and the effectiveness of social enterprises within this area. Questions will be asked of multiple stakeholders, in order to better understand where the strong and weak ties in the network are, as per Granovetter's theory and utilising the four key factors he suggests as a starting point, and how they impact on overall effectiveness of the supply chain. This information could be used to determine where any change should originate from in order to maximise effectiveness. However, an indication of motivation will also aid in this, to be able to better understand how behaviours may change and with what purpose. Using a qualitative approach will help to better understand the nature of the relationships and allow for a wider explanation of the strength of the ties. The indication from Monge and Contractor (2001) that Granovetter’s theory is based on self-interest could be helpful in understanding this from an alternative perspective.

It will be of use to the research to initially establish a network map of where there are relationships and connections in order to understand the complexity of the network, then try to examine and understand the nature, drivers, and motivations behind these connections in order to establish whether such ties are strong or weak. Drawing these together, the research will then aim to assess the effectiveness of different relationships across the network by identifying how strong and weak ties are used variably throughout the process.

Identification of strong and weak ties will be made comparatively on the basis of the operationalisation of Granovetter's four factors needed for categorising the tie. Considering these factors comprehensively alongside qualitative supporting information, and providing a complete overview of the relationships in this way will allow for a fuller understanding of how social enterprises fit into the network, and where differences between theirs and others' ties may impact the production of value, for the benefit of the food surplus redistribution process.

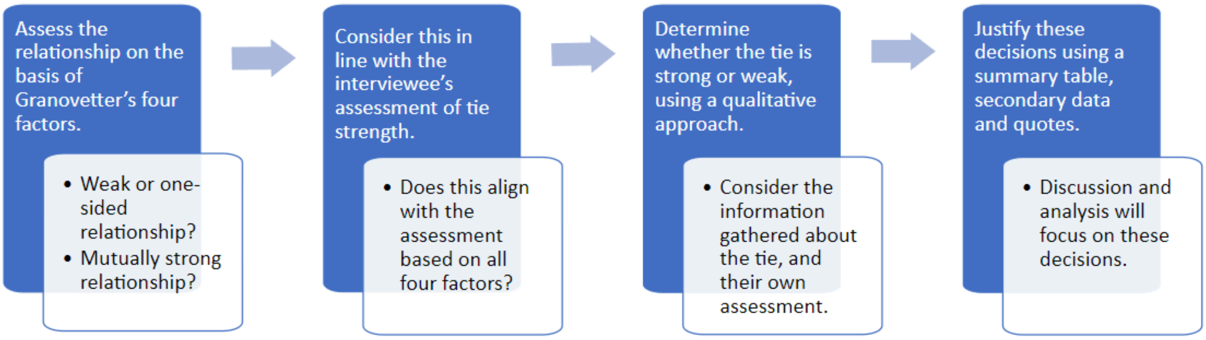
Granovetter's particular network theory provides a solid base which spans both organisational and supply chain literature. This is important in the discussion around food surplus, and how, through the use of a multitude of network relationships, changes can be made. In order to fully understand these relationships and how they fit together, considering networks in this way allows for a pragmatic and logical viewpoint to be taken.

3.4.1 Operationalising Granovetter's theory

Granovetter's theory presents a useful lens through which to study organisational relationships, despite its focus on individuals. Most organisations operate with a high degree of self-interest in order to keep them sustainable (Monge and Contractor, 2001), aligning it well with this type of theory. Granovetter's theory has previously been applied to organisation-level relationships, particularly in the context of information exchange and interoperability, (Papakyriazis and Boudourides, 2001) and commitment (Stanko et al, 2007). Personal relationships within these networks are important to build trust between organisations and to epitomise the relationships on the basis of the factors identified by Granovetter, but the study will primarily focus on organisational relationships rather than personal ones.

The process will be adopted as visualised in Figure 3A below:

Figure 3A: Process flow chart.



Allowing both parties to describe their relationship, on the basis of the factors identified by Granovetter (1983) within the theory, will begin to show any misalignment in opinion, or will help to validate the other's perspective. The factors identified by Granovetter (1983) are the amount of time spent in communication, emotional intensity, mutual confiding and reciprocity. These factors allow an opportunity to not only understand the nature of the relationship but also whether both parties agree on how the relationship works. In order to maximise the level of data gathered from this instrument, initially, the ability for the participants to talk openly and freely about each topic will be given. This will allow them to start thinking about the relationship in detail, and can then be followed up with numerical ratings for comparative purposes. These ratings will be fully defined for participants in order to ensure consistency. This information will be useful in being able to develop a network diagram which incorporates the strength of the ties in a visual way, based on the input from both parties as part of the assessment process. Each of the four factors can be explained as follows.

Time spent on relationship will have focused questions for each tie within the network, to assess how many hours are typically spent on the relationship in a given time period, how often they are in contact, and how long the relationship has existed. This will allow for an indicative assessment of the amount of time spent, but the added benefit of a qualitative approach gives the interviewee the opportunity to explain their answers, perhaps indicating if they think the time spent is sufficient, if it works well for them and if they are satisfied with the amount of time spent on it. Granovetter's (1973) theory states that "stronger ties involve larger time commitments" (p.1362). With this in mind, an assessment will be made based on the responses to these questions from both parties. See the descriptions in Chapter 2.3 for more detail.

Emotional intensity will be measured on the basis of trust between each other, and in seeking advice, as per Granovetter's original theory which indicated these as signs of strong emotional intensity. He asserts that trust is "integrally related to the capacity to predict and affect their behaviour" (Granovetter, 1973, p.1374). Using a similar type of qualitative approach will allow for understanding and wider discussion on the nature of these relationships, in relation to these kinds of factors. Again, the assessment will be made based on the qualitative explanations from both parties. See the descriptions in Chapter 2.3 for more detail.

Mutual confiding will be assessed based on the sharing of confidential information, or the willingness to. As this study is very much concentrated on organisational relationships rather than personal ones, the focus should not be on confiding between individuals on personal issues, but more focused on evidence of information sharing between the two organisations. This factor is not expanded upon extensively in the original theory, other than to assert that strong ties are often made up of all four factors in a "probably linear" manner. Interpretations of mutual confiding have been made since all following a similar path in terms of sharing confidential or personal information. As the same questions will be asked of organisations on both sides of the relationship, this should allow for useful insights to be established for this factor. See the descriptions in chapter 2.3 for more detail.

Reciprocity will be discussed on the basis of mutual benefit, and whether organisations see the relationship as beneficial to both parties to a similar or differing extent. Again, this point was not elaborated upon in the original theory, but discussions and research around reciprocity form its own body of literature, all focused on the giving and receiving between two parties, whether direct or indirect. This will therefore help to establish what each organisation feels they get out of the relationship and what they feel they give in return which benefits the other party. See the descriptions in chapter 2.3 for more detail.

Overall rating will be established qualitatively based on the discussions summarised in these four areas. All of the factors being high may not simply determine this, but in fact a more nuanced and context-driven understanding of the relationship, triangulated with the rating given by the interviewee, aiming to better understand the participant's view of the relationship as a whole.

"Tie strength is a relative concept and best understood in relation to other ties" (Prell, 2012, p.137), which is important in determining the strength of the ties. Gathering sufficient data and having the ability to look at the ties in a relative manner will be important in developing a true understanding of the ties and the network.

These discussions will be summarised in a table, as shown in Figure 3B. This will aid with compiling the data and demonstrating a clear overview of the justification for each decision. Each relationship will then be discussed in more detail, including quotes and supporting information from secondary sources. This will enable the justification to be followed up via the cross-case analysis and provides a good summary of the ties. The results from this exercise will then be illustrated using a network map which shows the strong and weak ties visually.

Figure 3B: Template for the assessment of strong and weak ties.

	Time spent on relationship	**Emotional intensity**	**Mutual confiding**	**Reciprocity**	**Overall strong or weak tie?**
Stakeholder 1 -Stakeholder 2					
Stakeholder 2 -Stakeholder 3					
…					

This table will then be used to elaborate on each relationship to create a full analysis based on these discussions and supported with evidence, including from secondary sources such as sustainability and annual impact reports.

3.4.2 Understanding the food waste network

The stakeholders within the food waste network could be classified according to the type of involvement in the food waste supply chain. When considering the group of stakeholders as a whole, some actually produce the waste, and others help them to manage the waste. They all have a part to play in reducing waste, and they all have motivations to, whether economic, social, or environmental. These motivations are visualised in Figure 3, including, for example, governments, who may not have an economic investment in terms of reducing waste as they would not make money from it, but their economic considerations come in terms of limiting government spending where possible. Their motivations would be largely social as they aim to act in the interests of wider society. Social enterprises have both social and economic aims, and many also share an interest in environmental aims too. In an attempt to help understand the stakeholders involved, they can be separated into the core stakeholders – those who produce the waste – and external stakeholders – those who help them to manage it. As a result of increased societal focus, the core stakeholders themselves also contribute to managing waste levels, though sometimes independently, using in-store initiatives such as price reductions and offers, and sometimes with the help of an external stakeholder such as a charity, NGO, or social enterprise. This is visualised in Figures 3C and 3D below.

Figure 3C: Stakeholder map of food waste, demonstrating the core and external nature of their involvement.

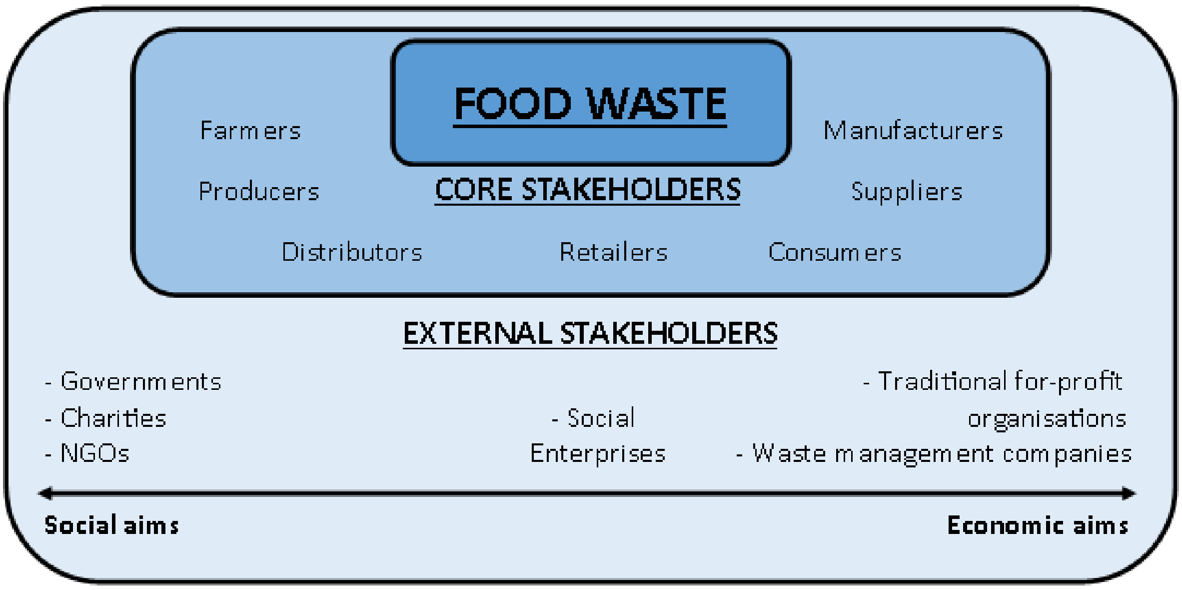
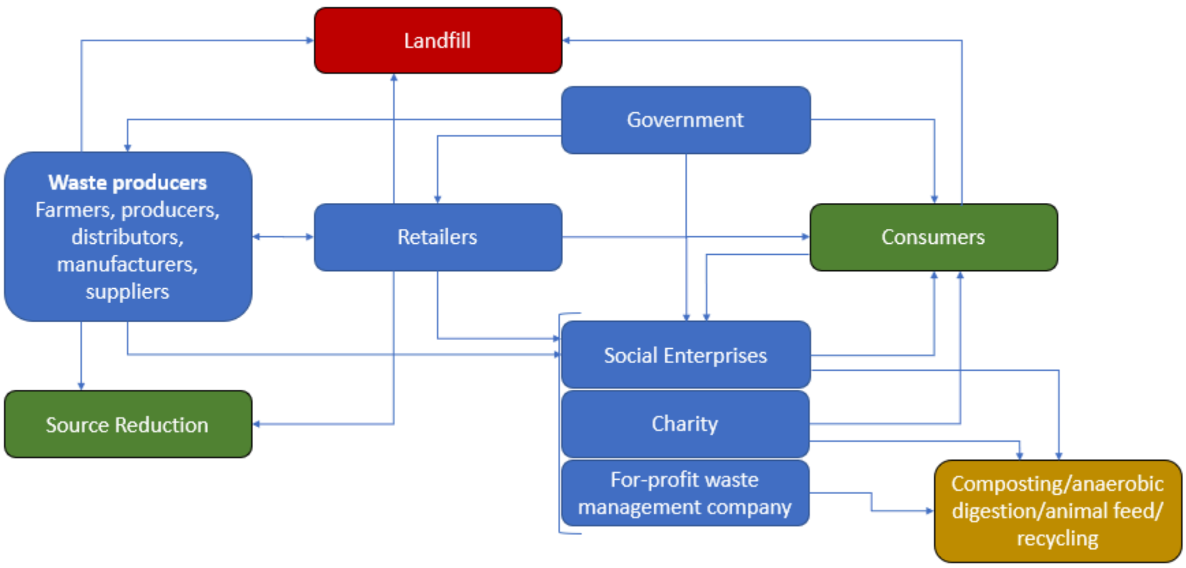


Figure 3D shows a hypothesised network diagram based on earlier sections of this thesis and existing research. This will act as the basis for the research, which will aim to develop it into a detailed network diagram which shows the relationships between the stakeholders and the strength of those relationships. The classification of strong and weak ties and how the strength of relationships will be assessed was previously shown in Figure 3B.

Figure 3D: Network diagram showing interactions between stakeholders and food waste management options.



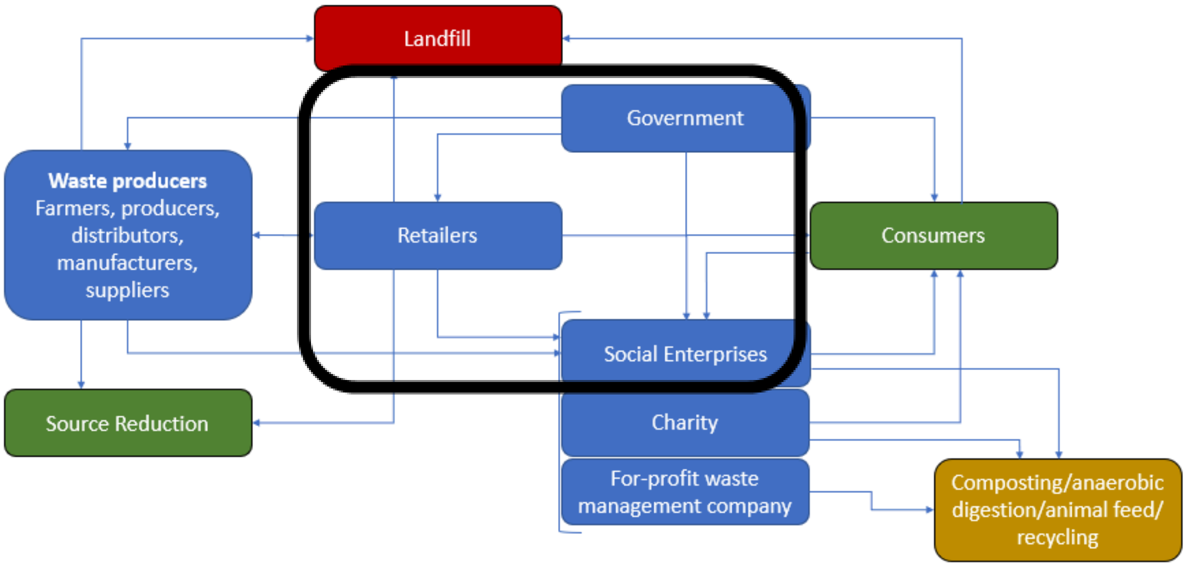
The food goes from farmers, producers, distributors, manufacturers, and suppliers to retailers for sale to consumers. Any food not sold to the retailers can either be sent to a social enterprise, charity, or a waste management company, or it can be sent to landfill/left to rot in the ground. If the retailer does not sell the food, they have four main options:

- send it to landfill;
- send it to a social enterprise for either redistribution to consumers or to compost/anaerobic digestion/animal feed/recycling;
- send it to charity for redistribution to consumers or to compost/anaerobic digestion/animal feed/recycling;
- send it to a bio waste management company for composting/anaerobic digestion/animal feed.

The best-case scenario for food would be source reduction from producers and retailers, or food getting to and being eaten by consumers, as highlighted in green on the diagram in Figure 3D. This is followed by the next stages of the hierarchy– recycling, animal feed, anaerobic digestion, and composting – highlighted in yellow. The worst-case scenario is that the food goes to landfill (see Table 2A), highlighted in red. The arrows demonstrate the different ways that food can get to a consumer, either directly from a retailer or via a social enterprise or charity.

This research will focus on the dyadic relationships between social enterprises, local and national government and supermarkets, as highlighted in Figure 3E. This will help to determine the strong and weak ties within the network and how they interrelate between each other.

Figure 3E: Network diagram showing the section of the map this research will focus on.

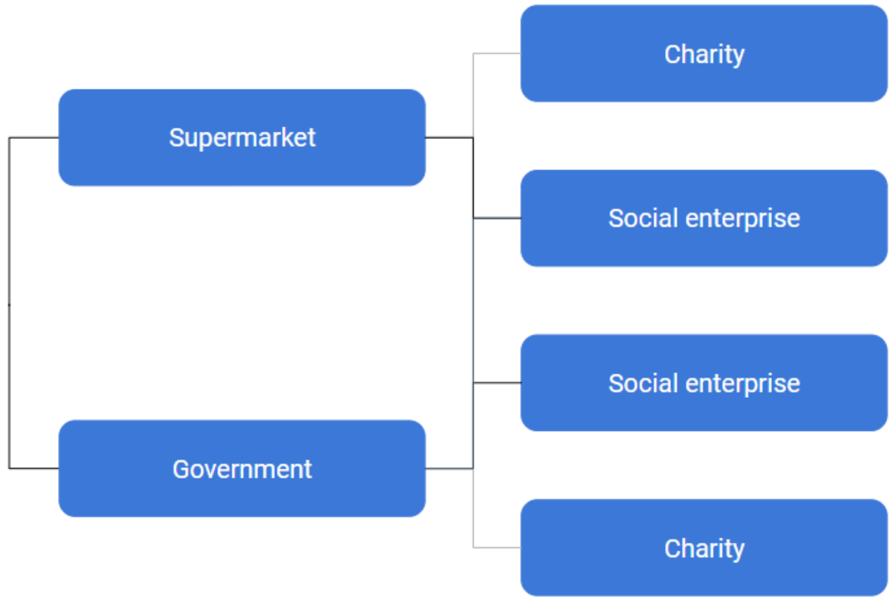


PROPOSITION 9: The macro-level map of food surplus networks will mirror that in Figure 3E.

MEASUREMENT: Development and analysis of the network map and further assessment during the interviews, particularly around the different types of organisations in their networks.

For each supermarket which will be taken as a unique case study, the dyadic relationships which form the supply chain will be the focus of the study as follows (highlighted here in black). This is a hypothetical diagram which illustrates an example of how the network may look.

Figure 3F: Hypothetical network diagram, highlighting the dyadic relationships of interest.



3.4.3 Propositions and Unit of Analysis

As a result of this discussion on the theory, a set of propositions has been formulated alongside a unit of analysis to be used within the research.

The unit of analysis used to test the propositions below is the dyadic relationships between supermarkets, governments and social enterprises, as highlighted in Figure 3F above.

These propositions have been referenced in earlier sections of this thesis alongside the relevant discussions, and are summarised here for ease of reference. The final column demonstrates the research question which is being operationalised, and relevant to each proposition.

Table 3A: Summary of propositions and alignment with the research questions.

		RQ
PROPOSITION 1	The more time spent together (both frequency and duration), the stronger the tie.	1
PROPOSITION 2	The higher the emotional intensity score, the stronger the tie.	1
PROPOSITION 3	The higher the score for mutual confiding, the stronger the tie.	1
PROPOSITION 4	The higher the score on the reciprocity scale, the stronger the tie.	1
PROPOSITION 5	More weak ties present in a network lead to more widespread success in the reduction of food surplus.	4
PROPOSITION 6	Food surplus will be distributed by organisations following the food waste hierarchy.	2
PROPOSITION 7	Social enterprises rely on both strong and weak ties for their success.	3
PROPOSITION 8	Bridging ties will exist within food waste networks to facilitate food surplus management.	4
PROPOSITION 9	The macro-level map of food surplus networks will mirror that in Figure 5.	3
PROPOSITION 10	There will be factors which facilitate effectiveness in the network and factors which act as barriers.	4,5
PROPOSITION 11	Motivations will be primarily economic for supermarkets, and primarily social for social enterprises and governments.	6

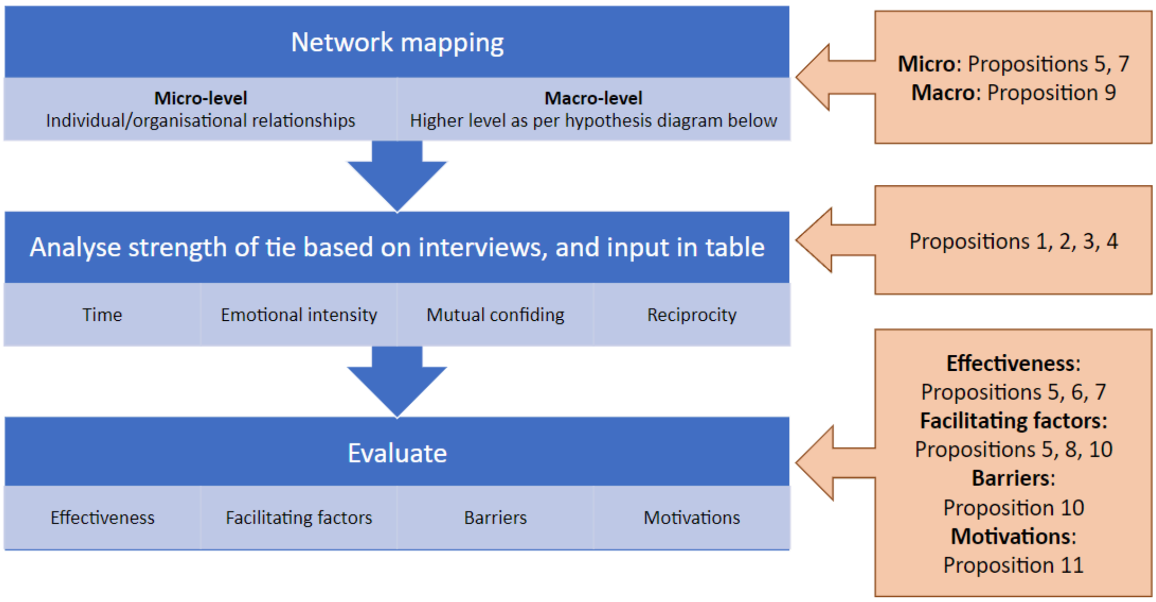
The propositions cover multiple angles which could be investigated throughout the course of this research, all based on the theory and can be analysed using the theoretical background. The following models will show how the propositions link together and how they will be tested.

3.4.4 Models

The following models will aid in the visualisation of the study and how the propositions translate into answering the research question.

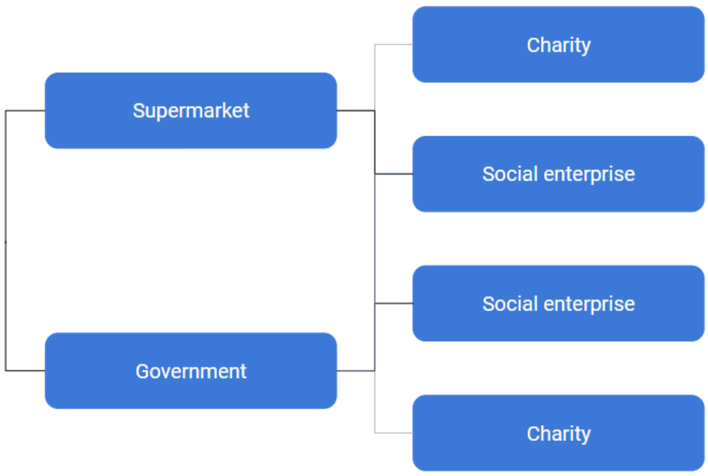
The first shows the proposed outputs from the study and how they relate to the propositions listed in section 3.4.3.

Figure 3G: Model demonstrating the proposed outputs in relation to the propositions.



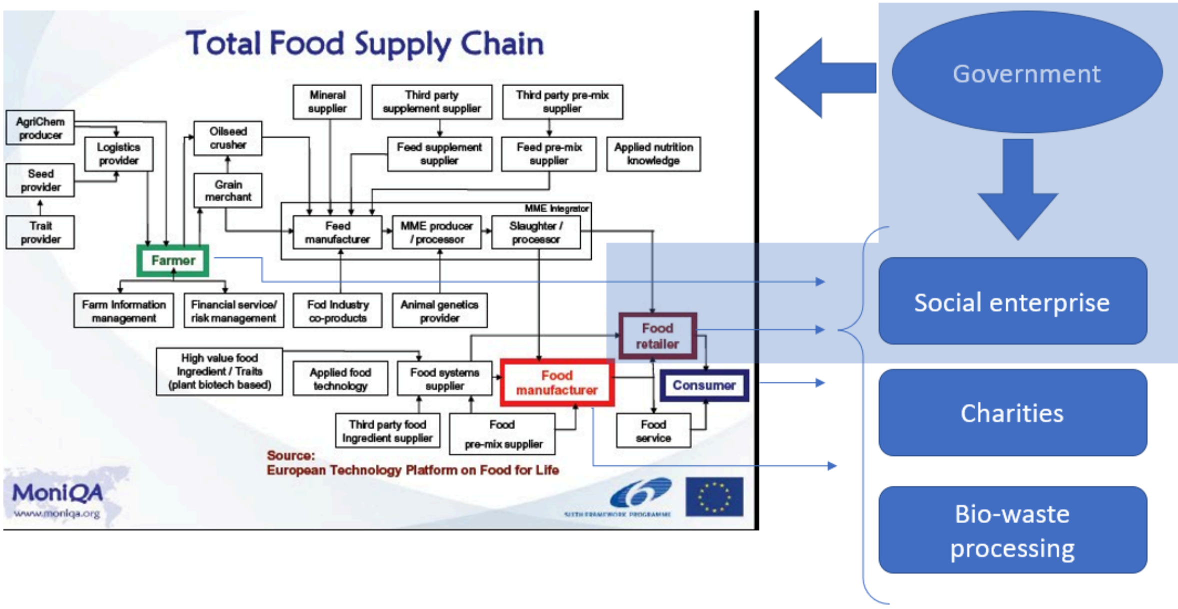
The second, introduced in section 3.4.2, visualises the unit of analysis – this being the dyadic relationships in the context of food waste between social enterprises, supermarkets and the government.

Figure 3H: Hypothetical network diagram, highlighting the dyadic relationships of interest.



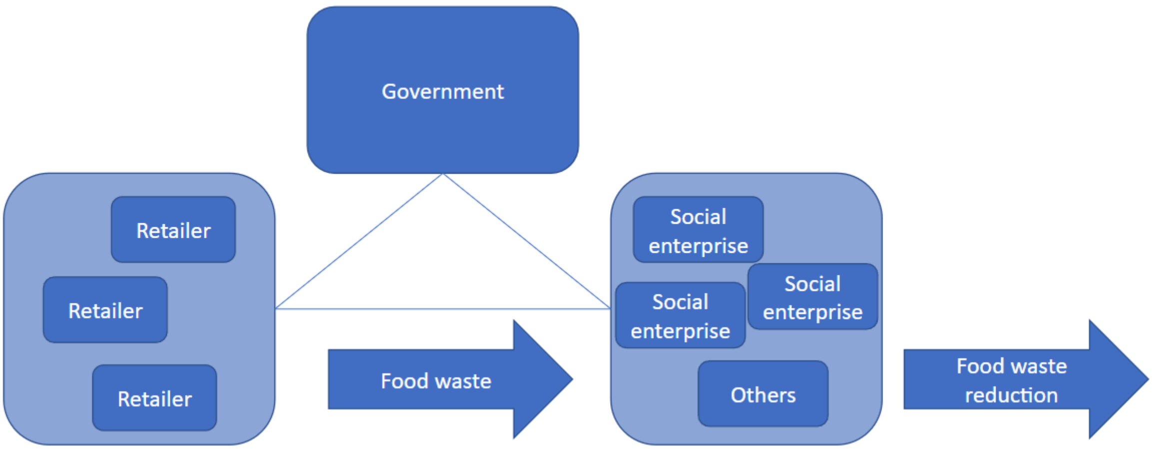
The third situates this set of dyadic relationships in the wider food system. This shows a European interpretation of the total food supply chain, and the highlighted section shows where this study fits into it.

Figure 3I: Network map of the food supply chain, demonstrating the section which this study focuses on.



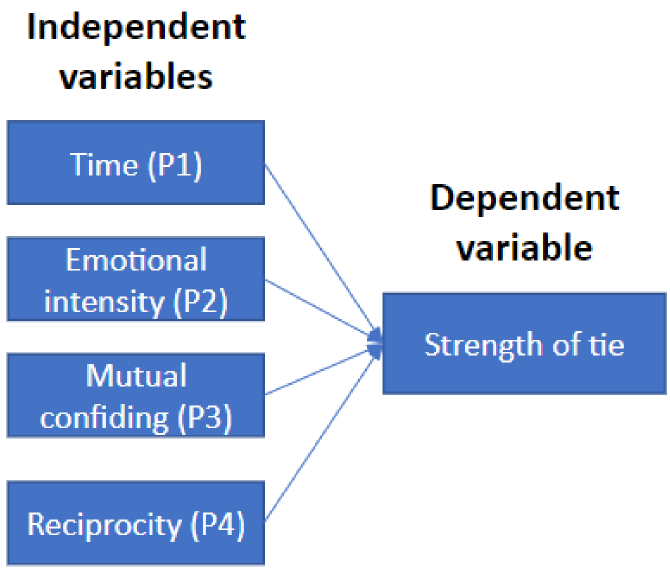
The fourth shows a flow model. This model demonstrates the wider macro view and suggests that where food waste comes from the supermarkets - governments, supermarkets and social enterprises/others (such as charities, NGOs and food banks) can work together to facilitate a reduction in food waste.

Figure 3J: Flow model demonstrating how food waste is produced and managed.



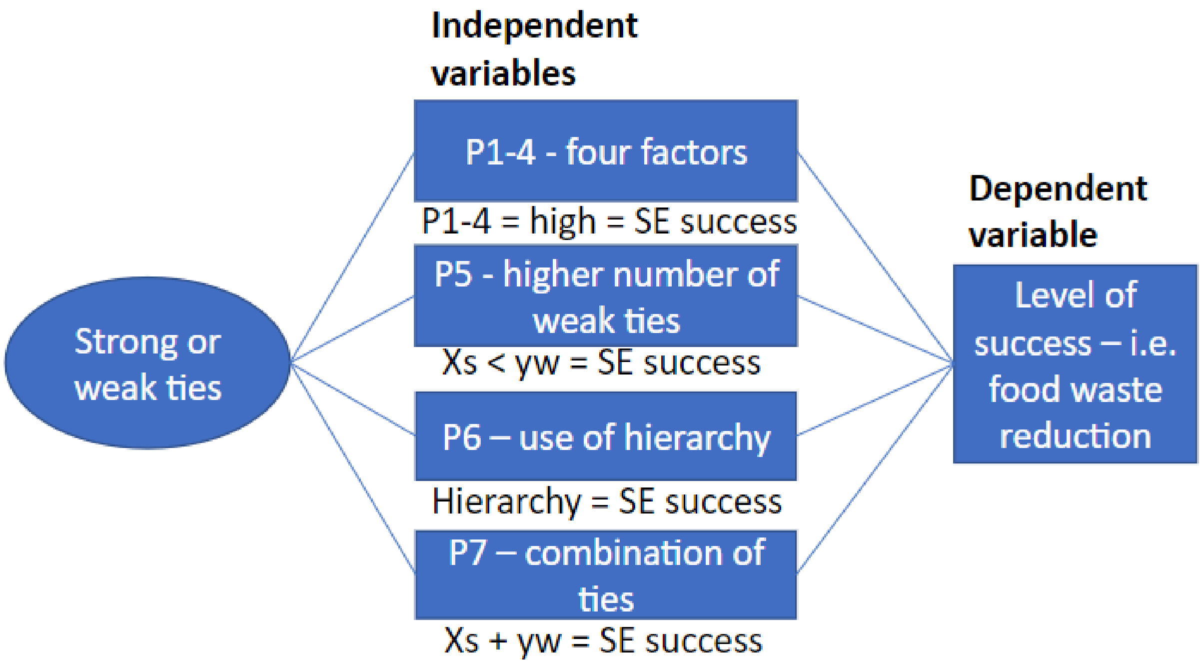
The fifth considers the variables involved in the study and what it is aiming to demonstrate, through the means of independent and dependent variables. This is split into two main parts. The first shows the relationship between the four propositions based on Granovetter's theory and tie strength, proposing that the four factors together have an impact on the strength of the tie.

Figure 3K: Illustration of variables for propositions 1-4.



The second shows how this, alongside other factors, then translates to demonstrating the effectiveness of social enterprises.

Figure 3L: Illustration of variables relating to social enterprise success.



The next section will aim to consider different research methods which could be used to test these models and propositions, containing justifications for these choices throughout.

3.5 Possibilities for answering the research questions

In the development of a research design, several options were contemplated in order to answer the research question and address the propositions. As a pragmatist, both qualitative and quantitative approaches were considered.

The nature of the subject, where limited literature exists which overlaps both food waste and social enterprise, but bodies of literature exist on the two individually, means that either qualitative or quantitative study would be suited to the research.

The exploratory nature of qualitative research would enable more in-depth investigation into the topics, looking at how they overlap and interact. A quantitative approach could utilise existing research to test a suggested theory which is based on qualitative methods. Within this, potential methods could emerge, such as surveys or experimental methods (quantitative) or interviews, ethnographic observations, or document analysis (qualitative).

3.6 Answering the research question

3.6.1 Research Design

Research design underpins the entire strategy used to address the different aspects of a study to ensure that the study is best designed to answer the research question. As proposed by Miller and Salkind (2002), research design is "of great importance, because it influences all the outcomes of the study" (p.18). As Bechhofer and Paterson (2000) emphasise, in order to conduct research, one must consider the aims and objectives of the research to select the best set of procedures to enable these to be met. This appears to be a pragmatic viewpoint in itself, as philosophical perspectives would also play a key role in this decision-making. Research design differs from research methodology, as where methodologies are the tools used to carry out research, design is the precursor which guides a researcher from a research question through the stages of establishing theory, collecting data and analysing data; it is a tool for planning and structuring each component and procedure within the study (Grunow, 1995). Mackey and Gass (2015) highlight the need for justification of the choice of methodology in the context of the research question; appropriate and thorough research design, prior to making methodological choices, assists in this justification.

Feasibility is an important consideration to ensure that it is possible to access participants and collect the required data (Mackey and Gass, 2015). This will be considered during the selection of participants to include in the research. Thought should be given, for example, to the potential communication methods and how face-to-face methods, including visiting the organisations in person, could produce richer data when compared with distance methods such as telephone and video calling, but distance methods make a wider field of participants more accessible, and recording is far easier.

The research design for this study will be broken down and considered in detail in the subsequent sections.

3.6.2 Case studies

A comparative (cross-case) case study design (Yin, 1981, Eisenhardt, 1989) will be used to structure a series of interviews, documents and secondary data sources within this research. The aim of the study is explanation and exploration – to explain the food surplus supply chain and explore how social enterprises fit within the network. Such comparison aids in understanding the conditions required in order for a specific phenomenon to occur (Della Porta, 2008). Indeed, Gerring (2001) argues that all knowledge is comparative and everything is considered in the context of something else. Yet, in the absence of an existing study on which to expand, producing multiple cases will be useful for analysis and interpretation of the data.

Each of the three sampled supermarkets will form a case study made up of a combination of semi-structured interviews and document analysis from supermarkets, government, and social enterprises, which will then be analysed and cross-compared. Cases will be identified based on convenience sampling methods as detailed in 3.6.5, which could involve a combination of local, regional, or national relationships, and should allow for a widespread understanding and thorough interpretation of the situation.

3.6.3 Qualitative interviews

Qualitative research seeks to identify meanings and generate a deeper understanding of a phenomenon, allowing for detailed, subjective exploration of a topic. It is inherently inductive, generating hypotheses throughout the research process. A high level of flexibility is required from the researcher for knowledge to evolve. Questions are generally open-ended, emphasising the focus on knowledge discovery (Harwell, 2011).

Social enterprise is not a new business model, but the term itself is relatively new, with no agreed definition as yet (Ali et al, 2023). Thus, as it is still in its relative infancy, qualitative research is commonly used to research social enterprise in order to establish the initial depth of data and to work out which questions would be useful to answer quantitatively. Bull et al. (2018) identify that research in this area is still looking to "develop a better conceptual understanding as well as to deepen our awareness of practice" which would support a largely qualitative approach.

Semi-structured interviews will be held to attempt to establish a wide picture of the retailer and social enterprise food waste network in the UK. "Semi-structured interviews follow a general script and cover a list of topics but are also open-ended" (Bernard, 2012, pp.181). A semi-structured approach allows for flexibility in asking further questions, which may enrich the results or provide a greater understanding of the subject area, which may not have been considered prior to the interview. Prompts may also be used to encourage participants to expand on their responses (Leech, 2002). This method allows for flexibility, which is helpful in qualitative research as its exploratory nature means there may be things that come up in interviews which are useful to encompass greater understanding but were perhaps not considered previously. This approach will be useful to allow for wider discussions to take place around Granovetter's four key factors and the propositions listed in section 3.4.3.

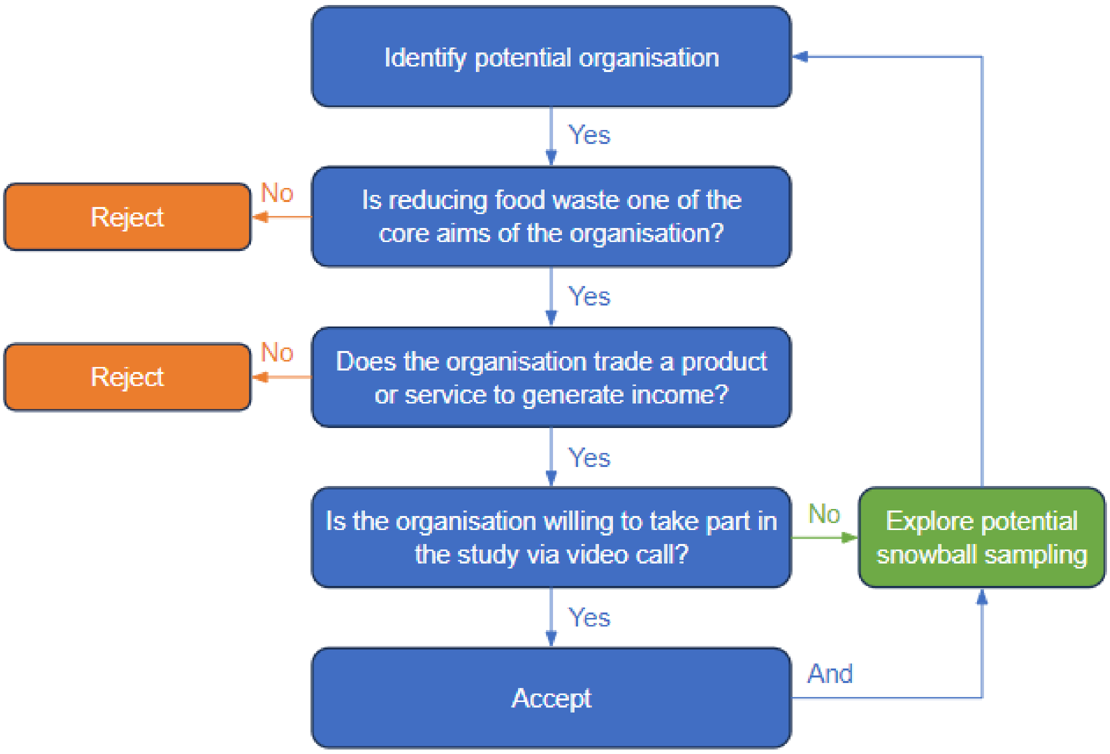
The semi-structured interviews will collect qualitative data from social enterprises, supermarkets, and government departments (both local and national). From this, some in-depth, exploratory data will be collected to assess the relationships within the networks, the challenges faced by the social enterprises in working towards their goals, how food retailers work with social enterprises to work towards common goals, and how government involvement fits into the network and assists social enterprises in their aims. Interviews will be conducted online via video-calling software, which allows for easier access to participants and recording of the interviews with consent from the interviewee. Whilst face-to-face interviewing has its benefits over virtual, in this case, due to the COVID-19 pandemic which began during the course of this research, there has been a significant adjustment to working practices and individuals' confidence in using video-calling software (De et al, 2020) and a vast increase in the use of such software across all age ranges (Branscombe, 2020). Whilst face-to-face interviewing is often preferred as it allows for rapport to be developed which may, in turn, lead to more honest and thorough answers being given by the participants (Irvine et al, 2013; Bowden and Galindo-Gonzalez, 2015), it is now likely that people feel just as safe and comfortable in sharing such information via video calling due to this rise in usage and commonality, and rapport can still be developed via this method.

The participants will be divided into the three main stakeholder groups which will be involved in the research as follows: social enterprises, supermarkets, and governments. All participants will be adults (over 18 years old), a mixture of male and female and able to personally provide informed consent to participate in the study. Participants will be initially approached by email, followed up by further emails should they not respond, and where possible, a telephone call. LinkedIn may also be used as a platform for connecting with potential interviewees directly. None of the participants will be known to the researcher personally and all relationships are solely limited to being of a participant-researcher nature.

Social enterprise participants and those from supermarkets will be selected initially on the basis of expert and convenience sampling, followed by snowball sampling methods. Government participants will be specifically targeted using an expert sampling approach. Participants will be identified using an internet search of relevant social enterprises and retailers in the UK. This will include websites, company reports, policy documents and directory websites. As a result of snowball sampling, this will then be expanded upon as more is discovered about the network, but this will not go beyond the parameters of social enterprises, government representatives and supermarkets unless it is deemed relevant by the researcher.

Expert sampling, a type of purposive sampling which selects experts in a particular field to be participants in a study (Etikan et al, 2016), will be used to select participants with relevance to the research area. It will be used to select interview participants who can provide a range of experiences and insight into the subjects of the study. This will be combined with convenience sampling, as access will be granted by those who are willing to take part. The first interview, for example, will be completed with a colleague of a family member who works in a social enterprise in North Manchester. Social enterprises and governments will be sent a personalised invitation to take part in the study via email, explaining their own significance to the research and how it could be of benefit to them to take part. This type of sampling will be important for this study as the prominence of social enterprise, whilst rising, is still relatively limited, so they will need to be specifically selected based on a set of inclusion/exclusion criteria (Fink, 2003), primarily factors which would confirm their status as a social enterprise and whether one of their primary aims is to divert food waste from landfill. The flow chart below in Figure 3M shows the inclusion/exclusion criteria used for this research when interviewing social enterprises. This is based on the earlier discussion around defining social enterprises.

Figure 3M: Flow chart showing the inclusion/exclusion criteria for selection as a social enterprise for participation in the study.



Consideration will need to be given to the number of cases to be looked at within the research, based on factors such as how much detail is required to get a full picture of the network structures in each country, balanced against how generalisable the research could be (Plowright, 2011). A diverse case selection technique allows the researcher to achieve the maximum range of variation between cases (Gerring, 2006). Particularly in the use of expert sampling, selecting cases on the basis of difference is helpful in order to truly develop an understanding of the relationships between phenomena in order to take into account the widest selection of opinions. The diversity here enables a more accurate reflection of a range of opinions to allow for more reliable comparisons, and decisions will be made on this basis.

3.6.3.1 Question design

The design of the questions to be asked will be done using considerations from methodological research. Brislin (1986) and Oppenheim (1992) share similar views on the length of questions to be asked – 16 and 20 words respectively – both in agreement that questions should be short and easily comprehensible. Brislin (1986) also discusses grammatical factors, since supported in later literature (Dillman, 2000; Dornyei, 2003; Lietz, 2010), highlighting that questions should be written in an active rather than passive voice and that pronouns and possessive forms should be avoided, instead repeating nouns where possible to ensure clarity.

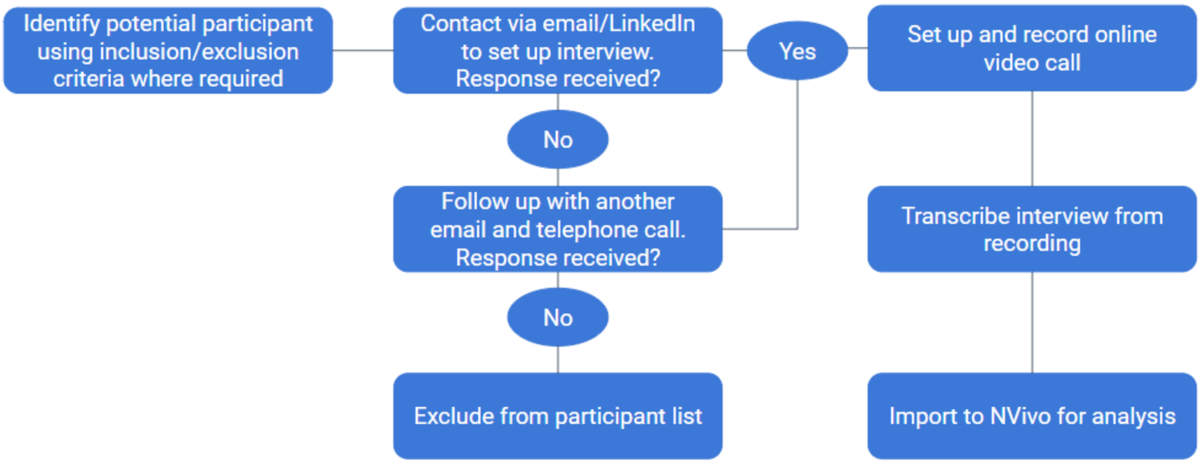
Ease of understanding is important to ensure that the responses recorded are accurate and reliable. Methods of doing so include avoiding vagueness in questions, being specific, breaking down more complex questions into multiple questions, defining any concepts with varying interpretations and avoiding negative or hypothetical questioning (Lietz, 2010). Clear questions should focus on a single concept to avoid confusion when interpreting and analysing the results (Brislin, 1986). Each of these factors is well-supported within methodological research and will be actioned in developing the questions for this study.

Social desirability can be a difficult barrier to overcome in research, as participants can feel like they should answer in a certain way to conform to a social expectation or norm. Labelled by Foddy (1993) as a ‘question threat’, reasons for conforming behaviour could be based on fear of identification, assumptions around levels of knowledge of a particular topic or perceived acceptable or favoured views within society (Lietz, 2010). This can be addressed in a number of ways. Firstly, establishing rapport with the participant to make them feel at ease, and starting with some easier, non-contentious questions to help them settle into the interview could help them feel comfortable and able to be honest with the interviewer. Secondly, emphasising the confidentiality of the research and reassuring the participant that their honesty is valued, but that their identity will be kept confidential could help to encourage them to be open. Finally, acting and speaking in a non-judgmental manner and asking questions in a way which does not assume a certain level of knowledge could also help to encourage openness and honesty in their approach to the interview. It could be said that the building of mutual respect and rapport is central to all of these factors to encourage a professional yet relaxed environment for the interview to be conducted. These factors will be considered in the development of questions for the semi-structured interviews.

3.6.3.2 Data collection and transcription process

The flow chart below demonstrates the process which will be followed during the data collection phase of the research.

Figure 3N: Process flow chart for data collection.



Potential interviewees will be contacted via email or LinkedIn in the first instance and will be provided with the participant information leaflet and a consent form in advance, detailing the use of the data provided.

The interviews will mainly be conducted over online video calls, using a platform such as Zoom. Zoom allows for easy scheduling, attendance and recording of interviews for transcription and analysis, and is a tool that many are now familiar with using. Online data collection, however, also comes with its own challenges. The first is around the ability to build rapport over the Internet, which could be said to be easier during in-person visits. Visiting an organisation in person also allows for the researcher to perhaps observe some of the operations involved in the organisation, allowing for a deeper insight. These points must be acknowledged, as attempts can then be made to counter these for online interviews.

The interviews will be audio recorded in order to fully capture the data, making it easier to refer back to for wider context where necessary. This presents data security requirements which will be in place prior to the interviews taking place. This allows for an open discussion with the participants on what will happen with their data and consent can then be given in a fully informed manner.

Once the audio recordings of the interviews have been captured, they will be transcribed for analysis. The required content from each interview will be typed out as closely to the original recording as possible, with the acknowledgement that there is some interpretation involved, some suggesting it is almost a translation between oral and written discourse (Kvale, 2007). This translation process presents a challenge in understanding which information is required to enable a reliable data source which can be analysed with academic integrity.

Whilst some disciplines gain extra insights from behaviours such as pauses, agreements and filler words (such as ‘erm’), this is not the case with this study, and as a result, there can be some omissions from the transcript which will not affect the overall validity of the data during analysis. The data required is simply the written conversation, to enable quotes to be drawn from it which support or critique the themes in the discussion, and to extract the data for the network map. As a result, linguistic and behavioural nuances such as these will not be included in transcriptions as the analysis would not differ based on their presence.

The conventions which will be adopted throughout the transcription of data for this study, therefore, are as follows:

- include full sentences and words spoken by both interviewer and participant.
- if a word is stated and then corrected by the person speaking, then the replacement word can be used instead, both do not need to be in the transcription.
- exclude filler words (such as 'erm' and 'yes'/'okay' when they are simply there to acknowledge the other person's points).
- pauses do not need to be recorded.

This understanding of what is a useful way to transcribe the data allows for valid and rigorous data transcription to take place (Kvale, 2007), which is consistent across all of the collected data.

3.6.4 Document analysis

The second source of data used is document analysis. Document analysis is a research method that involves the examination and interpretation of written or recorded data, such as reports, government publications, letters, emails, social media posts, and other artefacts (Silverman, 2016). This method is useful for understanding the meaning, context, and patterns that emerge from texts, as well as for generating insights and conclusions about a particular topic or phenomenon. In this instance, it can be used to understand supermarkets' strategies, goals, progress, priorities and motivations around managing food surplus prior to interviews, to triangulate the findings from the interviews. Where social enterprises have published impact reports, these will also be included.

There are several reasons why document analysis is useful as a research method. These include access to a large volume of data, provision of contextual information, objectivity and reliability, cost-effectiveness and flexibility (Bowen, 2009).

Documents are often readily available and can provide a wealth of information on a particular topic, without requiring researchers to collect new data. They can provide important insights into the context in which they were created, which can be valuable for understanding the meanings and implications of the data. Documents are generally considered to be objective and reliable sources of data, as they are often created by individuals who are completely external to the research, and therefore do not have a particular research question in mind when compiling the document. Some are also externally verified, especially in the case of statistics and numerical reports. Document analysis is often a cost-effective research method, as it requires minimal resources compared to other research methods, and can be used as a standalone method or in combination with other methods, such as interviews or surveys.

Company websites and reports will be assessed as part of the development of questions for the interviews and in the analysis of the data. This allows for comparisons between the publicly available information and the responses given by participants. Unlike other research methods, such as interviews, researchers cannot ask follow-up questions or probe for more information when analysing documents. This may result in gaps or limitations in the data that are not fully explored. Document analysis is limited to the content of the document, and researchers may miss important contextual or nonverbal information that could be obtained through other methods, such as observation. In order to overcome this limitation, further information will be gathered using qualitative semi-structured interviews.

3.6.5 Sampling

Convenience sampling will be the sampling method taken for this research. Convenience sampling is a non-probability sampling technique in research, where participants are selected based on their ease of accessibility and proximity to the researcher. This method is often used when time, cost, or other practical considerations make it difficult to obtain a representative sample. In this case, this sampling method has been chosen based on available access to potentially relevant participants for the study. However, convenience sampling has been criticised for its potential biases, as participants who are easily accessible may not be representative of the larger population (Etikan et al., 2016). The study will aim to counter this by utilising convenience sampling as a starting point but then proceeding from there with a different method of sampling, snowball sampling, in order to access the potentially more difficult-to-reach stakeholders. In addition, an expert sampling approach to convenience sampling will be taken, ensuring that those selected for the interviews are sufficiently knowledgeable in the information required for the study. Further details of this will be included in the relevant sections herewith.

Following the initial use of convenience sampling, snowball sampling will be the logical method of progression, as the methodology relies heavily on the pursuit of network contacts in order to establish the network in its fullest possible form. In snowball sampling, a researcher begins with a small group of participants and then asks them to refer other individuals they know to the study who may fit the criteria. This method effectively recruits participants who are difficult to reach through other sampling methods (Biernacki and Waldorf, 1981). However, the sample obtained through snowball sampling may not be representative of the larger population and can be biased towards certain characteristics. Despite these limitations, snowball sampling remains a valuable method for conducting research on hard-to-reach populations.

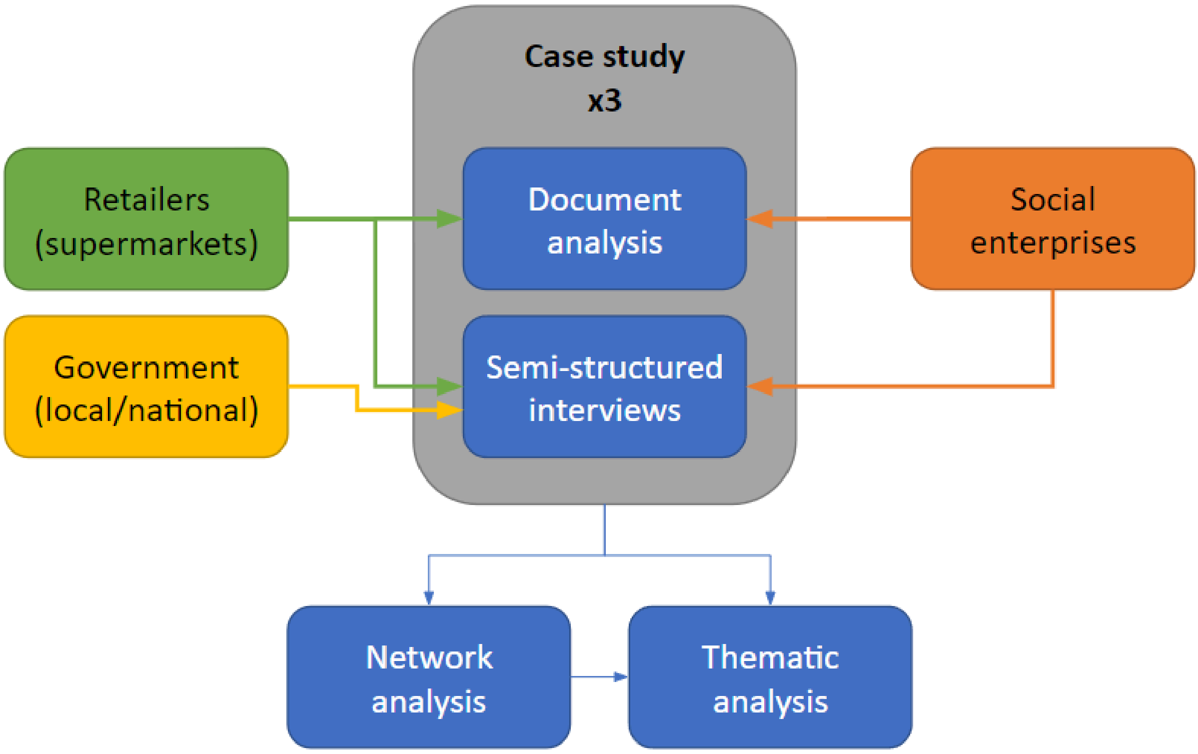
This method of snowball sampling based on the network connections leads to a conclusion that saturation can be reached by ‘closing the loop’ on the network –

getting to a point where the snowball sampling reaches its natural end as no new contacts are given. The expectation is that this will be what happens within the network, that it is able to be ‘closed off’ as no further network contacts are identified. Should this not be the case, once the key supermarkets and a set of related social enterprises have been interviewed and the network diagram is expanded to a point where conclusions can be drawn, the data collection for the particular case can reach its end, ready for comparison to another network case.

3.6.6 Combining methods

Tashakkori and Teddlie (2010) highlight that visual representations work well in research with multiple components, to “simplify the complex interrelationships between elements” (p.11), which includes data collection and analysis techniques. A visual representation of the structure of this study is shown in Figure 3O.

Figure 3O: Visual representation of research design.



This figure is a visual representation of the full methodology expected to be used in this research, as discussed throughout this section. A single case study will comprise an analysis of relevant documentation such as sustainability reports, and semi-structured interviews. Qualitative interviews will be conducted with a range of stakeholders, namely social enterprises, supermarkets, and both local and national governments. From the combination of this data, a set of themes for analysis will be established, and a network map drawn out and analysed. The thematic analysis will be supported by the network analysis, which will be used in conjunction to demonstrate a wider understanding of the case.

Both qualitative and quantitative research methods could have been chosen to answer the research questions for this study, and each has its individual merits. The primarily qualitative study chosen may not provide results which could be readily generalised, but it will provide the depth of understanding which would not be as easy to produce with a quantitative study. As a relatively new research area, both contextually and more broadly, this inductive approach, which includes the document analysis, has the potential to inform future research as it aims to gather the exploratory data needed for a wider quantitative understanding.

3.6.7 Data collection summary

Data will be collected using semi-structured interviews as the primary research method. Semi-structured interviews have both advantages and disadvantages as a qualitative research method. One advantage is the flexibility it provides. The interviewer has a set of predetermined questions, but they can also ask additional follow-up questions based on the participant's responses. This allows for more in-depth exploration of topics and the flexibility to follow interesting avenues of inquiry that may not have been anticipated (Kvale, 1996). This suits the nature of this study well, as discussed in earlier sections. The qualitative nature of the interviews will enable broad discussions around the four main factors outlined by Granovetter, but it also allows for in-depth explanation, which will lead to a greater understanding of the network.

The interviews will be mostly conducted online via video calling software such as Zoom or Microsoft Teams. Participants are much more familiar and comfortable with this method than in previous years due to the COVID-19 pandemic and the resulting home-working restrictions. Further discussion on this follows in a later section. In practice, this allows for research on a much wider-reaching basis. For example, interviews can be conducted with individuals nationwide across the UK, but also those based outside of the UK with some responsibility for UK-based operations. Key organisations will be included as a result of this, although an acknowledgement of the different nature of online and in-person interviews should also be acknowledged.

In addition to the interviews as the primary research method, secondary data will be utilised in the form of document analysis. This will introduce reports from retailers to the analysis, which will support the information gathered from the interview to produce a full, detailed picture of the network. A broader discussion around each of these points will be included in the following sections.

3.6.8 Data analysis

The data analysis for this study will consist of two main parts. Initially, the network map will be drawn out for both the wider network and again with each supermarket case as an ‘ego’ or central node in the map. Visualising the network is useful to “get an initial first ‘feel’ for the network” being studied (Prell, 2012, p.83). This map will then be analysed using network analysis. Following this, a thematic analysis will be drawn from the qualitative discussions surrounding the network.

A thematic approach to analysis – where commonly discussed themes are drawn from the data and connected – can be useful in qualitative research to draw understanding from a wide data set and helps the researcher to discover where the connections can be drawn (Aronson, 1994; Braun et al, 2018). It is hoped that the themes will demonstrate some commonalities between each of the data sets which can be strengthened and evidenced using a range of data from across them all. Thematic analysis can also support the hybridity of the data using inductive coding to establish academic rigour in the analysis (Fereday and Muir-Cochrane, 2006).

Combining thematic analysis with social network analysis will assist with telling the wider story of the current UK food waste networks within supermarkets, and how social enterprises fit in. Social network analysis studies social structures and relationships within a network, aiming to identify patterns and understand the wider implications of particular network relationships, or ties (Wasserman and Faust, 1994). Granovetter's theory is a social network theory, thus, social network analysis can be used to analyse the data (Prell, 2012). It examines the relationships between nodes or actors within a network, which could be individuals, organisations, or any other social entity. In this case, the study will focus on organisations and the relationships between them. The analysis may include the study of the types of ties or connections between actors, the strength or quality of those connections, the nature of the information that flows through those ties, and the overall structure of the network. Each of these things will be useful to consider in the food waste network, with a particular focus on the strength of the ties alongside a wider understanding of their nature.

The analysis will be first conducted during the actual data collection phase, furthered during the transcription phase, as reflections and connections begin to materialise. Completed transcriptions will then be printed and interesting points highlighted for future reference.

The transcripts will then be input into NVivo, a data analysis tool which will assist with the processing of the data, arrangement of sources and forming connections between documents which can then be explored further as themes within the data. It is important to note that the software will aid the thought process, not replace it (Weitzmann and Miles, 1995). This is supported by the notion that the researcher determines the results found, not the software (Wiltshier, 2011). NVivo will be used as it allows for the management of a wide variety and volume of data sources which makes it a valuable tool for researchers, with the flexibility within it for the methodology to be adopted based on the researcher's wishes, supported by the software tools.

In the first instance, the transcribed documents will be scrutinised for any common themes, ideas of relevance to the research topic and intricacies worth further exploration. The starting points for developing links and connections between interviews and ideas will be identified and highlighted. This will then form the basis for a more detailed analysis.

The detail will come in the form of a more intricate look at the data in relation to the review of the literature, capturing the key themes within the discussion and connecting them with existing research. This will lead to a fully formed thematic analysis which will be supported by the network analysis.

The network will first be mapped based on the responses to the network-related questions in the interviews. It can be said that “data visualisation is not just illustration but also discovery” (Brandes, Kenis and Raab, 2005), demonstrating how important the visual network map can be for full exploratory analysis. It could also help with looking at the data from a variety of different perspectives (Wiltshier, 2011). The developed model for this (Figure 1) demonstrates how the ‘score’ given to each network tie will be calculated, which will in turn infer a stronger or weaker tie between the two nodes involved. As the network map grows, the analysis can be drawn based on Granovetter’s theory as discussed in earlier chapters, with the overall aim of supporting or refuting the theory. At a sufficient size, the network mapping will also be able to contribute to the thematic analysis, providing useful insights and discussion points. This will be on the basis of how the network ties interrelate, and their differences based on the contextual information surrounding each tie.

The network map will be visualised with traditions in mind. Some common conceptions of network mapping include placing “relevant” nodes closer to the centre (or closer to the connected node) than “less relevant” nodes – the definition of relevancy being determined by the research; arranging connected nodes into clusters to enhance the visibility of groupings and bridging ties; and using visual variables such as colour, size and shape of nodes or node edges to represent differences between node or tie values. In this case, colours and line weight will be used to aid in the visual interpretation of the network map. Cluster nodes could also be used in the analysis, should this be of interest, where a single node represents a number of different individuals or organisations. For example, where larger local networks may exist, they could be represented in this way.

A limitation of this type of analysis is that it does not account for changes in networks over time (Prell, 2012). The participants in the study may discuss a tie with an organisation they no longer work with or plan to work with in future, and whilst this may be of interest, this cannot be easily represented within a network map. The network map will therefore exist as a snapshot of the current situation, acknowledging that whilst changes may be made, any commonalities or key findings in relation to the network can still be relevant due to the comparative nature of the study.

3.6.9 Potential Contributions

Whilst the network map and accompanying analysis provides a useful overview of the ties between organisations, this link to the thematic analysis – making connections between the qualitative, rich, explanatory data and the numbers-based, surface level data – is where this research will situate itself uniquely within the current literature.

Triangulating this with publicly available data and reports will help to situate it in the ever-evolving and current food waste landscape, utilising the angle of social enterprises to further differentiate.

There is a potential impact at the policy level, as climate change, sustainability, emissions reduction, and waste reduction are all key topics for governments globally. Demonstrating how these organisations work together and how they collaborate over a mutually beneficial arrangement will help to demonstrate some best practice to share.

3.7 Ethics

Ethical consideration is an important aspect in the design of any research study, existing to protect not only research participants but also the researchers themselves (Miller and Salkind, 2002). Early research identified three main considerations when conducting responsible research: the treatment of human participants, deception and informed consent (Diener and Crandall, 1978). Since then, the study of ethics in research has developed significantly, although the main purpose continues to be to protect participants by preventing them from harm and enforcing their rights (Wassenaar and Mamotte, 2012). Participants should be given the opportunity to withdraw their data at any time during the research process or withdraw from the study itself at any time. Participants should not be deceived, or physically or mentally hurt whilst taking part in research. In 2008, Emanuel et al (2008) proposed a framework of research ethics based on eight key components, none more important than another: collaborative partnership, social value, scientific validity, a fair selection of participants, favourable risk-benefit ratio, independent ethical review, informed consent and ongoing respect for participants and study communities (Emanuel et al, 2008). This framework is considered to be fairly comprehensive, encompassing the key ethical considerations in social science research (Wassenaar and Mamotte, 2012).

3.7.1 Validity and reliability

In the measurement and collection of data, the quality of the data can be determined on the basis of its validity, reliability, and replicability; each of these is measured differently in qualitative and quantitative research. These factors are important to consider early on in the process of any research design in order to mitigate potential issues which may arise.

In qualitative research, validity is concerned with the applicability of the research beyond the sample used in the study and the potential for generalisation across populations (Della Porta, 2008). For quantitative research, validity is defined as the extent to which the concept being investigated is accurately measured (Heale and Twycross, 2015), and different authors discuss validity using categorisations such as internal and external validity; construct, content, and criterion validity; and convergent and divergent validity (Roberts et al, 2006). In addition, for both qualitative and quantitative research, reliability is concerned with how much trust can be placed in the results of a study. Where it would be difficult to repeat steps to obtain the same outcome, this raises concerns about reliability, and the study's integrity can be questioned (Gerring, 2001). Therefore, being explicit about the design and methodology of a study is helpful in achieving both validity and reliability in research.

The key validity and reliability factors to take into account for this design are likely to include the decisions around sampling methods and the size of the sample. Expert sampling faces criticism for the level of human influence in choosing respondents, yet in this instance, in order to make effective comparisons, a representative sample is required from each sub-group, and quota sampling helps to ensure that this is the case. The sample size in terms of qualitative research is still a hotly debated topic due to the difficulty relating findings to larger populations, and as Pratt (2008) analogises, publishing qualitative research can be like "fitting oval pegs into round holes" (p.481), in that qualitative research faces more criticism than its quantitative counterpart prior to publishing, with many reporting comments around sample size. In this research, qualitative case studies are used as a way of further developing an understanding of an area, thus the need for justification around sampling methods and transparency in the research design.

Selection bias, where the results are altered as a result of sampling (Henderson and Page, 2007), can occur as a result of using these sampling methods. This can be aided by using a theory of selection (Berk, 1983), a rigorous procedure to follow in determining participants. Being explicit in how the sample was chosen and justifying sampling decisions (including reasons for any case exclusions) appropriately can assist in ensuring the representativeness of the sample and the validity of the research as a whole.

Additionally, interview bias can occur in a number of ways throughout the research process. Bias in qualitative research should be viewed differently from that of quantitative, as interpretation and understanding, which is the purpose of qualitative research, will always be applied in data collection and analysis (Qu and Dumay, 2011). However, it is still of great importance to apply interpretations in an unbiased way, using the data to drive the interpretations which can then be fully justified and explained.

3.7.2 Using human participants

In this study, there will be no requirement for deception of any kind and fully informed consent can be taken from each participant. Human participants are free to participate and withdraw at their own will, and full briefing information will be sent in advance of any research conducted (see appendix 2). The fair selection of participants will be important to consider in this design given the small sample size and quota method of sampling.

All participants will be able to personally provide informed consent to participate in the study. This will include verbal and written consent taken face-to-face for any interviews conducted in person and recorded verbal consent and written consent

(sent via email) for telephone or video interviews which may take place (which will be the most likely approach used) (see appendix 3).

Full briefing information will be given to the participants prior to the data collection point via email so that they are able to read it in advance of the interview, and paper copies will be provided in person. This will provide full, detailed information about the nature of the study, the purpose and clear connections to their own relevance to the research. As these are semi-structured interviews, there may be follow-up questions added.

As part of the consent process, participants will be informed of their right to withdraw during the consent phase of the research, either verbally and/or on the information sheets for the interviews. Participants will be given a set time period within which to withdraw, after which I will begin the analysis and their data becomes more difficult to remove. Every participant will be given a minimum of two weeks to withdraw their data from the study, but most will have more time than this.

If a participant decides to withdraw their data from the study, all information will be removed and all records destroyed, as long as it is within the defined period for withdrawal. There will be no consequences for the participant. Should a participant wish to withdraw at a later date, all efforts will be made to do so, but no guarantee will be made following the start of the analysis phase.

4.0 RESEARCH PARTICIPANTS

4.1 Collecting data

The research questions were investigated as outlined in the methodology chapter and as replicated below, primarily using semi-structured interviews. The data collection process was executed following a robust planning stage, which assisted with gaining a high standard of data and interviews from the respondents. Questions were asked according to the interview schedule in the following section. Where further data could be gathered within the themes of the research questions, the interviewer was able to expand upon the questions accordingly to enable further elaboration and greater understanding. This chapter will highlight various themes which emerged from the interviews, grouped according to the research questions. These themes will be triangulated with document analysis from secondary sources and with existing literature to assess the networks surrounding food waste in the UK and their relative strength, applying Granovetter’s theory to better understand the characteristics of these network relationships.

4.2 Interview schedule

The interview schedule was developed using an iterative, abductive approach. Questions were written and tested using interviewees which were not included in the sample. Further minor adjustments were made throughout the process of interviewing the participants, as a result of utilising the semi-structured interview approach. Slight adjustments were made based on the type of interviewee (supermarket, social enterprise or government), but with consistencies where needed in order to understand the relationships. The question lists are included in Appendix 4.

4.3 Sample

Data was collected from eight social enterprises, three retailers, five representatives from the local and national government and one additional organisation, an NGO which provides broader context within the network. This range of interviewees has provided a useful insight into the network, its operations, and its intricacies, which will be discussed in detail within this section. They were selected primarily using expert and convenience sampling, followed by snowball sampling.

The addition of other organisations beyond the main scope of the research was important, and came about as part of the data collection phase. As participants were discussing their networks, certain organisations were mentioned frequently as being key network contacts, sometimes facilitating the links between social enterprises and retailers, and so, for a complete network picture, it was considered necessary to include them as interviewees.

As described in the methodology section, snowball sampling was used as a primary source of participants, in addition to online web searches for potential contacts, and reaching out directly via email or via the professional social network, LinkedIn. Due to the nature of network research, snowball sampling, where participants recommend or facilitate contact with other potential participants, is well suited to this kind of research (Heckathorn and Cameron, 2017) as it involves utilising their network contacts. Whilst some participants gave names and email addresses for their contacts, others were copied into email communications – both with varying degrees of success. Solely using snowball sampling, however, requires participants to be able to recall all of their contacts on demand (Von der Fehr et al, 2018), and so it has been important to triangulate the information using online research and by following up with any participant should another contact disclose a relationship with them.

Unfortunately, some network contacts could not take part, either not responding to attempts to contact them, or due to their busy workloads, they were unable to find the time. Where possible, one-way network ties were analysed, or the tie at least noted on the network map. This enabled their inclusion in the wider network map despite lacking more detailed information on their network ties.

Overall, a qualitative sample of 17 individuals have contributed to this research, their responses used throughout the following analysis to support the themes developed from the transcripts, and triangulated with data from online reports and company websites.

They are listed below, and allocated numbers for ease of reference throughout the analysis.

Table 4A: Primary data - interview participants

Interview number	Organisation	Role of interviewee	Type of organisation
1	Tesco	Supply Chain Analyst	Supermarket
2	Morrisons, Whitefield store	Community Champion	Supermarket
3	Midcounties Co-op	Community Funder	Supermarket
4	Fareshare	Public Affairs, Policy and Campaigns Consultant	Social enterprise and charity
5	Fareshare Greater Manchester / Emerge	Membership and Information Coordinator	Social enterprise and charity
6	DEFRA	Senior Policy Advisor	Government
7	Greater Manchester Combined Authority	Public Service Strategy Reform	Local council
8	Greater Manchester Combined Authority	Head of Sustainable Consumption and Production, Environment Team	Local council
9	Action Together, Rochdale	Neighbourhood Facilitator	NGO
10	Rochdale Housing Association	Surplus Food Coordinator	Local council
11	Stockport Homes	Food Project and Your Local Pantry Coordinator	Local council
12	The Bread and Butter Thing	CEO	Social enterprise
13	Olio	Head of Impact	Social enterprise
14	Too Good To Go	Regional Lead	Social enterprise
15	Lighthouse Project,	Volunteer, helped to set	Social enterprise

	Middleton	up the food pantry	and charity
16	Cracking Good Food, Manchester	Project Manager	Social enterprise and charity
17	Open Kitchen MCR	Former employee	Social enterprise

The information gathered from the interviews is triangulated with secondary data sources such as sustainability reports and impact reports. The list of the sources used in the analysis is below, with an accompanying letter reference to be used to refer to the source throughout the analysis.

Table 4B: Secondary data - additional sources used.

A1	Tesco	Factsheet - Food waste and redistribution 2022	Supermarket
A2	Tesco	Annual Report 2023	Supermarket
B	Morrisons	Sustainability report 2021	Supermarket
C	Coop	Co-operate report 2021	Supermarket
D	Midcounties Coop	Climate Action Report 2021	Supermarket
E	Fareshare	Annual Report 2021/22	Social enterprise and charity
F	The Bread and Butter Thing	Impact Report 2022	Social enterprise
G1	WRAP	The Food Waste Reduction Roadmap - Progress Report 2021	NGO
G2	WRAP	The Food Waste	NGO

		Reduction Roadmap - Progress Report 2022	
H	WRAP	WRAP Food waste measurement roadmap - 2020 guidelines	NGO
I	UN Environment Programme	Food Waste Index 2021	NGO
J	Champions 12.3	2022 Progress Report	NGO
K	Too Good To Go	Impact Report	Social enterprise

Combining these data sources will enrich the analysis and provide some meaningful insights into the data gathered as the research questions are answered within this section.

4.4 Analysis of the data

This section will explain the process which was undertaken to analyse the data in this research.

The data was first transcribed from the recorded audio file, as per the conventions outlined earlier. Each interview was then printed and highlighted – for each response which contained a relevant link to a research question or proposition, this was highlighted. This would then be coded into NVivo, which helped with the identification of key themes. It also helped with the formulation of the network map, as having the information easily accessible meant that the connections were easier to identify.

Figure 4A: Image of highlighted interview.

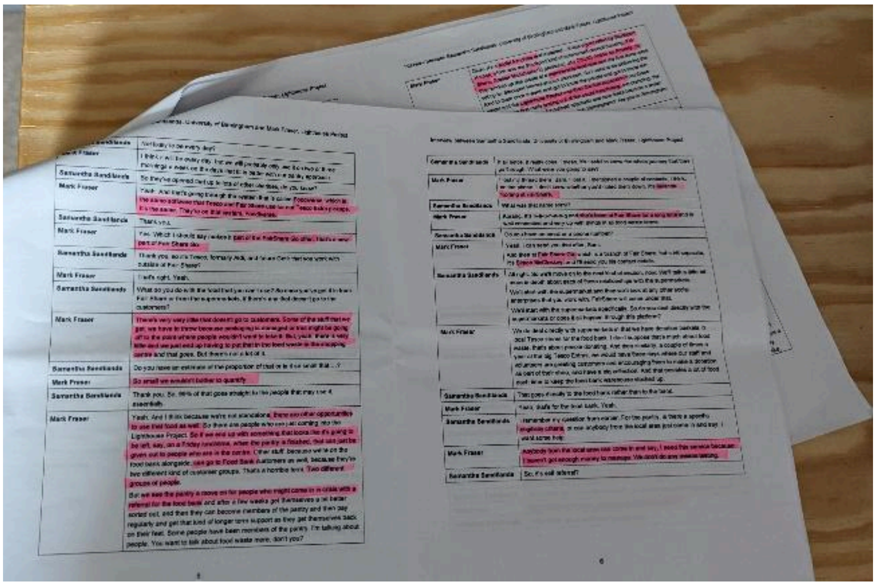


Figure 4B: Screenshot taken during the process of coding and categorising the data in NVivo. (NB. Names have been obscured for anonymity).

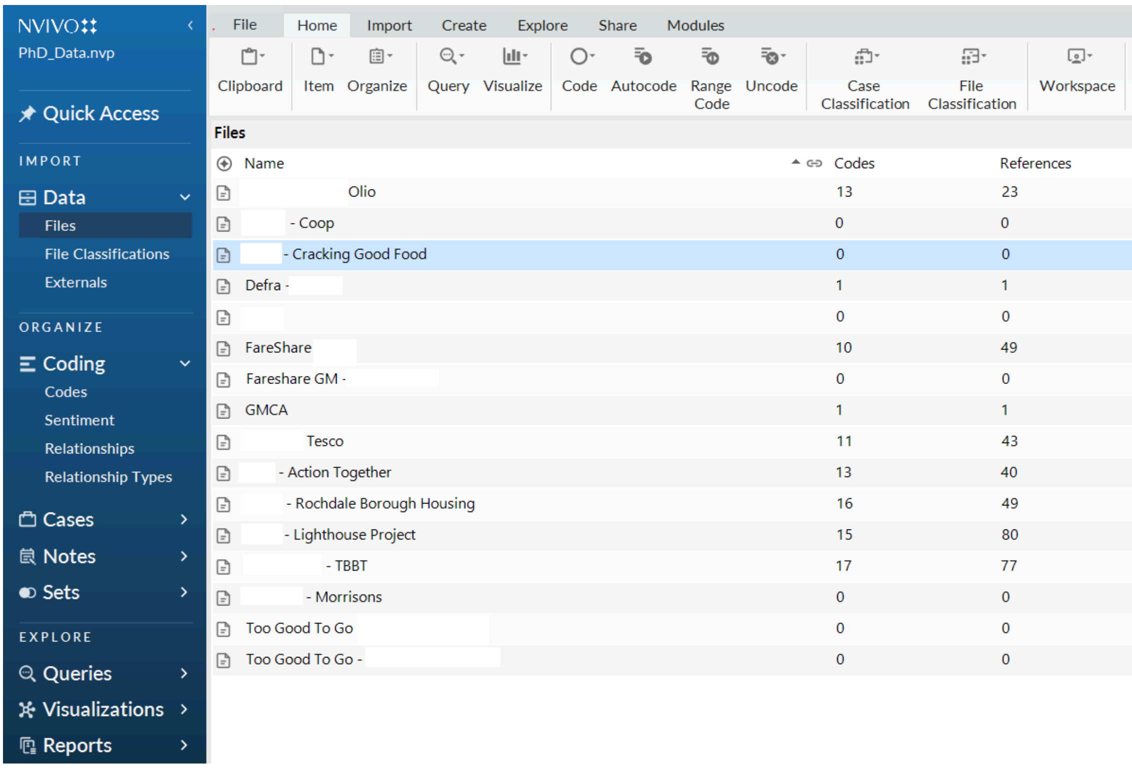
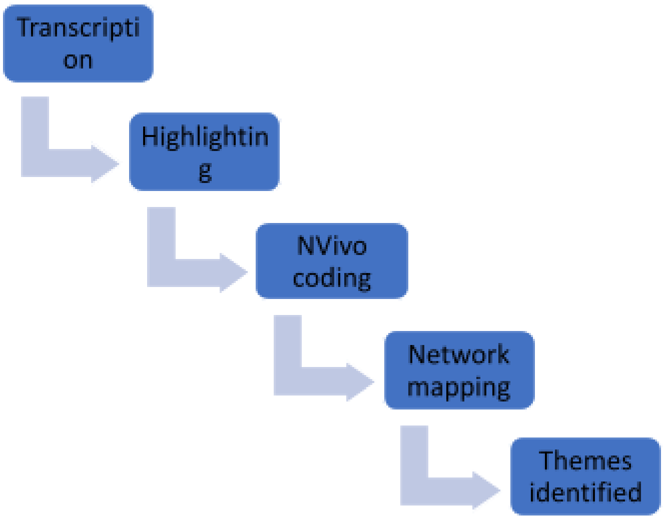


Figure 4C: Visual representation of the process of data analysis.



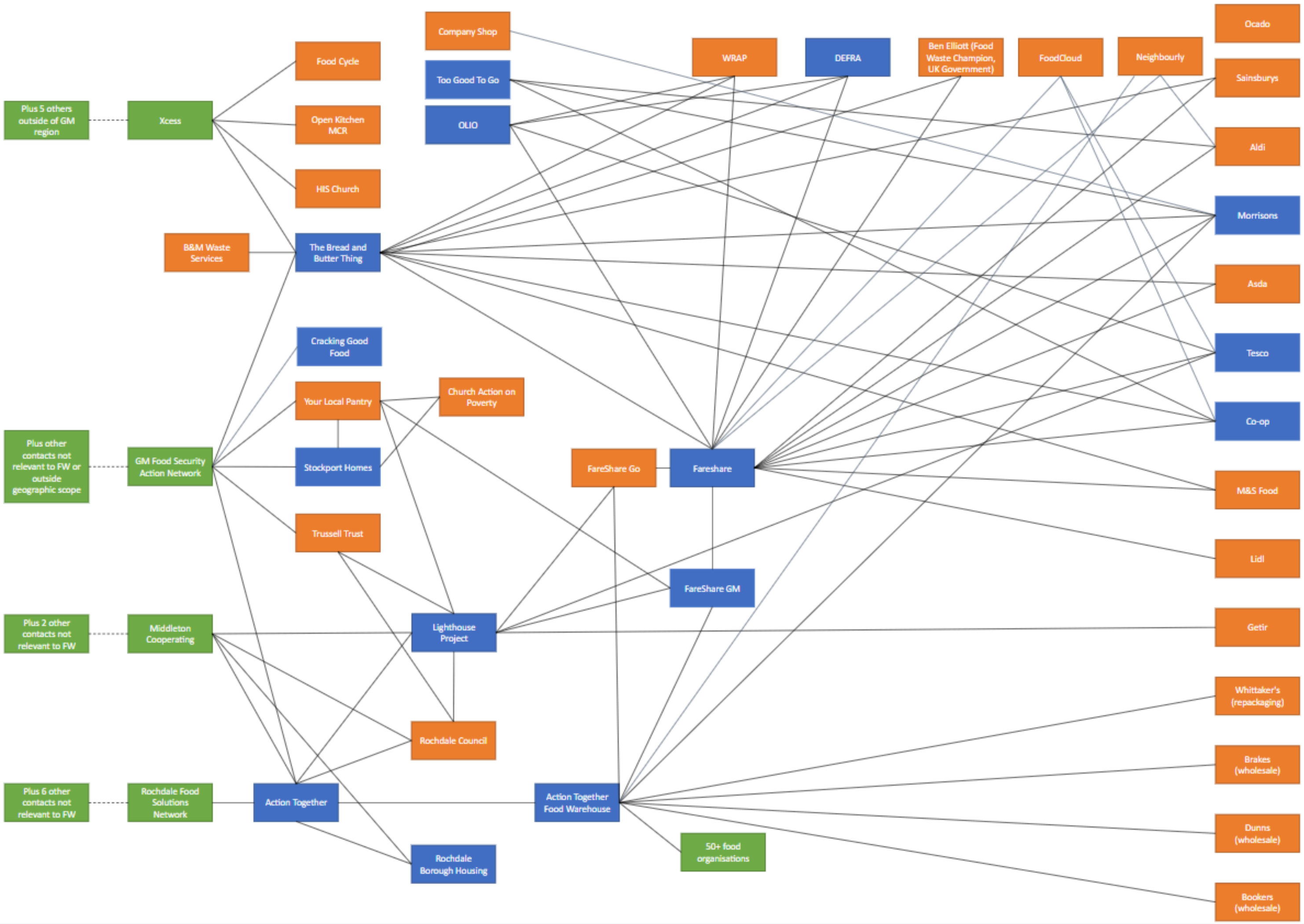
4.5 Network mapping

Granovetter's theory is a social network theory, thus, social network analysis can be used to analyse the data (Prell, 2012). "The analysis of networks tends to focus on complete network data" (Prell, 2012, p.86) which can be focused on the ego level or actor level. This can be done using a visual tool to demonstrate the ties, both in the form of a large overall network map and also a smaller-scale ego-centric network for each of the case studies.

When developing a network map, what we would expect to see is a "large mass of ties criss-crossing one another" (Prell, 2012, p.83). This can present a challenge in the ability to present the data in a way which can be interpreted and understood by the reader. Displaying network data in a visual or digraph can help with this, using visual cues to support the ease of understanding. This can include the size of the node to signify how many ties are connected to it, the weight of the line to signify the strength of the tie, or groupings (using different symbols and/or colours) by discipline, category or particular attribute of the node. This can “help one develop a better interpretation or visual story about what is happening in the network, and inspire what kind of additional analyses you would like to perform” (Prell, 2012, p.85).

The network map below in Figure 4D shows the relationships between the different network nodes of those interviewed as part of the study (and some beyond the interviewees where sufficient secondary data was available).

Figure 4D: Full network map demonstrating the complexity of food waste management.



4.6 Explaining the network

Even at first glance, it is clear from this map that the network is highly complex with many ties within it. This supports the expectations from Prell (2012) discussed in section 4.4.

Colours were utilised within this network map to indicate the type of organisation, which assisted with the visualisation of the network. Those in green signify networks which exist within the network, which contain the nodes on the map plus others which were less relevant to this analysis, either due to the type of organisation or their lack of other network links with, for example, supermarkets. Those in blue are those who have been interviewed as part of this study. Those in orange are other key network nodes, which have not been interviewed as part of the study, largely due to access but in some cases, they were not relevant to the three identified cases.

What this map clearly demonstrates, is the volume of relationship ties within it, particularly where there are key nodes which utilise many ties. For example, Fareshare has far more ties than any other in the network, situating them well to be able to provide some insight. The Bread and Butter Thing operates largely in the north of England and again represents a node with a large number of ties in this network. These two key organisations will be significant in identifying any patterns, similarities and differences across the cases.

The network map shows an overall unclear picture of how food waste is managed, and therefore, in order to better understand the processes involved, the network will highlight three key cases, and analyse them in greater detail. These cases will focus on individual supermarket nodes, enabling a more detailed insight into how these supermarkets manage their food surplus and waste.

4.7 Emerging themes

A number of themes emerged during the data collection, which will be discussed in more detail throughout the following sections. The themes were identified as a result of working through the data, examining any recurring topics, and discovering where there were patterns or connections relating to my research questions occurring between multiple interviews. Granovetter's theory helped in identifying the initial four themes which the questions were based around, and which will be the starting point for the discussion. This then leads to other emerging themes which were identified inductively. The themes to be discussed are: time, reciprocity, mutual confiding and emotional intensity from Granovetter, followed by discussions on the food waste hierarchy, barriers within network relationships, the motivations behind the development of relationships for different nodes, the impacts of both financial involvement and technology on the network relationships, and finally network effectiveness. The research questions are as follows, and are answered throughout this section.

1. Are UK supermarkets' food surplus networks comprised of **both strong and weak ties** with social enterprises, governments and other supporting organisations?
2. How do the strong and weak ties within the network effectively enable social enterprises to assist in managing supermarket food surplus, and how does this align with the **food waste hierarchy**?
3. Do **social enterprises** form a key component of UK supermarkets' food surplus networks?
4. Are there any key **facilitating factors** to support the effectiveness of managing food surplus, and do they differ between strong and weak ties?
5. Are there any **barriers** to the effectiveness of managing food surplus, and do they differ between strong and weak ties?
6. What are the key **motivations** of food waste reduction stakeholders to partake in the network?

5.0 CASE ANALYSIS

The study focused on three main cases, each around a different UK supermarket chain - Tesco, Morrisons and Co-op. Each of these cases will be discussed here in detail, using the research questions as a basis for the discussion. This will be followed by a cross-case analysis and further discussion which identifies commonalities and differences between the cases and how the three supermarkets operate.

5.1 Case study 1: Tesco

5.1.1 Introduction

Tesco is an international supermarket, operating in five countries. Its operation in the UK is by far the largest, with over 4,000 stores nationwide (out of 4,700) (Statista, 2023; Global Data, 2023). It holds the largest market share of UK supermarkets, currently, as of April 2023, around 27% (Kantar, 2023). Tesco primarily sells food but also sells other items such as toiletries, electronics, home decor, toys and games. It operates stores of varying sizes, from the largest Tesco Extra stores, which stock a wider variety of both food and non-food items, down to much smaller Tesco Express stores which are generally focused on convenience foods.

Tesco purports to have a strong focus on sustainability issues and publishes its audited waste and sustainability figures each year. Specifically, it has now tied its CEO's bonus to the company's food waste reduction targets (Retail Gazette, 2022), and has been identified as a leader in this field as a result. As of May 2022, Tesco claims to have reduced its food waste (as a percentage of food handled) by 45% since 2016 (Source A1, Tesco, 2022). In order to do this, Tesco utilises a hierarchy approach to redistributing their food surplus, which aligns with the WRAP and other similar hierarchy models as discussed in Chapter 2.1. They also demonstrate a commitment to working with their supply chain networks - both upstream to their suppliers and downstream to consumers - in order to contribute to the wider UN Sustainable Development Goal 12.3 (Source A1, Tesco, 2022). Tesco differentiates between food waste and food surplus, defining any food which is sent for human or animal consumption as 'surplus' and anything sent for anaerobic digestion as 'waste'. Other hierarchy levels such as composting and landfill are not included, as Tesco do not utilise these options with them being further down the hierarchy than anaerobic digestion (Source A1, Tesco, 2022). This is an important differentiation when it comes to defining KPIs and targets for food waste reduction, as they may not include donations to charities, FareShare, OLIO and Resource Food as waste when considering their food waste data.

Table 5A below shows the 2021/22 data from Tesco stores and distribution centres, highlighting the volumes of food waste which are redistributed at each level of the food waste hierarchy. Tesco breaks down the 'Feeding Hungry People' level into further detail, as it differentiates between charity giving, giving to OLIO, and distribution to colleagues. This first table shows this level holistically, so that a comparison can be drawn in line with the hierarchy, and is broken down into component parts (e.g. Olio, charity etc) in Table 5B. For context, the total tonnage of Tesco's UK food surplus for 2021/22 was 81,222 tonnes (Source A1, Tesco, 2022).

Table 5A: Food waste and surplus redistribution by levels of the food waste hierarchy (Source A1, Tesco, 2022).

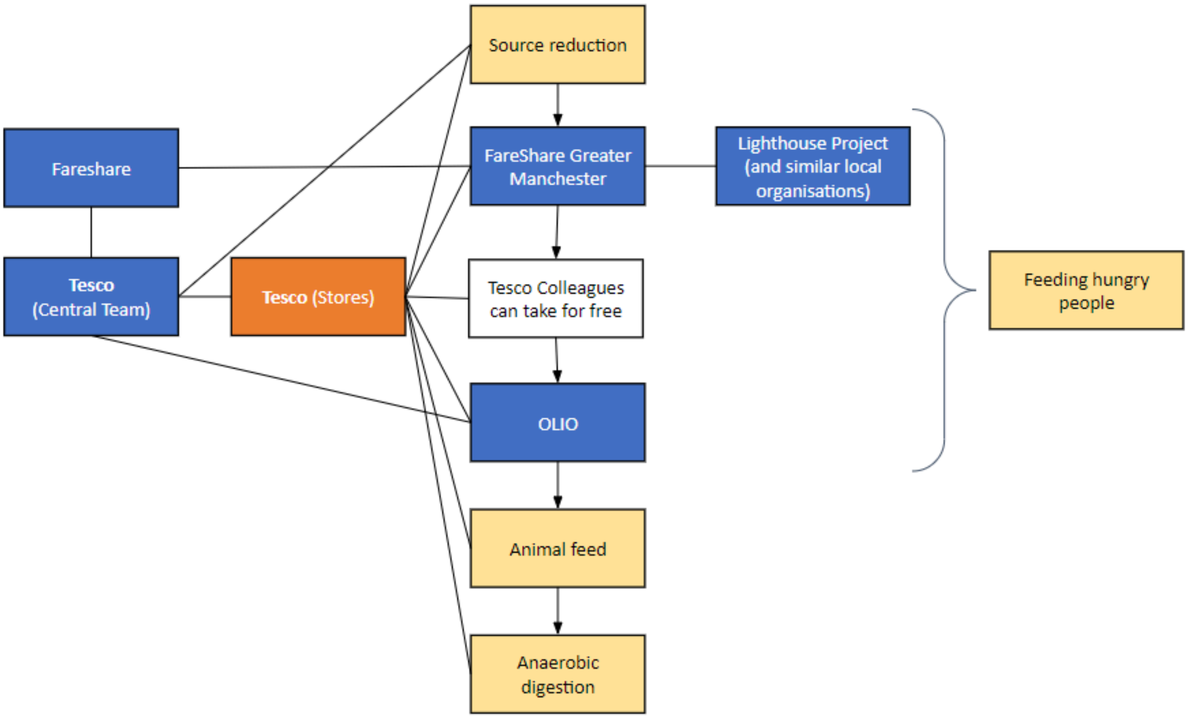
Hierarchy level	**Food waste redistributed (in tonnes)**	**Food waste redistributed (as a % of overall waste)**
Source Reduction*	2,902	N/A
Feeding Hungry People	25,473	31.4%
Animal Feed	22,933	28.2%
Anaerobic Digestion	32,816	40.4%

**Source reduction was calculated by comparing the total amount of unsold food in 2020/21 to 2021/22.*

Table 5A almost demonstrates the inverse of the food waste hierarchy in terms of proportions. It begins by showing the lowest overall figure in source reduction at the top, and higher numbers at both 'feeding hungry people' and 'animal feed' levels, which are relatively comparable. This number then increases again for anaerobic digestion, demonstrating an almost inverse approach than would be expected when using the hierarchy.

The network map below shows the hierarchical order utilised by Tesco, in line with the sections of the food waste hierarchy (see Chapter 2.1), which are highlighted on the map here in yellow.

Figure 5A: Tesco network map demonstrating their alignment with the food waste hierarchy.



This network map highlights the focus that Tesco has on food redistribution to other people where possible. Whilst we can see from Table 5A above that the hierarchy is somewhat inverted in terms of quantities, they do demonstrate a commitment to their attempts at redistribution to both people and to animals by following this order, and by continuously attempting to increase their donations at these levels.

Tesco has a supply chain team which focuses on optimising the volumes of food which is delivered to each distribution centre, and then store. Source reduction is actioned within this team, as they aim to balance the provision of sufficient stock levels with lower levels of waste (Interview 1, Tesco). This process is largely automated based on stock levels and forecasting based on figures from previous years, market trends and a large amount of data, with some input from the supply chain team where required.

Feeding Hungry People is where Tesco tries to focus its efforts on food surplus redistribution. Table 5B below breaks down this level of the hierarchy into the three strategies utilised by Tesco to get surplus food to people whilst it can still be consumed.

Table 5B: Food waste and surplus redistribution at the Feeding Hungry People level of the food waste hierarchy (Source A1, Tesco, 2022).

Redistribution strategy	**Food waste redistributed (in tonnes)**	**Food waste redistributed (as a % of overall waste redistributed to people)**	**Food waste redistributed (as a % of overall waste)**
Charities	11,671	45.8%	14.4%
Colleague Shop	9,260	36.4%	11.4%
OLIO	4,542	17.8%	5.6%

This table demonstrates the redistribution of surplus food to people - showing that the majority of the food which is redistributed goes to charities. Tesco works nationally with two key organisations for food surplus redistribution – FareShare and Olio. These relationships are managed centrally on behalf of all stores in the UK. In addition to this, stores can work independently with local organisations to support their communities. Many of these relationships are managed through FareShare, but others are arranged directly with the stores themselves. Tesco claims to have supported over 3,900 local organisations through their stores (Tesco, 2022). The Colleague Shop comes in between these two, which is a scheme for staff members to take the surplus food free of charge. This is recorded as it still goes through the main till system, but when a staff member scans their Clubcard, it is reduced to zero cost. This allows Tesco to keep track of this option.

The order in which Tesco prioritises food redistribution is the same as that shown in Table 5B. Firstly it is offered to charities (including Fareshare), then to colleagues, then finally to OLIO, whose network of Food Waste Heroes will then work to collect and redistribute it on a smaller scale than what charities can often do (Tesco, Interview 1). This is illustrated and explained in more detail later in this case analysis.

For animal feed, the store colleagues sort any leftover produce into different coloured bags on the basis of the type of product, which is then sent to the animal feed organisation they work with – Resource Food, based in Rugby. Tesco sends the bagged waste straight to the processing plants, where it is checked for contaminants before being turned into mulch. There are strict criteria for what can be sent for animal feed, and it is the responsibility of store colleagues to ensure that what goes in the bags adheres to these criteria. For example, it must be free from mycotoxins and any chemicals which could harm the animal, or indeed the humans who may consume the animal later down the line, so things like pesticides should be limited. Anything which is rejected, either from the store level or at the animal feed plant, then gets sent to anaerobic digestion and converted to energy.

For anaerobic digestion, Tesco appears to use multiple providers rather than having a closer partnership with a single anaerobic digestion organisation. Limited information is available on how this level of the hierarchy operates other than the recording of the tonnage, which is sent to be processed in this way. As this study focuses more on the food redistribution stage of this process, further questions were not asked about this arrangement.

In summary, Tesco appears to operate with a number of organisations in different ways to work towards food waste and surplus reduction. In some cases, such as animal feed and with partners such as FareShare and OLIO, these relationships operate nationally and are managed centrally on behalf of the stores. In other cases, such as individual charity partners and for anaerobic digestion, the approach relies on stores or regional areas to manage them. This approach allows Tesco stores to work with their local communities where appropriate but also gives other options to enable them to effectively operate their zero waste to landfill policy but also to work towards redistribution at earlier stages of the hierarchy to reduce waste levels overall.

The interviews which are core to this case are Tesco (Interview 1), Fareshare (Interview 4), Fareshare Greater Manchester (Interview 5), OLIO (Interview 13) and local organisations including Lighthouse Project and Cracking Good Food (Interviews 15, 16, 17). Later in the case when the wider network is discussed, supporting discussion will be included from DEFRA (Interview 6), and representatives from local government organisations and NGOs (Interviews 7, 8, 9, 10 and 11). This is triangulated using secondary sources (Table 5D) including annual reports, sustainability/CSR reports, policy documents and other market analysis sources. This information is summarised in Table 5C below, with the core organisations which form the food surplus supply chain highlighted.

Table 5C: Interviews used in the analysis of the Tesco case study.

Interview number	**Organisation**	**Role of interviewee**	**Type of organisation**
1	Tesco	Supply Chain Analyst	Supermarket
4	Fareshare	Public Affairs, Policy and Campaigns Consultant	Social enterprise and charity
5	Fareshare Greater Manchester / Emerge	Membership and Information Coordinator	Social enterprise and charity
6	DEFRA	Senior Policy Advisor	Government
7	Greater Manchester Combined Authority	Public Service Strategy Reform	Local council
8	Greater Manchester Combined Authority	Head of Sustainable Consumption and Production, Environment Team	Local council
9	Action Together,	Neighbourhood Facilitator	NGO

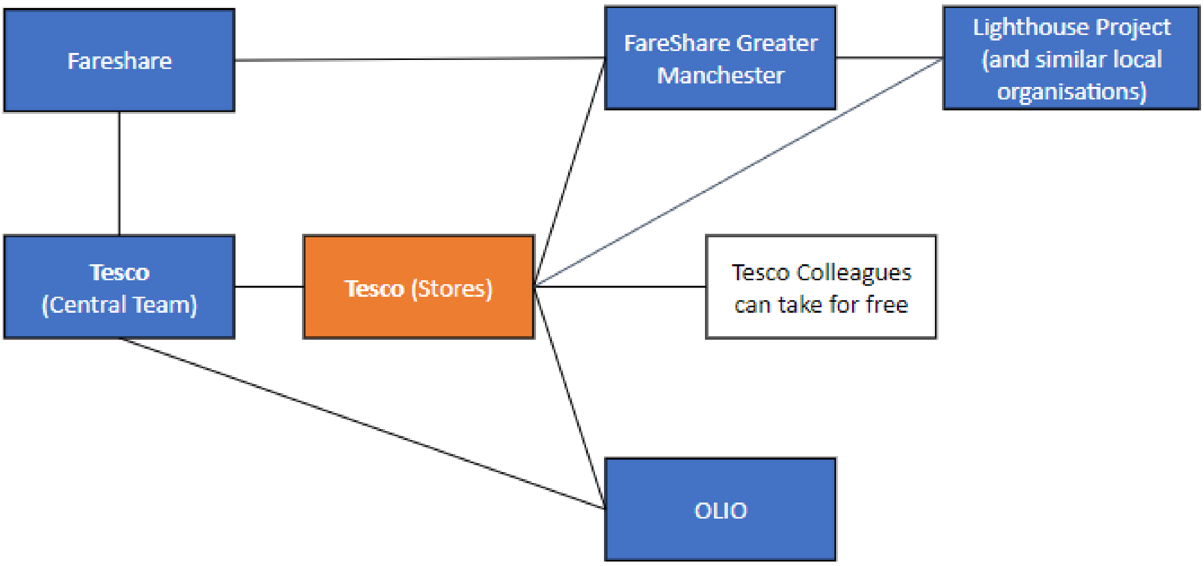
	Rochdale		
10	Rochdale Housing Association	Surplus Food Coordinator	Local council
11	Stockport Homes	Food Project and Your Local Pantry Coordinator	Local council
13	Olio	Head of Impact	Social enterprise
15	Lighthouse Project, Middleton	Volunteer, helped to set up the food pantry	Social enterprise and charity
16	Cracking Good Food, Manchester	Project Manager	Social enterprise and charity
17	Open Kitchen MCR	Former employee	Social enterprise

Table 5D: Secondary sources used in the analysis of the Tesco case study.

A1	Tesco	Factsheet - Food waste and redistribution 2022	Supermarket
A2	Tesco	Annual Report 2023	Supermarket
E	Fareshare	Annual Report 2021/22	Social enterprise and charity
G	WRAP	The Food Waste Reduction Roadmap - Progress Report 2021	NGO
H	WRAP	WRAP Food waste measurement roadmap - 2020 guidelines	NGO
I	UN Environment Programme	Food Waste Index 2021	NGO
J	Champions 12.3	2022 Progress Report	NGO

For the Tesco case study, the network map will first be explored, and analysed in relation to Granovetter's strength of weak ties theory. Each relationship tie will be qualitatively assessed based on the interviews which have taken place. The network map in Figure 5B shows the 'supply chain' of food surplus which originates in Tesco stores.

Figure 5B: Network analysis of a single supply chain with Tesco as the key node.

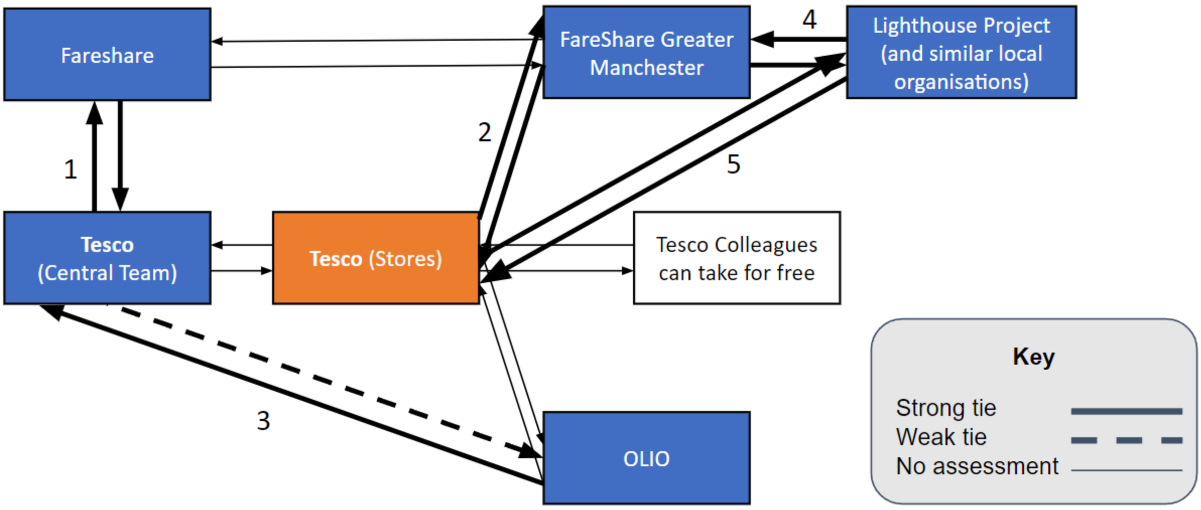


5.1.2 Analysis of research question 1

1. Are UK supermarkets' food surplus networks comprised of **both strong and weak ties** with social enterprises, governments and other supporting organisations?

In Figure 5C below, the network map has been modified to show the strength of the ties between each of the nodes, in both directions. This helps to illustrate where there are both strong and weak ties in the network, and also any differences in perception between the two nodes. Where no assessment has been made, this is due to both nodes being within the same organisation, or the tie between the organisations has already been assessed within the network.

Figure 5C: Network map showing directional strong and weak ties between the network nodes.



Food is redistributed by Tesco stores on the day that it is going to expire based on its best-before or use-by date. Tesco utilises the hierarchy of its redistribution options as described in section 5.1.1, and moves through the hierarchy based on the time of day. On the best-before or use-by date, from 6 p.m. a text message goes out to charities through FareShare Go, a technology platform which facilitates this exchange. Charities have until 9 p.m. to take the food, at which time it is offered to colleagues, and any left after this is offered to Olio's Food Waste Heroes. Some Tesco stores employ a Community Champion, especially in larger stores, who support this process as part of their role (Tesco, 2022). Each of these relationships is further discussed in this section, and is summarised in a table at the beginning of each section. Each of the relationships in Figure 5C, are expanded upon in this section. This discussion considers the relationships from both organisations' perspectives.

5.1.2.1 Tesco and Fareshare

Table 5E: Summary of tie strength between the Tesco and Fareshare nodes.

Tie	Time	Emotional intensity	Mutual confiding	Reciprocity	Overall
Tesco - Fareshare *Relationship 1*	**Low/Medium** The operational aspect runs smoothly so less time is required, but time is spent on data sharing, relationship building, learning etc.	**High** Relationship has been in place for 10 years and they trust them as partners. They would seek advice from them if required.	**High** Lots of data is shared in both directions to facilitate accurate reporting. Tesco suggests that this information is confidential.	**High** Tesco donates food to them and Fareshare will visit to share best practice and ideas.	**Strong**
	Evidence Time is spent between Tesco and Fareshare in relationship building and working together on initiatives such as the annual Winter	**Evidence** *"Tesco's was very first off the bat when it came to trying to tackle food waste. The relationships have been very much long in the making*	**Evidence** *"We are externally audited for this because we have financial targets against it and everything. We hired Deloitte to come in at*	**Evidence** *"We give food to them and stuff, but they've come into Tesco's directly and talked about their organisation, what they do, and how*	

	Food Collection (Fareshare, 2022) and the Give Back Express (Tesco, 2022), both aimed at boosting food donations over the Christmas period.	*and they've gone pretty well, so far." (Interview 1, Tesco).* *"[The Corporate Responsibility] Committee approved an additional £1m donation in support of FareShare and The Trussell Trust throughout the winter period" (Source A2, Tesco).*	*the end of every year and say, okay, did we actually do what we said we did? Tesco loves to quote – so if we say we donated 2 million meals this year, we have to make sure that's actually backed up." (Interview 1, Tesco).*	*they try and manage food waste" (Interview 1, Tesco).*	
Fareshare - Tesco *Relationship 1*	**Low/Medium** The operational aspect runs smoothly so less time is required, but time is spent on data sharing, relationship building, learning etc.	**High** Relationship has been in place for 10 years and they trust them as partners and are FareShare's largest supplier. They would seek advice from them if required.	**High** Lots of data is shared in both directions to facilitate accurate reporting	**High** Tesco donates food to them and Fareshare will visit to share best practice and ideas.	**Strong**

	Evidence *"Tesco is definitely our biggest partner." (Interview 4, FareShare).*	**Evidence** Following the 2022 Winter Food Collection event, Fareshare released a video thanking Tesco and its customers for their donations, including a message from Lindsay Boswell, the CEO of Fareshare. In the video, he says a big thank you to Tesco, stating "this is genius, guys, you're amazing" (Fareshare, 2022). This is a demonstration of trust between the two organisations. *Figure X: Screenshots from the 2022 video from*	**Evidence** *"We have reports going to and back from FareShare saying this is how much we think we've donated to you. It's always 'think', because it's never quite accurate. And they send back this is how much you actually donated to us." (Interview 1, Tesco).*	**Evidence** *"The partnership with FareShare is a core element of Tesco's Little Helps Sustainability Plan to both reduce food waste and support local communities and during the last eight years has redistributed more than 100 million meals to almost 20,000 charities and community groups across the UK. Quite simply, FareShare could not do what we do without Tesco's incredible support!" (Fareshare, 2023).* *"Our work with Tesco demonstrates how the retailer has taken*	

		Fareshare, thanking Tesco for their work.  		*a pragmatic and proactive approach to maximise surplus food distribution across all parts of their operation, creating a huge social benefit to communities across the UK." (Fareshare, 2023).*	

Tesco and Fareshare work closely together and from the data gathered, these can be assessed as ***strong ties*** in both directions. There is evidence to support this across several of Granovetter's four factors, and both describe each other positively. This is summarised in Table 5E.

Whilst the top-level relationship between the two is established at the national level, the smaller, local hubs operationalise the relationship and make it all happen. For this to work effectively, the local hubs and the national organisation are in constant communication and ensure that everything is running as agreed. The local relationship is analysed further in section 5.1.2.3, with the community organisations.

5.1.2.2 Tesco and Olio

Table 5F: Summary of tie strength between the Tesco and Olio nodes.

Tie	Time	Emotional intensity	Mutual confiding	Reciprocity	Overall
Tesco - Olio *Relationship 3*	**Low** Not a lot of time is required to be spent on it, because it now works so smoothly. This is highlighted as a positive, and that if too much time was spent on it, it would	**Low** Tesco appreciates the relationship they have with Olio but prioritise charities/local community organisations first. This relationship has been in place for	**Low** Little requirement for sharing any confidential information.	**Low** Tesco have many options when it comes to food waste redistribution and have placed Olio as a last priority, preferring to support charities over Olio as	**Weak**

	likely be due to issues within the relationship.	three years, since August 2020.		a ‘for-profit organisation’.	
	Evidence *“Basically when the store closes, whoever the Olio champions are at that store takes it. They take it home, and they just put it on the app and then give it away that way.” (Interview 1, Tesco).* It requires little time on Tesco’s part other than adding the food to trays and communicating to the ‘Food Waste Hero’ how many trays are available to collect (OLIO, 2023).	**Evidence** *“They are partners and generally we have very good compliance across all our partners.” (Interview 1, Tesco).* *“Generally we tend to aim for charity first, and then Olio. It's quite interesting because Olio is a for-profit organisation. So we obviously prefer it to go to charities.” (Interview 1, Tesco).*	**Evidence** Interviewee stated this lack of requirement. They share data and statistics between them but this is then made public so is not confidential (Interview 1, Tesco).	**Evidence** *“In 2019, Tesco started looking for ways to up the amount of surplus they could redistribute, on top of what they were already doing through their partnership with FareShare and its national network of charities.” (Olio, 2023).* *“FareShare charities collect Tesco’s surplus in areas where there is enough charity coverage. Wherever*	

				charities are unavailable, have to cancel, or aren't capable of taking certain food types or quantities, Olio volunteers are called up to collect." (Olio, 2023).	
Olio - Tesco *Relationship 3*	**Low** Not a lot of time is required to be spent on it because it now works so smoothly. This is highlighted as a positive, and that if too much time was spent on it, it would likely be due to issues within the relationship.	**High/Medium** Would seek advice from Tesco and trust them as business partners. This relationship has been in place for three years, since August 2020.	**High** Little requirement for sharing any confidential information, but states that they would if needed.	**High** Described as a business arrangement which works well for both parties.	**Strong**
	Evidence They have a small team of people	**Evidence** *"They [Tesco] are the best [supermarket]*	**Evidence** *"Yes [we would share confidential*	**Evidence** *"We are a service provider for them.*	

	working on the relationship, both operationally and strategically, and they also support the Food Waste Heroes, the individuals in each location who volunteer to collect and redistribute surplus from their local stores (Interview 13, Olio).	*partner we have had" (Interview 13, Olio).* *"They [Tesco] are super helpful, they are very positive people." (Interview 13, Olio).*	*information with them], but it isn't really needed" (Interview 13, Olio).*	*They pay us. We provide and perform a service. It's a working commercial relationship." (Interview 13, Olio).* *"The idea was that Olio volunteers would step in wherever charities couldn't to rescue unsold food." (Olio, 2013).*	

Olio describes their relationship with Tesco as strong, and speaks very positively about them. On the other hand, Tesco perhaps does not prioritise Olio in the same way, preferring to use charity partners and offer to colleagues before offering food to Olio. This has led to a discrepancy in the analysis, where Table 6 above shows a ***strong tie*** in one direction (Olio-Tesco) and a ***weak tie*** in the opposite direction (Tesco-Olio).

It is interesting to note their differentiation between charities and Olio as a social enterprise, and how this affects their hierarchy. Where Olio are referred to as a 'for-profit' organisation, they are prioritised lower down than charity partners such as Fareshare, and even below their own colleague shop, demonstrating that they would prefer to support charity organisations where possible. This is the key difference which has led to the classification of the Tesco-Olio relationship as weak, whereas in the other direction the perception is different and classified as strong.

5.1.2.3 Tesco, community organisations and Fareshare Greater Manchester

Table 5G: Summary of tie strength between Tesco, community organisations and Fareshare GM nodes.

Tie	Time	Emotional intensity	Mutual confiding	Reciprocity	Overall
Tesco - Community organisations *Relationship 5*	**Low/Medium** The relationships with organisations through FareShare requires minimal time as it is mostly done using technology. Those	**Medium/High** In-store community champions form and maintain these relationships, or they go through FareShare which has been a	**N/A** No requirement for sharing any confidential information	**High** Tesco donate the food to the organisations, and in return they can use statistics and case study stories in their	**Strong**

	which are formed with individual stores require a little more time on liaison and communicating.	long-standing relationship. They trust that any agreed actions such as collection commitments will be delivered on.		marketing materials and CSR reporting. They also indicated a purposeful ‘over-ordering’ to allow them to distribute to charities. This is a strong indicator of reciprocity, as it demonstrates Tesco’s commitment to supporting the community organisations which they can clearly see a benefit in doing, from a social perspective and also from a marketing perspective.	
	Evidence *“It is really about nurturing that relationship between*	**Evidence** *“Individual stores do have individual relationships with*	**Evidence** *“There is an approval process at a high level at Tesco Head*	**Evidence** *“What customers think of the business is really the main*	

	the charity and the individual store which is really down to store managers more than anything" (Interview 1, Tesco).	*certain charities - you can see it in the data where one store will always give to this charity, because there's a really good link." (Interview 1, Tesco).* *"While we offer it to the charities, and they say yes, their collection isn't always perfect, so they might not actually come and take it in the end, and it just gets wasted either way" (Interview 1, Tesco).*	*Office, where, they say yes, this is a registered charity, so you can donate it there" (Interview 1, Tesco).*	*driver of all of this. If a customer sees that Tesco's is really into FareShare and donates 2 million meals, they are way more likely to come back." (Interview 1, Tesco).* *"It's about how we support them and how everyone survives." (Interview 1, Tesco).*	
Community organisations - Tesco *Relationship 5*	**Low/Medium** The relationships with organisations through FareShare requires minimal time as it is mostly done using	**Medium/High** There is sometimes some discrepancy over the volume of food to be collected, but on the whole they	**N/A** No requirement for sharing any confidential information	**High** They receive food from Tesco to support their organisations, in return helping Tesco's food	**Strong**

	technology. Those which are formed with individual stores require a little more time on liaison and communicating, and operate slightly differently.	are trusted as partners. These organisations certainly value the relationships they have with supermarkets such as Tesco and generally rate these relationships strongly, relying more on the strength of the individual relationships over the technology to support the process. They would seek advice if required on food safety etc.		redistribution statistics and reducing their overall waste.	
	Evidence *“There's a branch of Fareshare called Fareshare Go, which links individual supermarkets like*	**Evidence** *“So they would do something like change the way the software works, and that led to me not*	**Evidence** *“I don't know that there is any confidential information that's of interest to either party*	**Evidence** *“They’re really helpful but then they send us a text at 9 pm asking for someone to come within the hour to*	

	Tesco Extras with local charities who pick up food at the end of the day" (Interview 15, The Lighthouse Project).	*getting the text that I needed until way after, or my response not automatically being communicated through the software to the local store so they don't know I've responded. So the food has gone to waste when I've gone down to pick it up." (Interview 15, The Lighthouse Project).* *"I'm not as confident in the software as I am in the relationship" (Interview 15, The Lighthouse Project).* *"What they're saying is a lot more than we're getting and we've not managed to work out with them*	*really." (Interview 15, The Lighthouse Project).*	*collect all this chicken - so we come up against those kind of barriers." (Interview 16, Cracking Good Food).*	

		why that is yet. So it's like an open issue." (Interview 15, The Lighthouse Project).			
Tesco - Fareshare GM *Relationship 2*	**Low** The operational aspect runs smoothly so less time is required.	**High** Relationship has been in place for 10 years and they trust them as partners. They would seek advice from them if required.	**N/A** Little requirement for sharing any confidential information as this is done at the top level.	**High** Tesco donates food to them and Fareshare will visit to share best practice and ideas.	**Strong**
	Evidence Tesco is Fareshare GM's largest supplier with three deliveries per week (Interview 5, Fareshare GM).	**Evidence** *"Zero food waste is a very successful area for Tesco, I think and all these relationships have been forming for like 6 years or longer." (Interview 1, Tesco).*	**Evidence** *"Generally, we just don't need to exchange [confidential] information with them" (Interview 5, Fareshare GM).*	**Evidence** *"They are partners and generally we have very good compliance across all our partners." (Interview 1, Tesco).*	
Fareshare GM - Tesco	**Low** The relationship is managed at a higher	**High** Relationship has been in place for 10	**N/A** Little requirement for sharing any	**High** Tesco donates food to them and	**Strong**

Relationship 2	level so whilst no time is spent on relationship building, their only time allocation is in picking things up 3 days per week.	years and they trust them as partners. They would seek advice from them if required.	confidential information as this is done at the top level.	Fareshare will visit to share best practice and ideas.	
	Evidence *"As FareShare Greater Manchester, no time is spent on it really, because any issues we have with them we raise to our national food team. They deal with it because they are the ones who've got the relationships." (Interview 5, Fareshare GM).*	**Evidence** *"Tesco is the biggest supplier of food distributed by FareShare" (Source A2, Tesco).*	**Evidence** *"Generally, we just don't need to exchange [confidential] information with them" (Interview 5, Fareshare GM).*	**Evidence** *"There's a huge benefit to us in terms of the food that's coming in, and us being able to redistribute that, especially when we don't pay for the food. The benefit to the food markets and suppliers is that quite often it's food that would be going to waste, so food that they would be throwing in the bin at a cost to themselves"*	

				(Interview 5, Fareshare GM).	

These three nodes are being discussed together, as the relationships between Tesco and the community organisations are often managed via Fareshare local hubs, such as Fareshare GM in the case of Greater Manchester. This network contains several strong ties between nodes, not just at the central level but also at the store level with the local organisations. This would appear to counter Granovetter's claims that a higher number of weak ties would be more effective than fewer strong ties, as this network has demonstrated a series of strong ties which are viewed as essential for effective management of the food waste and surplus.

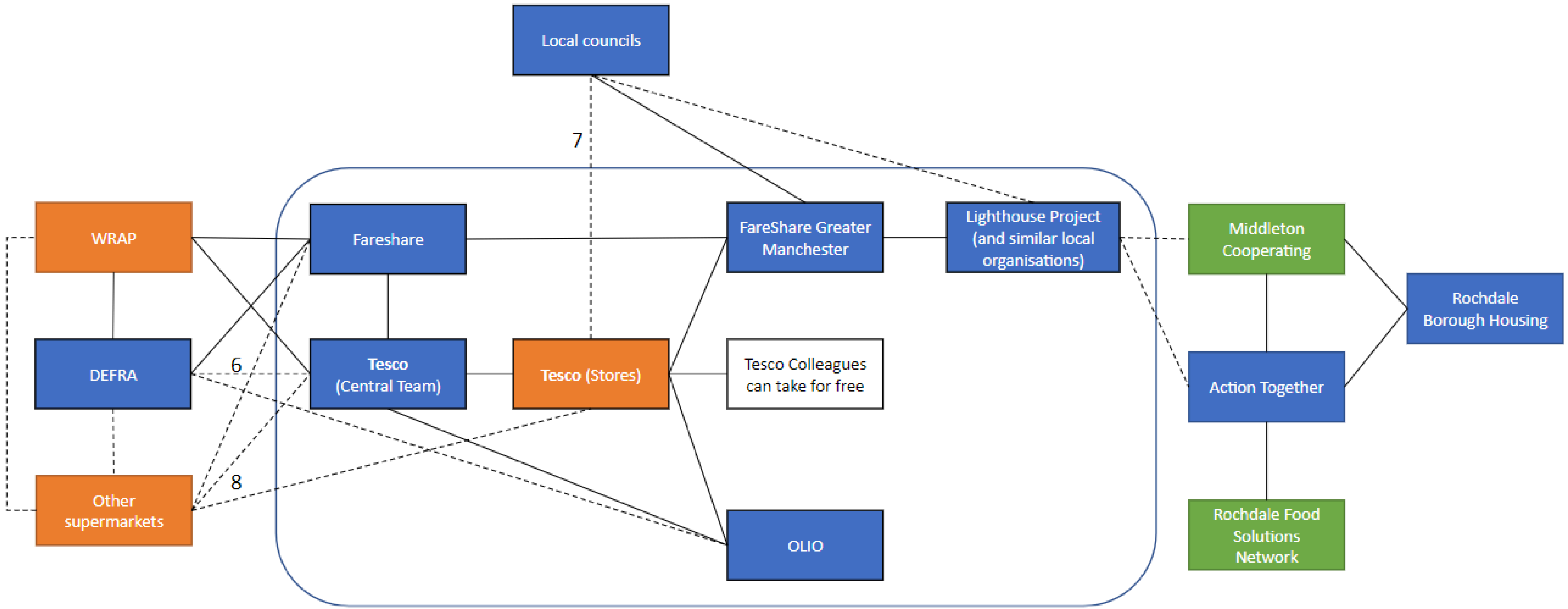
This evidence strongly supports the need for establishing strong ties within the network in order to best utilise the surplus food. This enables the network to work more effectively and results in less waste overall, as they are not receiving food which they cannot or would not use.

5.1.2.4 The wider network

This food waste network facilitates a high amount of food surplus redistribution - 2 million meals per month are redistributed to local communities across their UK stores (Tesco, 2022) - and it is built heavily around personal relationships between Tesco colleagues, in-store community champions and local organisations, in addition to the UK-wide relationships supported by Olio and Fareshare. These are highlighted in more detail in Table 1 above.

Looking beyond the core ‘supply chain’ network for food surplus at Tesco helps to demonstrate a more comprehensive network. In this network map, it shows the wider network around the core one, showing relationships where information is shared rather than just food. This network contains a combination of strong and weak ties, as demonstrated in Table 5H below.

Figure 5D: Wider network around Tesco, showing information-based relationships which support the food waste and surplus supply chain.



This table will summarise the relationships which are unique to the Tesco network, with other relationships discussed in section 5.4 in order to situate them across the three cases and discuss them in the context of the wider network of each case.

Table 5H: Summary of tie strength between the nodes in Figure 5D.

	Time	Emotional intensity	Mutual confiding	Reciprocity	Overall
DEFRA - Tesco *Relationship 6*	**Low** This relationship is managed through WRAP primarily, an NGO primarily funded by DEFRA.	**Low** This relationship is managed through WRAP primarily.	**N/A** No requirement for sharing any confidential information.	**Low** This relationship is managed through WRAP primarily.	**Weak**
	Evidence *“The nitty gritty of making those connections and relationships is probably more covered by WRAP.” (Interview 6, DEFRA).*	**Evidence** *“The nitty gritty of making those connections and relationships is probably more covered by WRAP.” (Interview 6, DEFRA).*	**Evidence** *“It’s just more around intelligence sharing and relationship building in the broader sense” (Interview 6, DEFRA).*	**Evidence** It is not common for DEFRA to hold these relationships directly unless there is a specific reason for them to be involved, for example a particular project or funding opportunity (Interview 6, DEFRA).	

Tesco - Local councils *Relationship 7*	**Low** Minimal time spent on the relationship.	**Low** More of a transactional relationship than one based on trust and advice sharing.	**N/A** No requirement for sharing any confidential information.	**Low** More of a transactional relationship than a reciprocal one.	**Weak**
	Evidence *"My job is to support the network, I don't have the time to do the work that's needed to look at food waste in Rochdale" (Interview 9, Action Together).*	**Evidence** *"Food banks will tell you they get a call at 10pm at night from Tesco to say we're closing our store and we've got all this food, can you come and pick it up, but they haven't got the volunteers to do that. So that's what I'm looking at." (Interview 7, GMCA).*	**Evidence** *"We've not really had any opportunity to discuss confidential information" (Interview 9, Action Together).*	**Evidence** *"People within the network, they'll go to Tesco, they'll go to Aldi, they'll go to Morrisons, they'll go to Lidl and all over the show, not just for the food waste, but to also buy additional products" (Interview 9, Action Together).*	
Tesco - Other supermarkets *Relationship 8*	**Low** Meetings of the ECR group (see RQ 4 and 5 below) are	**Low** Meetings are focused on the issues and are not established with	**Low** They are direct competitors so do not share confidential	**Low/Medium** With regards to the specific issue (e.g. food waste	**Weak**

	infrequent. Collaboration is rare due to GSCOP rules.	the intention of forming trust or advice based ties.	information.	reduction), it can be reciprocal in the sharing of ideas.	
	Evidence *“I went to one of their [ECR Group] conferences, I think a month ago now” (Interview 1, Tesco).*	**Evidence** *“When we work with other suppliers or supermarkets and suppliers to be fair, we're very careful not to infringe on GSCOP” (Interview 1, Tesco).*	**Evidence** *“They don’t really share specific details of what they are doing” (Interview 1, Tesco).*	**Evidence** *“Everyone there is a competitor really but it didn't feel like that at all. We were all just working towards one goal of reducing food waste and people were very free with like, yes, this has saved us loads” (Interview 1, Tesco).*	

5.1.2.5 DEFRA and Tesco

The relationships between DEFRA and organisations such as supermarkets, charities and social enterprises is largely managed through the NGO, WRAP (Waste Resources Action Programme), which means that there is no regular time commitment for this relationship, nor any emotional intensity in day-to-day operations, no requirement for sharing confidential information and whilst Tesco may need to follow guidance given by DEFRA, there is no reciprocity involved in this relationship, making it a ***weak tie***.

5.1.2.6 Tesco and local councils

The relationship between Tesco and local councils, in this case Rochdale council, is fairly limited, and a relationship around food waste and surplus is not well established. Whilst this may not be the case in other localities, it would seem that in Rochdale this is a transactional relationship, where some of the council initiatives may utilise Tesco to purchase items, but this is not focused on surplus or waste. As a result, with minimal time and reciprocity, and no assessment on emotional intensity and the lack of mutual confiding, this tie has been evaluated as a ***weak tie***.

5.1.2.7 Tesco and other supermarkets

Again, this is not a relationship which is in frequent communication or is in a position to share confidential information between parties, as they are direct competitors and GSCOP rules (see 5.1.4 and 5.1.5 for more detail) prevent too much collaboration. The relationships are largely focused around the ECR group, where best practice on issues such as food waste are shared. These relationships do not involve much time, nor any trust or emotional intensity, although in terms of reciprocity it can be argued that through the sharing meetings, each gains something from this. Overall, however, this is not a strong tie as it is not high on any of the four factors, and has therefore been assessed as ***weak***.

5.1.2.8 Summary

From Tables 5E, 5F, 5G and 5H, we can summarise that the information-based networks are made up of both strong and weak ties, but where a product (ie. food surplus) is moved through a network, this is done using a network made up of strong ties. This differentiation is important in understanding Granovetter's theory in the context of this network, as having weak ties within the wider network has proven fairly useful. Overall, however, it is clear that the strong ties in the main network are core to the success of food waste management. This will be discussed in more detail in the cross-case analysis, in section 6.0.

From these analyses, which were conducted qualitatively and using inductive reasoning for defining which ties are strong or weak, what has come out of it is that where at least two factors are marked as high, there is generally a strong tie outcome. These are mostly focused on reciprocity and emotional intensity as the ones which are key to defining the relationship as strong. This would indicate that in this sector, these would be the two most important factors in defining an effective food waste network. This is somewhat at odds with Granovetter's theory, which suggested that all four factors would be high where a strong tie exists. Again, this will be discussed in more detail in section 6.0.

5.1.3 Analysis of research questions 2 and 3

2. How do the strong and weak ties within the network effectively enable social enterprises to assist in managing supermarket food surplus, and how does this align with the **food waste hierarchy**?

3. Do **social enterprises** form a key component of UK supermarkets' food surplus networks?

From the analysis of the first research question, it is clear that social enterprises form a vital part of the supply chain for Tesco's food surplus. This is the case both for some of the charity partners who are also social enterprises and also for Olio. Resource Food, the animal feed partner for Tesco, can also be considered a social enterprise, as it meets the two key identifying criteria discussed in section 2.2 - that their social mission is at the heart of their work, and they achieve sustainability through trading of a product or service. This means that a significant proportion of Tesco's partners are social enterprises. They use the hierarchy order to redistribute food surplus amongst these social enterprises and other partners such as charities, food banks, colleagues and anaerobic digestion facilities. Some of these network ties were discussed in section 5.1.2, and an assessment of tie strength was made accordingly. As a result of these, it is clear that strong ties are most effective in managing and redistributing the food, but the weak ties support this network via information sharing in areas such as policy, technology and understanding of best practice.

Tesco operates a zero food waste policy, meaning that any food which cannot be shared through redistribution methods either becomes animal feed or is sent to an anaerobic digestion facility to be converted to energy (Source A1, Tesco). No food surplus is sent to landfill or composted, and they operate using a hierarchy of options for food redistribution.

> *"We basically have a hierarchy of how we donate our food. It first is offered to our charity partners, then to colleagues and to Olio, and then will be sent to be turned into animal feed and then, lastly, it'll be anaerobically digested" (Interview 1, Tesco).*

This is in alignment with the prioritisation within the food waste hierarchy. What's more, they have a target to increase donations for human consumption, intending to donate half of their food waste which is fit for human consumption by 2025 (Source A1, Tesco).

> *"Tesco is committed to donating half of everything that can be donated for human consumption to humans by 2025" (Interview 1, Tesco).*

This demonstrates a clear prioritisation of options further up the hierarchy, such as feeding hungry people, which aligns Tesco's strategy with the overall food waste hierarchy shown in Chapter 2.1. To do this, a network of primarily strong ties is used, as demonstrated in section 5.1.2. Whilst it is difficult to assess in the absence of any reciprocal weak ties in the Tesco network, there are other examples from the interviews with community organisations (Interview 15, Lighthouse Project) which state that where the ties were weak, the relationship simply did not work and was not continued. This is a clear indication that the ties need to be strong in order for the network to operate effectively.

Their general approach to food redistribution at the ‘feeding hungry people’ level of the hierarchy prioritises three stages - supporting charities, supporting their own employees, and finally supporting a larger social enterprise (Source A1, Tesco). They have a relationship with FareShare, with whom they share a strong tie, an organisation which works with charity partners to redistribute surplus food, who take the lead on this, but they also encourage individual stores to establish relationships with their own local charities and food banks, some of whom are also social enterprises. These partners take the food from Tesco free of charge.

> *“Each individual store has charity partners, so charities in the local area will get a chance to see what's being offered by Tesco at the end of the day, and if they want to take any of it, they can come and collect it [...] for free” (Interview 1, Tesco).*

Following the ‘colleague shop’ option, where staff can then claim anything for free which has not been distributed via FareShare or charity, the final stage is to redistribute using Olio (Source A1, Tesco; Olio, 2023), an international social enterprise and smartphone sharing application which utilises ‘Food Waste Heroes’ to go and collect the surplus food which has not been claimed following the colleague shop option, and redistribute it via the mobile application. This relationship is a combination of strong and weak ties as discussed in section 5.1.2.2.

> *“Anything left after that is then given to Olio or to our Olio champions who take the products, sometimes home or sometimes in-store, put it*

on the app, and then give it out to whoever comes and takes it from the Olio app." (Interview 1, Tesco).

This is an interesting differentiation as they have a clear preference for supporting charities over a for-profit company, even if it is a social enterprise. This presents a challenge for social enterprises operating in this way. Although many social enterprises in the UK are also registered charities (How Charities Work, 2019; GOV.UK, 2023), there is a perceived difference in the type of organisations, and therefore a conscious choice from Tesco of which they would prefer to support.

The social enterprises in this network include a number of organisations that are simultaneously charities and social enterprises. They meet the definition of a social enterprise (as discussed in Chapter 2.2) but are also registered as charities, with the exception of Olio, which is a limited company. Fareshare, The Bread and Butter Thing, Lighthouse Project and Cracking Good Food all make money from trading but are also registered as charities, and have been analysed as strong ties. This appears to also be important to Tesco when they decide where the surplus food goes.

"Generally we tend to aim for charity first, and then Olio [which] is a for-profit organisation. We obviously prefer it to go to charities" (Interview 1, Tesco).

Olio recognises themselves as a social enterprise rather than a for-profit organisation, although they can be both (see definitions in Chapter 2.2). It is an interesting finding that Tesco sees them in this way, and that it influences their inclination to offer them the food in a certain order. It would seem that the fact that an organisation is a social enterprise is not particularly relevant, as some are part of the earlier FareShare stage, but the differentiation is actually in the way of for-profit or not-for-profit.

It was also highlighted by Tesco that whilst source reduction is a priority, they consider the wider societal context of their organisation by maintaining a certain level of surplus which enables them to support their local community organisations and food banks, an indicator of a strong tie.

> *"We're hoping to reduce our waste as much as we can, for both financial and planet aspects, the less waste the better. When you do that though, you do sort of cripple charities' abilities to get the food to people." (Interview 1, Tesco).*

These competing targets make it more difficult to maintain the balance between low levels of waste and being able to provide for the local organisations they support.

> *"So Tesco's is in a really weird place where we're trying to do as much as we can one way, but also do them as much the other way. And no one's really come with a solution." (Interview 1, Tesco).*

This indicates a clear paradox for the hierarchy, where they could reduce their waste more, but actively choose not to. It would seem from this research, however, that the charities/social enterprises themselves are less aware of this as an active decision by the Tesco supply chain team, as during one of the interviews it was highlighted that where food is redistributed, it takes the food waste problem away from the retailer.

> *"Ultimately a small charity or small organisation, taking the food for free is actually taking the problem away from the retailer - food surplus is a cost that the retailer is trying to transfer" (Interview 17, Open Kitchen MCR).*

It can be argued, therefore, that clearer communications are required, to assist Tesco in getting this message across. If the organisations which are benefitting from the surplus food are unaware of this nuance in Tesco's decision-making, there is a potential imbalance in the perception of reciprocity, and who is actually benefiting from the relationship, which could in turn affect the strength of the tie and therefore the nature and success of the network.

Outside of the core supply chain discussed so far, Tesco also maintains relationships both up and down their supply chain, to support them in their food waste reduction. Tesco acknowledges that they have a high level of influence on their suppliers and also on their consumers, for example, removing buy-one-get-one-free offers on short-life perishable foods (Tesco, 2023), stocking 'wonky' fruit and vegetables, and helping suppliers with charity donations for their surplus. This also supports their own food waste reduction targets by staying in communication with them.

> *"We're the ones to talk to our suppliers, and we identify lines that aren't very basically waste lots that end up in the bin. So we work with them to try and get rid of any areas which you can't really sell anyway." (Interview 1, Tesco).*

These approaches combined help with source reduction and feeding hungry people within the hierarchy, but also aim to reduce the amount of waste going to landfill at other supply chain stages.

Overall, it would appear that Tesco does utilise social enterprises and also the food waste hierarchy for food surplus and waste redistribution, as evidenced within previous sections and also this section. They do this in a number of ways, and at multiple levels of the food waste hierarchy, using both local and national approaches to these partnerships to ensure that the variety of strong and weak ties are utilised effectively. It demonstrates the importance of strong ties at the core of the network, particularly with those charities and social enterprises which facilitate food redistribution.

5.1.4 Analysis of research question 4

4. Are there any key **facilitating factors** to support the effectiveness of managing food surplus, and do they differ between strong and weak ties?

From the thematic analysis which was conducted using NVivo using the interviews from across the actors in the network, the key facilitating factors in the network were identified from the interviews. These interviews took place with mostly strong-tied organisations, but with some support from those with weak ties. The facilitating factors discussed within the interviews include the following:

- Interest from senior members of supermarket staff.
- Understanding of the benefits from economic, social and environmental perspectives.
- Interest in working with stakeholders both upwards and downwards in the supply chain, beyond the focus just on their own organisation.

- Good communication and trust throughout the network.
- Utilising wider networks, including both strong and weak ties.
- Investment in and use of new and existing technologies.

Each of these will be discussed here in more detail, with supporting quotes from interviews and from secondary sources.

5.1.4.1 Interest from senior members of supermarket staff

Tesco demonstrates that there is interest from senior members of staff in the organisation, being the first UK supermarket to directly link the CEO’s bonus to food waste targets (Retail Gazette, 2022).

> *“Tesco's is quite fortunate because our directors are very into it. Tesco's, I think, was the first company in the world to link our directors’ bonuses directly to our food waste targets for 2025.” (Interview 1, Tesco).*

This investment is also reflected in the staff structure, as Tesco has established a ‘zero food waste team’, consisting of around 20 members of staff (Interview 1, Tesco). This demonstrates investment across the organisation in reducing food waste and meeting their 2025 targets. As this is an internal factor, tie strength is not indicative either way in this.

5.1.4.2 Benefits from economic, social and environmental perspectives

Tesco are proactive in the area of surplus food redistribution and is happy to acknowledge that it is helpful within their marketing materials in addition to the environmental and social benefits as discussed in Chapter 2.1.

> *“What customers think of the business is really the main driver of all of this. If a customer sees that Tesco’s is really into FareShare and donates 2 million meals, they are way more likely to come back.“ (Interview 1, Tesco).*

The wider benefits of reducing food waste are clearly acknowledged in an honest and relatable manner, demonstrating that these additional benefits are helpful in facilitating buy-in from across the organisation. This does not differ between strong and weak ties, as the benefits remain similar in these terms regardless of the tie strength. It can be said, however, that the stronger ties, which are more likely to be effective based on earlier analysis in this chapter, are more likely to facilitate these economic, social and environmental benefits. This is due to the fact they are more likely to be able to redistribute more food effectively between their strong network ties.

5.1.4.3 Working with stakeholders throughout the supply chain

Tesco works with stakeholders throughout the supply chain to support their suppliers, distributors and consumers in food waste reduction. FareShare also supports this and works within the Tesco supply chain. In addition, they work with their downstream waste handlers, such as their animal feed partner, Resource Food, to ensure they are operating effectively. This acknowledgement of their impact and responsibility, not just in their own operations but also in those they work with, demonstrates an understanding and interest beyond their own core targets and goals. This looks beyond the requirements to better understand their wider context.

> *"They run initiatives to sort of make sure our animal feed is going to the most effective way so working with our downstream sort of things. They work with supply chain to make sure that our waste numbers are [on track]" (Interview 1, Tesco).*
>
> *"Our biggest supplier who we have is Tesco. We work all down their supply chain as well." (Interview 4, FareShare).*

This acknowledgement facilitates an organisational environment which is not entirely focused on targets and performance indicators but on the issue itself. Whilst Tesco will be the first to admit that they would prefer to sell and profit from the food, helping the environment whilst also operating as a business, they also accept that the food being distributed would otherwise end up in landfill or in an alternative waste system such as anaerobic digestion, but that redistributing the food for free helps them reduce these levels of food waste overall.

Another initiative which was introduced in 2022 enables Tesco suppliers to interact and exchange products between themselves. Where there is surplus which is not required by Tesco, suppliers can use the Tesco Exchange platform to sell or donate surplus food to other suppliers as requested. This could be ingredients, by-products or packaging and could help others to reduce their costs. "One of the first listings was made by food manufacturer, G's Group, which supplies pickled beetroot to Tesco. The manufacturing process leaves them with tonnes of beetroot peelings that could be used by a livestock farm as cattle feed" (Tesco, 2022). This may not be an issue which affects Tesco's waste statistics but demonstrates a commitment to reduce food waste throughout their supply chain. Stock can be advertised by the supplier, and 'wanted' type posts can also be made to let others know what they require.

It is unclear whether the supplier relationships are strong or weak, as these were not assessed as part of this study. Tesco's commitment to supporting them, however, is indicative of their interest in food waste as an issue not just when it affects their own statistics, but also acknowledging their influence beyond this.

5.1.4.4 Good communication and trust throughout the network

As discussed earlier in Chapter 5.1, Tesco differentiates between food surplus and food waste in their statistics, where surplus is anything that can be redistributed to humans or animals, and waste is anything which cannot and goes to anaerobic digestion. This differentiation is important in understanding what constitutes food waste reduction for the organisation.

> *"The [zero waste] team there has fingers in everything that could potentially do with zero food waste they are sort of linked in. They look at all of that, and then they try and bring down food waste as much as possible." (Interview 1, Tesco).*

The inclusion of a zero food waste team demonstrates the holistic approach Tesco is taking to food waste reduction, and this is reflected in the attitudes of the supply chain team, and across the core relationships analysed in 5.1.2, where most were identified as strong ties. This is due to the levels of trust, advice sharing, communication and reciprocity which was discussed in more detail in the earlier section (5.1.2). There is also an understanding that forecasting and reductions form a key part of how much waste is generated and therefore are linked to many parts of the organisation.

> *"Obviously if you forecast very badly, you'll send too much stock in, and it'll get wasted. Or if you don't reduce it in time - reductions are mostly quite manual." (Interview 1, Tesco).*

Where reductions are currently fairly manual, new technologies appear to be emerging which may help to address this in the future. This will be further expanded below in section 5.1.4.6.

5.1.4.5 Utilising wider networks, including both strong and weak ties

In addition, Tesco aim to be ahead of government policy when it comes to food waste reduction, by setting targets beyond those expected by UK voluntary agreements (see Chapter 2.1). Tesco set their own targets, demonstrating a commitment to addressing the issue, and encouraging the government to follow their lead.

> *"I think it's irrelevant as long as the business is committed to actually what they say, and hitting the ESG targets. So bringing policy along with us rather than being dictated by it is the best way, I think." (Interview 1, Tesco).*

They do not see government policy as a facilitating factor nor a barrier, in fact rather irrelevant to the overall goal. Instead, they indicate that things such as data, information and technology innovations are what really facilitate the advancements in reducing food waste.

> *"That's where better data, better information, innovations with technology really are things that can help us tackle it. And then hopefully the Government will catch up later." (Interview 1, Tesco).*

Tesco's ties with local councils and DEFRA have been assessed as weak despite there being some benefits to both parties. Whilst in some ways, policy decisions encourage Tesco to remain ahead of their targets, it is in fact other factors such as information sharing, funding and best practice which are valued as part of the wider networks. This is true whether the relationship is strong or weak, demonstrating the value of the weak ties within the network.

5.1.4.6 Investment in and use of new and existing technologies

Technology innovation and enhancements were a key theme in many of the interviews, mostly labelled positively, as a facilitating factor rather than a negative, although there was some element of needing to be able to trust the technology which also came up in multiple interviews and occasionally affected how tie strength was perceived by the organisations.

Technology has evolved rapidly in recent years and is utilised in a multitude of ways in different sectors. The development of smartphones and smartphone applications (apps) has enabled a sharing economy approach to food waste redistribution, via apps such as Olio and Too Good To Go on the consumer side; FoodCloud, Foodiverse and Neighbourly on the more operational side. These apps have enabled the formation of a much wider network than would otherwise be possible. In order to share potential new technological solutions to food waste reduction, Tesco have taken part in the Economic Recovery Group (ECR) meetings. These meetings are not only focused on technology but generally on sharing best practice between government and retail (supermarket) organisations. A key part of this is food waste reduction, and examples generally focused on the introduction of new technologies that others were using to address this issue.

> *"There's the Economic Recovery Group. the ECR Group. It's an intra-government and intra-retail forum where you share best practices for reducing food waste." (Interview 1, Tesco).*

This group is very much seen as a positive approach to sharing best practice in a way which is unprecedented in the supermarket sector, as they are market competitors, and remain as weak ties. In this case, they are all working towards a single goal, which helps to focus the conversation and encourage sharing, for the sake of food waste reduction. They highlight the benefit of developing these relationships and remaining open and honest with each other on this issue in order to address it as a sector, again demonstrating the value of weak ties.

> *"In terms of relationships it's amazing. When we went to the conference in Rugby, obviously everyone there is a competitor really, but it didn't feel like that at all. We were all just working towards one goal of reducing food waste." (Interview 1, Tesco).*

In addition, this can lead to tangible effects on supermarket food waste, where those who are leading new initiatives can share what is working for them and perhaps what is not, and others can get enough information on them to decide what they might be able to take from that.

> *“So many different things can affect food waste and really that ECR Group is a great way for different companies to trial and say, we've been trialling this, we've noticed that it's significantly reduced food waste.” (Interview 1, Tesco).*

Through this group, it is not only supermarkets with something to share, but other suppliers such as technology suppliers attend and present information on their product and how it could benefit the supermarkets. For example, RFID (Radio Frequency Identification) tags on certain products which assist in identifying, locating and reducing products quickly to help with the tracking and automation of the food reductions in a timely manner.

> *“You can have a direct knowledge of where the products are in the store, you can see the code lives on them, so how long they've got left, so you can make sure you reduce them in time, and generally just better tracking of our products, which then helps food waste.” (Interview 1, Tesco).*

Using technology such as this can reduce the likelihood of human error, where items are not reduced on time and therefore do not sell and end up becoming food waste. Sharing ideas and technologies such as this can help to reduce waste, but comes with its own barriers such as cost and suitability for each individual store.

> *“But it's human error that goes wrong a lot and one thing we're trialling is trying to take out as much human error as possible. So the company we worked with for that, so Checkpoints, they were at the ECR Group.” (Interview 1, Tesco).*

From this, it is clear that technology could be a key facilitating factor in reducing food waste overall across the sector, and the utilisation of the weak ties which exist within the ECR network is key to the sharing of such resources. This has been demonstrated in the growth of platforms which enable the networks to work effectively, but care needs to be taken in their development to ensure that it does not affect the overall strength of the ties, where the technology overrides the personal and organisational relationships which support the network.

Overall, the key facilitating factors which help the network to operate effectively have been discussed here and expanded upon with quotes and material from the interviews conducted as part of this study for both strong and weak ties.

5.1.5 Analysis of research question 5

5. Are there any **barriers** to the effectiveness of managing food surplus, and do they differ between strong and weak ties?

Again, from the thematic analysis conducted using the NVivo software, barriers to the effectiveness of food surplus management within the Tesco supply chain were identified, focusing on six key points. These factors were mainly drawn from interviews with those in strong-tied organisations, supported by those from weak-tied organisations, which will help to understand how the barriers may differ. These are:

- Confidence in technology.
- Working within government rules for fair supplier relationships.

- Keeping up with international legislation.
- Competing targets and key performance indicators (KPIs).
- Cost-of-living crisis.
- Damaged stock.

5.1.5.1 Confidence in technology

Whilst technology can be a facilitating factor in many of these relationships, some may also see it as a barrier. One community organisation stated that their confidence levels overall were not necessarily in the technology which facilitates the relationship, but instead in the relationship itself.

> *"I'm not as confident in the software as I am in the relationship" (Interview 13, Lighthouse Project).*

This signifies the importance of an ongoing personal relationship alongside the technological, app-based one for this strong tie. The reasoning given for the lack of confidence was mainly around glitches in the software.

> *"They would do something like change the way the software works, and that led to me not getting the text that I needed until way after, or my response not automatically being communicated through the software to the local store." (Interview 15, Lighthouse Project).*

Whilst this is sometimes the nature of relying on technology, it can be seen here how it can affect the amount of food redistributed, but can have a detrimental impact on the smaller community organisations who would be relying on such a donation to feed their own members. Whilst these are strong ties, there is a risk that if technology is over-relied upon, it could be detrimental to the relationships overall, and in turn the strength of the tie. Currently, this is a barrier between mostly strong-tied organisations as they are the ones utilising the technology frequently.

5.1.5.2 Working within government rules for fair supplier relationships

Tesco highlighted the presence of an information-sharing network between supermarkets, and the ECR group, which helps to facilitate best-practice in the area of food waste and surplus management. This group meets fairly infrequently and was identified as a weak tie to other supermarkets. One of the barriers identified was around the government rules for how supermarkets operate and maintain their practices to avoid price gouging or any one supermarket gaining a monopoly on the market. These are known as GSCOP (Groceries Supply Code of Practice) rules (GOV.UK, 2009), and focus primarily on creating a fair market for supplier relationships. This means that when collaborating with other supermarkets and suppliers, they must be careful not to breach these rules in order to maintain fairness across the sector. This is also referred to in the Tesco Code of Business Conduct (Tesco, 2018). However, in terms of creating barriers to food waste reduction, this could be seen as a hindrance as collaboration is more difficult to achieve, even if they did want to, in light of these rules, ensuring that these ties remain weak.

> *"So when we work with other suppliers or supermarkets and suppliers, to be fair, we're very careful not to infringe on GSCOP." (Interview 1, Tesco).*

Clearly, these rules are important to ensure fairness and consistency within the sector and for suppliers, but it could be that in some ways it creates a barrier to collaborating on issues such as food waste reduction, keeping the ties between supermarkets weak.

5.1.5.3 Keeping up with international legislation

Further to this UK legislation, it is often the case that UK supermarkets operate not only in the UK but elsewhere in the world too. Tesco, for example, operates in Ireland, Hungary and Eastern Europe (Source A1, Tesco). This means that they not only need to abide by UK legislation but also by each individual country's legislation for each store in that location. This requires company-wide policies to be flexible based on what is required in each country and is the case for both strong and weak network ties.

> *"Tesco's has loads of stores in Hungary and Eastern Europe. So whatever Europe has, the legislation, we also have to follow that in those countries." (Interview 1, Tesco).*

This means that it can be more difficult to adopt a company-wide policy for food waste reduction, which was something discussed at the ECR group, where companies agreed that one uniform policy would be helpful, but is not currently possible.

> *"It depends on what we have to work towards. Having a uniform policy would be great, but there's no policy that fits all. So you have to custom-make it each time." (Interview 1, Tesco).*

This process of having to custom-make policies for each country is clearly time and resource-consuming, as teams in each country must keep up in order to ensure they are abiding by the relevant legislation across all of their strong and weak ties.

5.1.5.4 Competing targets and key performance indicators (KPIs)

Competing targets and KPIs even within one country is also something which was discussed in multiple different ways and is a clear barrier to fully effective and optimised food waste reduction. Tesco has a number of different priorities, which sometimes conflict with each other. For example, the supply chain team would prefer to optimise the supply chain in terms of monetary value, reducing the volume of wasted food based on the higher-priced products, such as meat. This is not dependent on the strength of ties, and is applicable across all ties, as it is mostly an internal issue despite its impact on the external organisations and how products are prioritised for them.

> *“In supply chain we care about the highest wasting pound, like meat products. They cost a lot more to make and sell. So when you waste it you lose a lot more money. We would rather get rid of lines like Indian ready meals which waste lots of money.” (Interview 1, Tesco).*

The zero waste team, however, has priorities based on product weight, so they are more focused on reducing food waste in heavier lines of produce, such as potatoes.

> “*The zero food waste team cares a lot more about the kilograms involved. So that's like your potatoes which sell for a kilogram for 80p because the way we measure our metrics is all in kilograms. So they could just get rid of all potato waste and they would instantly hit the 2050 target, no problem.” (Interview 1, Tesco).*

This demonstrates a conflict in the priorities of the two teams. It could be argued, however, that with both teams focusing on different product lines, the volume of food waste would ultimately end up lower, although on the other hand, it could be that working more collaboratively across teams would be more productive overall.

The other competing KPIs are around food waste reduction and the volume of food donated to charity. Tesco are constantly aiming to reduce waste and surplus, yet increase charity donations, but the two cannot co-exist unless framed as percentages, which does not appear to be the case.

> *"Most of that stuff [forecasting] is automated but it's how much we put our settings on to make sure we order enough that customers can get it, but also order not too much that we waste, but we waste enough that charity partners can get it. You've got like 3 competing KPIs there and there's no perfect way." (Interview 1, Tesco).*

A third KPI is brought in here which focuses on customers and ensuring enough availability for them. Not having empty shelves is a key part of supermarket stock management to ensure that customers are not lost based on product availability concerns, but again this can be at odds with food waste reduction KPIs.

For this study, the line between waste reduction and redistribution to charities can be seen as a barrier to fully effective food waste management, particularly as the focus should be at the top of the food waste hierarchy, namely source reduction. This appears to align with Tesco's priorities as a business, both for financial and environmental reasons, but this would likely be at a disadvantage to the social elements of redistribution, and provisions for charities such as food banks, which Tesco are keen to support via their primarily strong ties across the network.

> *"At some point we're hoping to reduce our waste as much as we can, for both financial and planet aspects, the less waste the better. So Tesco's is in a really weird place where we're trying to do as much as we can one way, but also do as much the other way." (Interview 1, Tesco).*

Solutions for this appear to have been discussed, from donating money rather than food, to amending timings for charity donations, but the risk with that is the potential financial impact where food could potentially have been purchased rather than donated.

> *"Things have been floated from paying how much we would have donated, so that sort of thing and giving it that way. One thing that I've been working on a lot recently is fiddling with the timings of donations." (Interview 1, Tesco).*

The conclusion of this was that as they are potentially donating less food anyway due to the better forecasting, it is not necessarily the case that it would cost them more money in the longer term, in fact, the opposite, as their forecasting leads to a better financial position. It is clear from these quotes that there is a genuine conflict in some of their targets and KPIs which they are working to resolve.

> *"It's a way to make up the fact that you are donating to them less anyway because of our better forecasting. That's one thing I find really interesting, balancing it up against ESG targets is really a hot topic." (Interview 1, Tesco).*

This has led to some ideas around more innovative approaches which are sometimes shared at the ECR group for all supermarkets to consider, via their weak ties. This takes the issue from a completely different angle, considering alternative approaches such as keeping food fresher or using new technologies to support their tracking.

> *"Sometimes it's taking a step back from that and it's like, okay rather than doing that, what if we just made food fresher or improved code lives. One of the big issues is the key competing KPIs, and it's really just trying to find a way around them, I think." (Interview 1, Tesco).*

Therefore, despite these KPIs still being in competition, it takes a different perspective on it and tries to approach it from a completely new angle which could benefit the business more widely, and therefore eventually support other KPIs too. This demonstrates the significance of this issue for both the strong and weak ties in the network.

5.1.5.5 Cost-of-living crisis

The cost-of-living crisis in the UK has had an impact on food in many ways. Food prices have increased significantly along with rates of inflation (House of Lords, 2023), and therefore as more people look to food banks for support, the demand from supermarkets to supply them has also increased. In the six months to September 2022, 320,000 people accessed food banks for the first time, which is a "40% increase in new food bank users when compared to 2021" (House of Lords, 2023). However, the reverse of this is that when items are initially reduced in store, more customers are looking for these reduced-cost products in the store too in order to keep their costs down, leaving less for charities to collect at the end of the day through the strong ties.

> *"Our reduced-to-clear stuff sells like hotcakes right now. Everyone grabs it as much as they can because they want a bargain. But that means there's a lot less available for charities. Some charities have sort of become dependent on the link to Tesco. " (Interview 1, Tesco).*

This is yet another conflict for supermarkets who are relied upon for support during this time, and yet find themselves with fewer items available to donate to the charities. This presents a clear barrier to an effective food waste management network, where the strong-tied organisations may lose out.

5.1.5.6 Damaged stock

Damaged stock is an issue in managing effective food waste networks, as it can often be the case that when stock is delivered, it is refused at the depot due to damage. In this case, whilst it is classed as waste, it never enters Tesco's statistics, instead becoming part of the supplier or distributor's waste statistics. This demonstrates the impact that Tesco can have throughout the supply chain on food waste management via both strong and weak ties, and perhaps how they keep some of their statistics down.

> *"So that would be kept as their waste. We sometimes donate directly [to Fareshare] from our depots, so not just from stores. I think, like a third of donations which go to charity come through just our depots directly rather than ever touching stores." (Interview 1, Tesco).*

Donating this stock straight to FareShare, a particularly strong network tie, in many circumstances appears to be a good solution for having it listed as surplus from Tesco's perspective, and not wasted from the supplier or distributor's perspective. Again, where stock is simply refused, this could be a barrier to enabling food waste to reach its desired destination, as Tesco has the infrastructure set up through their strong tie with FareShare to prevent the waste.

Overall, these barriers can present difficulties in fully optimising the food waste networks for both strong and weak ties, and each has been discussed in more detail here to explain how they are barriers to ensuring the network works as effectively as it could. These barriers will be revisited in section 6, where the three cases are compared and discussed in more detail.

5.1.6 Analysis of research question 6

6. What are the key **motivations** of food waste reduction stakeholders to partake in the network?

The motivations discussed in the interviews were all focused on wanting to do the right thing, support local communities and reduce the environmental impact of food waste in landfill. Some were more sceptical of the motivations of supermarkets, and this issue was actually acknowledged by Tesco in their interview, but there was also a clear commitment made to supporting charities and local organisations primarily via their strong ties.

Motivations could be either economic, social or environmental, as food waste has its benefits in each of these three areas (see Chapter 2.1).

A point made by Tesco which is of use in this study, is that whilst source reduction is utilised within their supply chain management, they are also conscious that organisations such as FareShare rely on Tesco stores for their surplus food, to be able to work with local organisations to redistribute it to. It was acknowledged that a small amount of surplus is therefore purposely maintained to ensure that they can continue to provide for those organisations and help to feed local communities who need the support of free or reduced-price food.

> *"At some point, we're hoping to reduce our waste as much as we can, for both financial and planet aspects, the less waste the better. When you do that though, you do sort of cripple charities' abilities, so food banks, to get the food to donate to people." (Interview 1, Tesco).*

They do, however, also acknowledge the financial aspect, both in the above quote and again directly in relation to why they are so focused on food waste redistribution and reduction.

> *"We won't become complacent at all. I think if only just for the fact that it's a massive financial benefit to solving food waste. So we'll definitely keep working towards it and helping as much as we can." (Interview 1, Tesco).*

Therefore, it is clear that Tesco understands both sides of the benefits of addressing food waste. They are primarily a profit-driven business and purport to have become a sector leader in this issue, with the assured data to support their claims, and the purposeful over-ordering suggests they are not only focusing on profit. Charities and social enterprises, however, may not see it that way, particularly if it becomes a barrier to their involvement in utilising that surplus food. The Bread and Butter Thing, a north-west based organisation which works similarly to Fareshare but on a smaller scale, has faced difficulty in attempting to engage with Tesco, which they partially put down to Tesco and partially to Fareshare.

> *“No matter what they say they're doing, they are definitely still just doing the low-hanging fruit, the retailers, and there is nothing that is driving them to do anything different, not public perception and not government at the moment, and that's shameful.” (Interview 12, The Bread and Butter Thing).*
>
> *“We publicly tell everybody that we engage with that we're not interested in taking food that they already supply to FareShare. That is not increasing the amount of food that is stopped from going to waste.” (Interview 12, The Bread and Butter Thing).*

Tesco would certainly refute this allegation, as they claim to be ambitious in reaching their targets, constantly seeking to meet them earlier than mandated, including the food waste target moving from 2030 to 2025 (Tesco, 2022; The Grocer, 2022).

> *“We're nothing but ambitious. The target is to half food waste by 2025. That target was brought forward from 2030. So we are already sort of realising that we could probably do this earlier, and we brought ourselves up to do it.” (Interview 1, Tesco).*

Other community organisations support and understand that they are working towards targets and acknowledge this in the notion of reciprocity, which works for both organisations involved in the network. This alignment of motivations is somewhat important in establishing strong ties, where the organisations support each other's motives for partaking.

> *"They've obviously got targets within the supermarket and within the company about maximising the amount of food waste they divert to charity. So that works well for them." (Interview 15, Lighthouse Project).*
>
> *"I also think it's beneficial for the supermarkets to have some usage, I feel like I'm going with my begging bowl but actually for them to give you that stuff rather than put it in the bin – maybe that helps their stats as well." (Interview 10, Rochdale Housing Association).*

This acknowledges the motivations of the supermarkets may well be mixed, but it works in the network context.

For the social enterprises, organisations such as Fareshare have a clear social mission at the heart of their aims and objectives and do not make a profit, so their motivations can be said to be primarily social and environmental.

> *"FareShare exists to turn an environmental problem into a social good so we take food waste, surplus food, good to eat surplus food from the food industry and redistribute it via our network of charities." (Interview 4, Fareshare).*
>
> *"We are a very practical charity so we are very mission-focused on getting food from industry and getting it to charities. We haven't done too much stuff that has strayed away from that core mission." (Interview 4, Fareshare).*

This is similar to other community organisations that state similar motivations, such as the Lighthouse Project and The Bread and Butter Thing.

“We wanted to invest in the local community in Middleton.” (Interview 15, Lighthouse Project).

“We're busy opening new hubs at the same time in new regions because this kind of 2-tier approach to food security is something that people are slowly starting to catch on to.” (Interview 12, The Bread and Butter Thing).

“The voluntary sector is a kind caring sector and they just want to help their communities.” (Interview 9, Action Together).

Overall, it seems there is an expected distinction between supermarkets and social enterprises and how they might prioritise their motivations, but certainly, in Tesco’s case, where they already go above and beyond the minimum requirements from their voluntary agreement, there are signs that despite their focus on economic benefits, they also have a focus on the social and environmental benefits, which is an enabler for strong ties in the network.

“Tesco is a member of Champions 12.3 and works in support of UN Sustainable Development Goal Target 12.3 to halve global food waste by 2030. In light of the business’ sustained efforts and ongoing changes to meet this goal, Tesco now aims to halve food waste in its operations by 2025, 5 years earlier than the global target.” (Tesco, 2023).

This helps the system to run effectively, allowing the network to redistribute a large amount of food surplus through their primarily strong ties.

5.2 Case study 2: Morrisons

5.2.1 Introduction

Morrisons is a UK national supermarket operating in England, Scotland, Wales and Gibraltar. Its operation in the UK consists of 497 stores, with additional international reach through a wholesale agreement with the international organisation British Corner Shop. It holds the 5th largest market share of UK supermarkets, currently, as of April 2023, around 9% (Kantar, 2023). Morrisons primarily sells food but also sells other items such as toiletries, electronics, home decor, toys and games. It operates stores of varying sizes, from the largest Morrisons stores, which stock a wider variety of food and non-food items, down to much smaller Morrisons Local stores which are generally focused on convenience foods and essential items.

Morrisons publishes an annual sustainability report via their website, containing information on their activity under four main headings - Purpose, Planet, People and Performance. Food waste comes under the Planet section, and the statistics are all published under this heading. The latest full report is from 2020/21 (Source B, Morrisons), and there is a small amount of updated information available on the website. These will be used together to summarise Morrisons' activity in this area.

Morrisons utilises a hierarchy-type model to redistribute their food waste, firstly highlighting the attention to forecasting to optimise their supply chain and reduce the level of waste at the source overall. This is followed by redistribution to people -

through Too Good To Go, Company Shop, Bread and Butter Thing and FareShare. In addition, individual stores can develop relationships with local organisations and support charities through their Unsold Food Programme (Morrisons, 2023). Anything which cannot be redistributed is anaerobically digested to create energy. This is in alignment with the WRAP hierarchy (see chapter 2.1). Other hierarchy levels, such as animal feed, are not included as Morrisons do not utilise these options, including landfill to a certain extent. As part of their assurance data, Morrisons (2023) confirm that they send their food waste to Valpak (waste contractor) who prioritise anaerobic digestion, then composting, and landfill only comes in as a last resort. They also work with their suppliers to help reduce waste at different points in the supply chain - introducing a ‘naturally wonky’ range of fruit and vegetables which sold 34,000 tonnes of 22 different types in 2021 (Morrisons, 2023). They have also introduced initiatives to help customers reduce waste, for example by changing ‘use-by’ dates to ‘best-before’ dates on their own-brand milk.

Table 5I below demonstrates the volumes of food waste at different levels of the hierarchy. Tonnage information is not publicly available for the redistributed food, instead measured in ‘units’. These include 1 million ‘meals’, which are distributed through Too Good To Go, Company Shop and Bread and Butter Thing, and 2 million ‘products’ donated through the Unsold Food Programme (Morrisons, 2023).

Table 5I: Food waste redistribution by levels of the food waste hierarchy (Source A, Morrisons, 2021).

Hierarchy level	**Food waste redistributed**
Source Reduction (2016-2022).	5,000 tonnes
Feeding Hungry People	3 million units (1 million “meals” and 2 million “products”)
Anaerobic digestion (with composting and landfill) (2021/22).	14,366 tonnes

**Source reduction is against a baseline in 2016 and up to 2022.*

Table 5I demonstrates a higher proportion of food waste going to anaerobic digestion than source reduction. Still, it is difficult to tell where that fits with the unit numbers for feeding hungry people. This makes it difficult to assess it against the hierarchy other than to say that the anaerobic digestion level is higher than source reduction, indicating an inversion of the hierarchy, where more waste is going to the levels further down the list. This could be a potential area of focus for the future for Morrisons.

In terms of relationships within the network, Morrisons works on a national level with Too Good To Go, Company Shop and The Bread and Butter Thing. These relationships are managed from the head office level and are simply operationalised within stores with very little input from them on relationship building (Morrisons, 2023). The stores have community champions who work with local organisations on the Unsold Food Programme, so their focus is on maintaining relationships with those organisations. Morrisons currently works with over 400 local community organisations through this programme (Morrisons, 2023).

In summary, Morrisons are working towards halving their food waste by 2030, excluding that which is redistributed. They are therefore currently focusing on source reduction and redistribution to work towards this UN SDG target, both at a national level and at an in-store level, with the different partnerships working together to reduce waste overall.

The interviews which are core to this case in the first instance are Morrisons (Interview 2), Fareshare (Interview 4), Fareshare Greater Manchester (Interview 5), Too Good To Go (Interview 14) and local organisations including Lighthouse Project and Cracking Good Food (Interviews 15, 16, 17). Later in the case when the wider network is discussed, supporting discussion will be included from DEFRA (Interview 6), and representatives from local government organisations and NGOs (Interviews 7, 8, 9, and 10). This is triangulated using secondary sources (Table 5K) including annual reports, sustainability/CSR reports, policy documents and other market analysis sources. This information is summarised in Table 5J below, with the core organisations which form the food surplus supply chain highlighted.

Table 5J: Interviews used in the analysis of the Morrisons case study.

Interview number	**Organisation**	**Role of interviewee**	**Type of organisation**
2	Morrisons, Whitefield store	Community Champion	Supermarket

4	Fareshare	Public Affairs, Policy and Campaigns Consultant	Social enterprise and charity
5	Fareshare Greater Manchester / Emerge	Membership and Information Coordinator	Social enterprise and charity
6	DEFRA	Senior Policy Advisor	Government
7	Greater Manchester Combined Authority	Public Service Strategy Reform	Local council
8	Greater Manchester Combined Authority	Head of Sustainable Consumption and Production, Environment Team	Local council
9	Action Together, Rochdale	Neighbourhood Facilitator	NGO
10	Rochdale Housing Association	Surplus Food Coordinator	Local council
12	The Bread and Butter Thing	CEO	Social enterprise
14	Too Good To Go	Regional Lead	Social enterprise
15	Lighthouse Project, Middleton	Volunteer, helped to set up the food pantry	Social enterprise and charity
16	Cracking Good Food, Manchester	Project Manager	Social enterprise and charity
17	Open Kitchen MCR	Former employee	Social enterprise

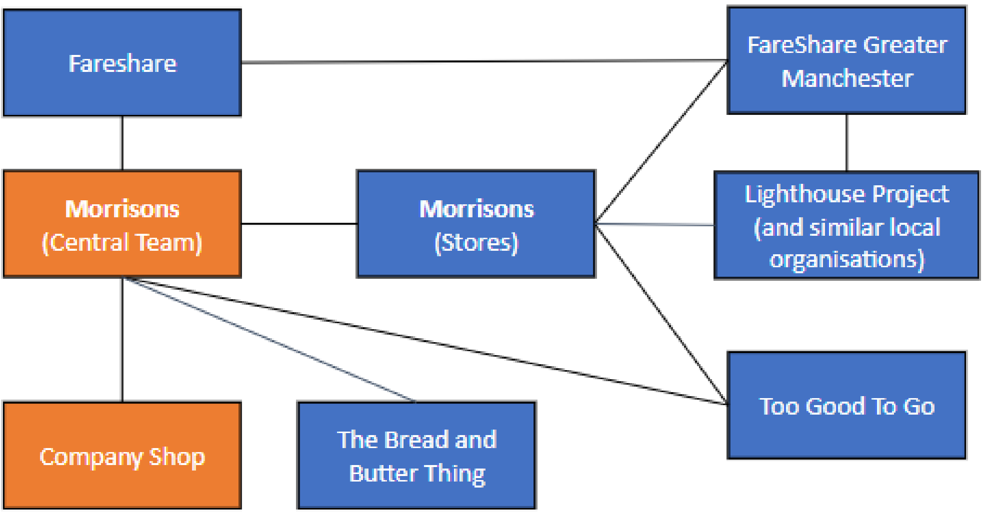
Table 5K: Secondary sources used in the analysis of the Morrisons case study.

B	Morrisons	Sustainability report 2021	Supermarket
E	Fareshare	Annual Report 2021/22	Social enterprise and charity
F	The Bread and Butter Thing	Impact Report 2022	Social enterprise

G	WRAP	The Food Waste Reduction Roadmap - Progress Report 2021	NGO
H	WRAP	WRAP Food waste measurement roadmap - 2020 guidelines	NGO
I	UN Environment Programme	Food Waste Index 2021	NGO
J	Champions 12.3	2022 Progress Report	NGO
K	Too Good To Go	Impact Report	Social enterprise

For the Morrisons case study, the network map will first be explored, and analysed in relation to Granovetter's strength of weak ties theory. Each relationship tie will be qualitatively assessed based on the interviews which have taken place. The network map in Figure 5E shows a 'supply chain' of food surplus which originates in Morrisons stores.

Figure 5E: Network analysis of a single supply chain with Morrisons as the key node.

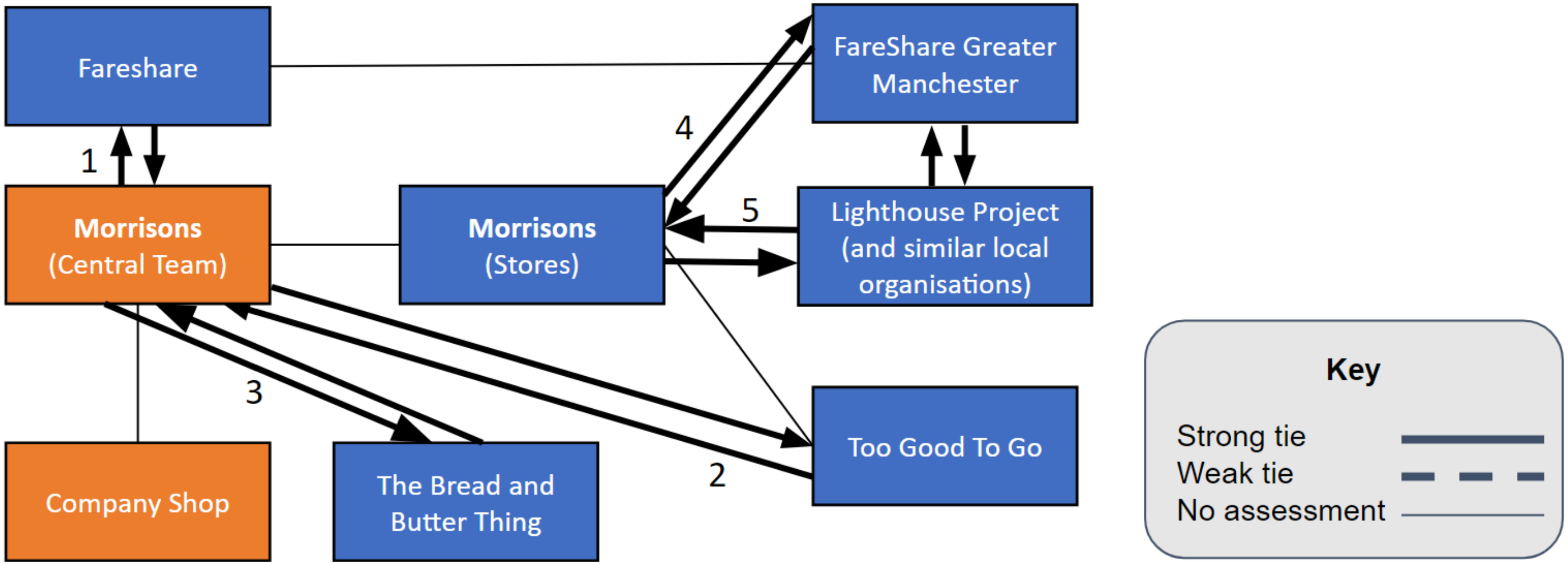


5.2.2 Analysis of research question 1

> 7. Are UK supermarkets' food surplus networks comprised of **both strong and weak ties** with social enterprises, governments and other supporting organisations?

In Figure 5F below, the network map has been modified to show the strength of the ties between each of the nodes in both directions. This helps to illustrate where there are strong and weak ties in the network and also any differences in perception between the two nodes. Where no assessment has been made, this is due to both nodes being within the same organisation, insufficient evidence to make an assessment, or the tie between the organisations has been assessed elsewhere.

Figure 5F: Network map showing directional strong and weak ties between the network nodes.



There is no particular order for Morrisons to redistribute via these channels, it is more the role of the community champion to try to allocate the food equally. They always have boxes for Too Good To Go as part of the national agreement, and after that, anything left is distributed amongst colleagues and community organisations. FareShare, Company Shop and Bread and Butter Thing primarily receive stock from the warehouses and distribution centres, not directly from the stores, as their relationships with Too Good To Go and with local organisations cover them. This includes anything which has a short shelf life or anything which is surplus to Morrisons' requirements. Each of these relationships is further discussed in this section. Each discussion looks at the relationships in both directions.

5.2.2.1 Morrisons and Fareshare

Table 5L: Summary of tie strength between the Morrisons and Fareshare nodes.

Tie	Time	Emotional intensity	Mutual confiding	Reciprocity	Overall
Morrisons - Fareshare *Relationship 1*	**Low/Medium** The operational aspect runs smoothly, so less time is required, but time is spent on data sharing, relationship building, learning etc.	**High** Relationship has been in place since 2017 and they trust them as partners.	**High** Data is shared in both directions to facilitate accurate reporting.	**High** Morrisons donates food to them and Fareshare gets the food to distribute to their contacts.	**Strong**
	Evidence *"We get one Morrisons delivery per week which has been set up by our local food team"*	**Evidence** *"We are really proud of our partnership with FareShare. Working with our manufacturing*	**Evidence** *"Working with third party data analysts, Valpak Limited, Morrisons has*	**Evidence** *"As a foodmaker that makes most of the fresh food we sell, our manufacturing sites*	

	(Interview 5, Fareshare GM).	*and logistics sites as well as Morrisons branded suppliers, surplus food is redistributed through FareShare's network of charities to those who need it most." (Morrisons, cited in Fareshare, 2019).*	*developed "a methodology" to record food wasted in its stores by weight. (Circular, 2018).* In order to facilitate this, data needs to be exchanged in both directions.	*represent the best opportunity to make a real difference by working with FareShare. We want more and more people to be able to eat well and that means ensuring as little as possible is wasted. Working with FareShare means we get surplus food made into wholesome meals where they are needed." (Morrisons, cited in Fareshare, 2018).*	
Fareshare - Morrisons *Relationship 1*	**Low/Medium** The operational aspect runs smoothly, so less time is required, but time is spent on data sharing, relationship building, learning etc.	**High** Relationship has been in place since 2017 and they trust them as partners.	**High** Data is shared in both directions to facilitate accurate reporting.	**High** Morrisons donates food to them and Fareshare gets the food to distribute to their contacts.	**Strong**

	Evidence *"We get one Morrisons delivery per week which has been set up by our local food team" (Interview 5, Fareshare GM).*	**Evidence** *"We are incredibly proud of our partnership with Morrisons." (Fareshare, 2018).* *"This important milestone is a testament to Morrisons commitment to tackling food waste and fighting food poverty." (Fareshare, 2019).*	**Evidence** *"Working with third party data analysts, Valpak Limited, Morrisons has developed "a methodology" to record food wasted in its stores by weight. (Circular, 2018).* In order to facilitate this, data needs to be exchanged in both directions.	**Evidence** *"The fact that we have already reached a milestone of providing over 100,000 meals is testament to Morrisons commitment to putting their surplus food to the best possible use." (Fareshare, 2018).*	

The relationship between Morrisons and Fareshare does not occur at the store level, only at its food production and manufacturing sites (Fareshare, 2018). In 2018, in less than nine months, 100,000 meals' worth of food was donated to Fareshare from Morrisons sites (Fareshare, 2018). As a result of the evidence in the table above, this has been identified as a **strong tie**.

5.2.2.2 Morrisons and Too Good To Go

Table 5M: Summary of tie strength between the Morrisons and Too Good To Go nodes.

Tie	Time	Emotional intensity	Mutual confiding	Reciprocity	Overall
Morrisons - Too Good To Go *Relationship 2*	**Medium/High** On the operational side, the stores spend approximately one hour per day preparing and uploading the food boxes to the app.	**High** Communication is managed in its entirety at the head office level, but it is acknowledged that the relationship works very well. High level of engagement at head office and from Too Good To Go.	**N/A** No confidential information is shared between the stores and Too Good To Go.	**High** The relationship is described as equally beneficial for both parties.	**Strong**
	Evidence *"I would say probably an hour a day, putting it all together. They have to put a certain amount in the box and then we just have to upload it on*	**Evidence** *"More recently, we do the Too Good To Go bags which are the magic bags, and they just fly out. We just put them out on on social*	**Evidence** *"No, it wouldn't be relevant" (Interview 2, Morrisons).*	**Evidence** *"I'd say it's probably quite equal really. It's good for us and it's good for them, isn't it?" (Interview 2, Morrisons).*	

	the Too Good To Go app.” (Interview 2, Morrisons). *“All Morrisons stores do that [Too Good To Go], yeah.” (Interview 2, Morrisons).*	*media, on whatever bag website or the app is, and people just jump on straight away, and they’re getting like a lot of produce that will be – the use by date will be that day and they will get it for I don’t know – £3 or £4 for a box of all sorts of whatever we’ve got that day that hasn’t sold and that goes to them.” (Interview 2, Morrisons).* *“It works really well.” (Interview 2, Morrisons).*		*“100,000 bags of unsold food have been sold, saving 250 tonnes of CO2e. 100 tonnes of food waste has been prevented.” (Morrisons, 2020).* *“We’re making good food affordable for everyone and working with the Too Good to Go app also reduces food waste. Customers love it because they save money and the environment at same time.” (Morrisons, 2020).* *“We can help cut food waste while also helping customers to save money.” (Morrisons, 2022).*	

Too Good To Go - Morrisons *Relationship 2*	**High** Several roles within Too Good To Go who focus solely on the relationship with Morrisons.	**High** Long-standing relationship which is highly engaged from both nodes.	**High** Information is shared in both directions to enable high-quality outputs from the relationship.	**High** Mutually beneficial, as Too Good To Go can share reports and statistics, and Morrisons provide a consistent supply of food surplus and brings more customers to their app.	**Strong**
	Evidence *“We have people within the business who specifically focus on that account and it’s their entire role here.” (Interview 14, Too Good To Go).* *“They may have weekly or bi-weekly check-ins with whoever the point of contact on the other side is” (Interview 14, Too Good To Go).*	**Evidence** *“Our longest-standing supermarket partner is Morrisons. They've been with us for several years now.” (Interview 14, Too Good To Go).* *“There is a very engaged ongoing relationship with them [Morrisons], always looking at new ways to optimise and really capture all of the ways that they can offer*	**Evidence** *“We'll create joint assets and stuff like that and have really clear project plans and ensure that things are delivered to a really high quality.” (Interview 14, Too Good To Go).*	**Evidence** *“Yeah, definitely mutual. We provide a lot of sustainability reporting that a lot of other businesses who are within the food saving field just aren't able to, so they get that benefit. We get the benefit that we have such a great partner with us that attracts more users to use us.” (Interview 14, Too Good To Go).*	

		[food] to us. So, for example, we recently launched in all of the Morrisons cafes, which is a separate remit within Morrisons." (Interview 14, Too Good To Go). *"Obviously, it's their food. They know more about it than we do. Or we can advise based on the data that we have that we can collect through our system." (Interview 14, Too Good To Go).* *"Morrisons commitment to fighting food waste has made them the perfect partner for us, and I'm excited to see how we can continue our impact. We're proud*		*"Working with Morrisons has proven just how impactful collaboration is to reduce food waste. Our users have loved rescuing the Morrisons Magic Bags and I know, together, we can continue to make big strides in the fight against food waste in the months and years to come." (Too Good To Go UK Country Manager, in Morrisons, 2020).* *"At Too Good To Go we believe that saving food from going to waste is a real win-win-win.* *"Businesses can recover the sunk cost of would-be wasted food, consumers can get*	

		to be partnered with Morrisons and I can't wait to see our partnership continue to flourish." (Too Good To Go UK&I Managing Director, in Morrisons, 2022).		*good food for less, and with one simple action, we're collectively doing something great for the planet by stopping that food from ending up in landfill." (Too Good To Go UK&I Managing Director, in Grocery Gazette, 2023).*	

Morrisons have been working with Too Good To Go since 2019 and have proven very popular on the app. In one year, they sold 100,000 boxes, saving an estimated 100 tonnes of food from being wasted (Morrisons, 2020). They were the first UK supermarket to use Too Good To Go as a food redistribution solution, charging between £3 and £4 for a box worth a minimum of £10. Too Good To Go was established in Denmark, and is now in 17 countries worldwide (Zero Waste Europe, 2020). The evidence shown in the table above demonstrates a **strong tie** between the two organisations.

5.2.2.3 Morrisons and The Bread and Butter Thing

Table 5N: Summary of tie strength between the Morrisons and Bread and Butter Thing nodes.

Tie	Time	Emotional intensity	Mutual confiding	Reciprocity	Overall
Morrisons - Bread and Butter Thing *Relationship 3*	**High/Medium** An extension to the partnership demonstrates that the relationship is working smoothly and they are willing to invest more time in the relationship to donate more.	**High** Provided transportation support to them to enable 80-100 pallets of food a month to continue to be provided to their service users.	**High** Would be happy to share confidential information with them when needed.	**High** Clear opinion that the relationship between Morrisons and TBBT is mutually beneficial.	**Strong**
	Evidence *"During 2021, Morrisons plans to redistribute surplus food to 30,000 families in need through TBBT. Morrisons' partnership with TBBT was set up in 2016 and*	**Evidence** *"Morrisons rose to the challenge and helped keep TBBT's members fed across the summer [of 2021 during the haulage crisis] and beyond." (TBBT, 2023).*	**Evidence** *"Yes we exchange confidential information with them" (Interview 12, TBBT).*	**Evidence** *"We've made very strong progress in reducing waste in our supermarkets over many years. But there is still more to do behind the scenes and*	

	has so far provided 2m meals to its members." (TBBT, 2021).	*"Morrisons has been with TBBT since we launched in 2016." (TBBT, 2023).* *"The sustainability team have known me [TBBT] for a very long time and they trust us, so yeah I would imagine it's much more about them talking to us for advice and presenting us with opportunities if we want them." (Interview 12, TBBT).*		*this extension of our partnership with TBBT will mean they can do even more for families around the UK while at the same time helping us further reduce wasted food." (Head of Corporate Responsibility, Morrisons, in The Grocer, 2021).* *"Morrisons' support will enable The Bread and Butter Thing to expand nationally to 100 locations by the start of 2022." (Retail Bulletin, 2021).*	
Bread and Butter Thing - Morrisons *Relationship*	**High** Around 20 hours per week is spent on the relationship with Morrisons within TBBT,	**High** Highlights Morrisons as the best relationship they have currently, able to exchange	**High** Would be happy to share confidential information with them when needed.	**High** A strong feeling of reciprocity, that both sides benefit from the relationship and that	**Strong**

3	split currently between two people. This includes the relationship with head office and the operational aspects.	advice with them and trust them completely.		Morrisons are genuine in their reasons for engaging with them.	
	Evidence *"I would say, if we were trying to hire somebody to manage the relationship with Morrisons we would need somebody probably 20 hours a week." (Interview 12, TBBT).* *"To date, the partnership has enabled The Bread and Butter Thing to double its reach from its Greater Manchester origins." (Retail Bulletin, 2021).*	**Evidence** *"Morrisons are the best relationship we've got at the moment. We work with them in many, many different plants and sites and they also help us with logistics." (Interview 12, TBBT).* *"TBBT could not be more grateful to the vital support from Morrisons and its transport team in keeping TBBT supplied with quality surplus throughout the year." (TBBT, 2023).* *"I've got to say, they*	**Evidence** *"Yes we exchange confidential information with them" (Interview 12, TBBT).*	**Evidence** *"Genuinely with Morrisons I think it's reciprocal. I think it's a good balance." (Interview 12, TBBT).* *"If you look at Morrisons culturally, historically they've just been really keen to just put their heads down, crack on and get stuff done." (Interview 12, TBBT).* *"The financial savings for people using our service are significant, people eat better quality and a bigger variety of*	

		[Morrisons] have been outstanding." (TBBT, 2023). *"Support from Morrisons, especially for bulk surplus, has been nothing short of mission-critical. By doing so, TBBT is benefitting from almost 700 tonnes of food in 2021 alone – that's an amazing 1.6 million meals." (TBBT, 2023).*		*food, and we save tonnes of surplus edible food from going to waste. It's a win/win solution for everyone. Morrisons have been a major supporter since our launch." (TBBT, 2021).*	

The Bread and Butter Thing clearly rely on their relationship with Morrisons and values the contributions that Morrisons makes to them, both in terms of the food but also in terms of the support with things like transport and logistics. This investment from Morrisons means they also see clear value in supporting the organisation, overall making this a **strong tie**.

5.2.2.4 Morrisons, Fareshare GM and community organisations

Table 5O: Summary of tie strength between the Morrisons, Fareshare GM and community organisation nodes.

Tie	Time	Emotional intensity	Mutual confiding	Reciprocity	Overall
Morrisons - Fareshare GM *Relationship 4*	**Low** The operational aspect runs smoothly so less time is required.	**High** Relationship has been in place since 2017 and they trust them as partners. They collect food only from the depots, not the stores directly.	**N/A** Little requirement for sharing any confidential information as this is done at the top level.	**High** Morrisons donates food to them and Fareshare gets the food to distribute to their contacts.	**Strong**
	Evidence *“We get one Morrisons delivery per week which has been set up by our local food team” (Interview 5, Fareshare GM).*	**Evidence** *“This milestone represents the continued hard work and efforts of FareShare's volunteers and our site colleagues.” (Morrisons, cited in Fareshare,*	**Evidence** *“Generally, we just don't need to exchange [confidential] information with them” (Interview 5, Fareshare GM).*	**Evidence** *“There's a huge benefit to us in terms of the food that's coming in, and us being able to redistribute that, especially when we don't pay for the food. The benefit to the food*	

		2019).		*markets and suppliers is that quite often it's food that would be going to waste, so food that they would be throwing in the bin at a cost to themselves" (Interview 5, Fareshare GM).*	
Fareshare GM - Morrisons *Relationship 4*	**Low** The relationship is managed at the higher level so whilst no time is spent on relationship building, their only time allocation is in managing the delivery once per week.	**High** Relationship has been in place since 2017 and they trust them as partners. They collect food only from the depots, not the stores directly.	**N/A** Little requirement for sharing any confidential information as this is done at the top level.	**High** Morrisons donates food to them and Fareshare gets the food to distribute to their contacts.	**Strong**
	Evidence *"We get one Morrisons delivery per week which has been set up by our local food team" (Interview 5,*	**Evidence** *"We are incredibly proud of our partnership with Morrisons." (Fareshare, 2018).*	**Evidence** *"Generally, we just don't need to exchange [confidential] information with them"*	**Evidence** *"There's a huge benefit to us in terms of the food that's coming in, and us being able to redistribute that,*	

	Fareshare GM).	*"This important milestone is a testament to Morrisons commitment to tackling food waste and fighting food poverty." (Fareshare, 2019).*	*(Interview 5, Fareshare GM).*	*especially when we don't pay for the food. The benefit to the food markets and suppliers is that quite often it's food that would be going to waste, so food that they would be throwing in the bin at a cost to themselves" (Interview 5, Fareshare GM).*	
Morrisons - Community organisations *Relationship 5*	**Low/Medium** The relationships which are formed with individual stores require a little more time on liaison and communicating.	**High** In-store community champions form and maintain these relationships, or they go through FareShare or The Bread and Butter Thing which has been a long-standing relationship.	**N/A** No requirement for sharing any confidential information	**High** Morrisons donate the food to the organisations, and in return they can use statistics and case study stories in their marketing materials and CSR reporting.	**Strong**
	Evidence *"Being in the role now*	**Evidence** *"Our stores are*	**Evidence** *"There isn't a need [to*	**Evidence** *"I'll go along to*	

	for as long as I have been, which is almost 10 years, I've built up a lot of connections so I have a lot of people that come to me. Originally I would go looking for people to help out in the community, and things like that." (Interview 2, Morrisons). "So I will donate the food bags that I sell here in store and I have got a lot of people that I donate to, so I kind of do it on a – week by week basis. One week I will give to these two, and the next week I'll go to a different two." (Interview 2, Morrisons).	empowered to give surplus food to local causes such as food banks. They distributed 2 million products this way in 2022." (Morrisons, 2023b). "I am fortunate in the fact that I don't need to go chasing. I get a lot of connections, a lot of people that contact me: can you help me with this, can you do this, and what have you, and I always try to support as much as I can." (Interview 2, Morrisons). "So we could sell it off, and we would sell it off cheaper, but often what we would do is we'd let them have it and they would be making meals,	share confidential information], but I would definitely say I could. I would, if I needed to. But there really isn't ever a need." (Interview 2, Morrisons).	community events as well." (Interview 2, Morrisons). "In the last few years, we have concentrated quite a lot on food banks and food pantries." (Interview 2, Morrisons). "It's reciprocal." (Interview 2, Morrisons). "We're working to halve our food waste by 2030 across our stores and redistribute more food to communities that need it, which given the cost of living crisis is more important than ever. We take all available steps to minimise food waste in our stores. Technology	

		and it would provide for people in the community." (Interview 2, Morrisons). *"I definitely trust them, yes. I've built up a nice friendship with the two ladies that run it, a really nice friendship." (Interview 2, Morrisons).* *"Yes, yes, we do seek advice from them" (Interview 2, Morrisons).*		*makes our forecasts more accurate, and we only order what we think we can sell." (Morrisons, 2023b).*	
Community organisations - Morrisons *Relationship 5*	**Low/Medium** The relationships which are formed with individual stores require a little more time on liaison and communicating.	**High** On the whole they are trusted as partners although the frequency and quantity of food cannot be guaranteed as the community champion tries to distribute fairly amongst contacts, and is not	**N/A** No requirement for sharing any confidential information	**High** They receive food from Morrisons to support their organisations, in return helping Morrisons' food redistribution statistics and reducing their overall waste.	**Strong**

		always on shift to ensure orders are fulfilled.			
	Evidence *"Once we hear what is available we just need to go and collect it" (Interview 15, Lighthouse Project).*	**Evidence** *"Morrisons have community champions and they link really well with the local organisations and groups" (Interview 12, Cracking Good Food).* *"Completely from my understanding, it depends on the store management team. The community champion might think it's a great idea and might want to do it but if they're not on duty at that point, you have to go looking for someone and it might be gone by the time you arrive" (Interview 16,*	**Evidence** *"No we wouldn't need to do that" (Interview 16, Cracking Good Food).*	**Evidence** *"Morrisons are great in terms of allowing that kind of distribution of food that isn't just solely pallets. You don't have to just do pallets, you can do fifty of something rather than a full pallet, and the others aren't willing to do that but Morrisons do." (Interview 8, GMCA).*	

		Cracking Good Food). *"You go and talk to the community champions at Morrisons, but you're very conscious that they are supporting 3,4 or 5 very local groups. So I don't want to take out their share. So sometimes they might help you, maybe financially by giving you a discount, or will give you a gift card or something like that, instead of surplus food." (Interview 12, Cracking Good Food).* *"What Morrisons started to do was to speak to our local community and based on the cohort, because we've got such a diverse*			

		community across Greater Manchester, they would have a list of what they wanted people to donate to make sure then, that whatever was provided wasn't wasted.” (Interview 8, GMCA).			

Since 2016, Morrisons have worked with over 400 organisations to donate more than 3 million products within the community, stating “we currently donate unsold food to over 400 organisations who use the food to support their local communities” (Morrisons, 2023). From the evidence above, it is clear that these relationships work well, and have been assessed as a **strong tie** on this basis.

5.2.2.5 The wider network

Looking beyond the core ‘supply chain’ network for food surplus at Morrisons helps to demonstrate a more comprehensive network. In this network map, it shows the wider network around the core one, showing relationships where information is shared rather than just food. This network contains a combination of strong and weak ties, as demonstrated in Figure 5G below.

Figure 5G: Wider network around Morrisons, showing information-based relationships which support the food waste and surplus supply chain.

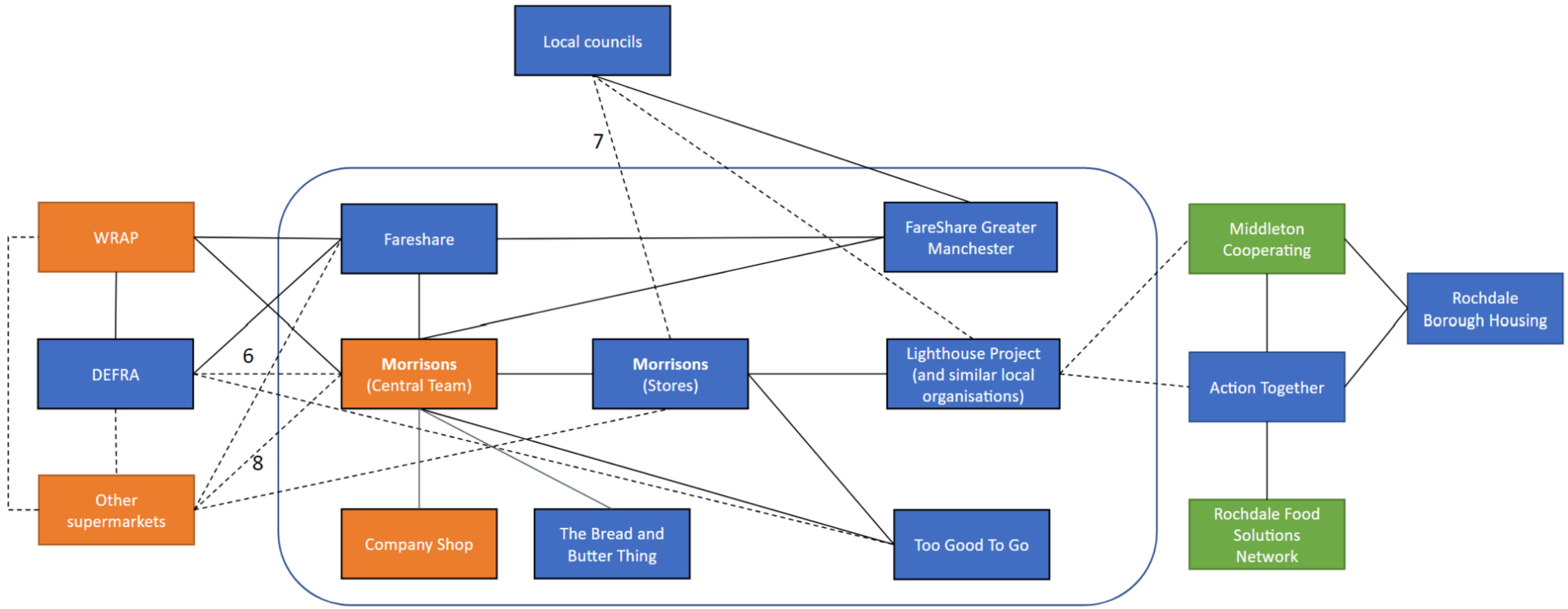


Table 5P: Summary of tie strength between the Morrisons, DEFRA, local councils and other supermarket nodes.

Tie	Time	Emotional intensity	Mutual confiding	Reciprocity	Overall
Morrisons - DEFRA *Relationship 6*	**Low** This relationship is managed through WRAP primarily, an NGO primarily funded by DEFRA.	**Low** This relationship is managed through WRAP primarily.	**N/A** No requirement for sharing any confidential information.	**Low** This relationship is managed through WRAP primarily.	**Weak**
	Evidence *"The nitty gritty of making those connections and relationships is probably more covered by WRAP." (Interview 6, DEFRA).*	**Evidence** *"The nitty gritty of making those connections and relationships is probably more covered by WRAP." (Interview 6, DEFRA).*	**Evidence** *"It's just more around intelligence sharing and relationship building in the broader sense" (Interview 6, DEFRA).*	**Evidence** It is not common for DEFRA to hold these relationships directly unless there is a specific reason for them to be involved, for example a particular project or funding opportunity (Interview 6, DEFRA).	
Morrisons - Local councils	**Low** One hour per month on the administrative side,	**Low** Communication is mostly via emails,	**N/A**	**High** Described as reciprocal as they help to publish	**Weak**

Relationship 7	plus a quarterly meeting around food strategy.	newsletters and meeting attendance, which Morrisons finds useful to assist in making other connections. This is not a relationship based on trust and advice, but more on information sharing.	No sharing of confidential information is required.	Morrisons' activities in addition to receiving information about other community events they could help with around food strategy.	
	Evidence *"Well, it's answering emails and there's one meeting that is more like quarterly. It's a big meeting, so that's probably about 2 hours every quarter for one, and then, on average I'd say an hour a month answering emails as they come in." (Interview 2, Morrisons).*	**Evidence** *"It's good because I get lists of what's happening in the community as well in relation to food banks, food pantries and if there's anyone that's opened up, and also what's going on in the community, who needs support, and if there's anything that I think that we can support from a store level then I'll jump*	**Evidence** *"We would, yes, but we don't need to". (Interview 2, Morrisons).*	**Evidence** *"Yeah, to be able to receive these emails with things on which obviously go out to a lot of people, and I can look at the newsletters. They help me as well because then they'll put things like Morrisons have done this, or Morrisons are doing that, or go along because Morrisons are raising money for this,*	

		in and be able to see what I can do." (Interview 2, Morrisons). *"I got invited to different meetings, hub meetings. I work with different councillors on food strategy meetings that I sometimes attend if I can. And it's all local, different people who help out in the community and so it's like anything, the more you get involved, the more connections you make. And it just goes from there, really." (Interview 2, Morrisons).*		*you know. So yeah, they are connections that are great to have." (Interview 2, Morrisons).* *"The Community Champion there offered us a 15% discount on our top-up shops if we shop in Morrisons." (Interview 10, Rochdale Housing Association).*	
Morrisons - other supermarkets	**Low** Very little time spent in communication, perhaps once per month as part of a	**Low/Medium** There is low emotional intensity here overall as it is acknowledged that the relationship is not	**Low** Confidential information is not shared between Morrisons and other supermarkets.	**Medium** Whilst the benefits of knowing each other are acknowledged as reciprocal, it is also	**Weak**

Relationship 8	relationship formed at community events.	utilised extensively. However, the way in which it is used is regarding broader advice around community-related issues or questions.		highlighted that it is the community which benefits from this connection rather than the supermarkets themselves.	
	Evidence *"I'm just in touch with her if I need to speak to her, or if she wants to do something, for instance, in the community." (Interview 2, Morrisons).*	**Evidence** *"If I needed something, and I thought she might know, I would ask her advice, yes." (Interview 2, Morrisons).* *"It probably wouldn't be good to be seen working together as such." (Interview 2, Morrisons).* *"It's not a competition, because at the end of the day, to me, as a community champion, you're there for the*	**Evidence** *"I would say she's probably trustworthy, but I would feel it's not the right thing for me to do, if that makes sense." (Interview 2, Morrisons).*	**Evidence** *"I'd say it's mutually beneficial. Absolutely." (Interview 2, Morrisons).* *"It's more for the benefit of the community than it is for the benefit of the companies or themselves." (Interview 2, Morrisons).*	

		community, and if by having a bit of the contact from a different supermarket to know something that maybe I didn't already know, or vice versa. If it helps the community, then I don't see that being any harm." (Interview 2, Morrisons).			

5.3.2.5 Morrisons and DEFRA

The relationships between DEFRA and organisations such as supermarkets, charities and social enterprises is largely managed through the NGO, WRAP (Waste Resources Action Programme), which means that there is no regular time commitment for this relationship, nor any emotional intensity in day-to-day operations, no requirement for sharing confidential information and whilst Morrisons may need to follow the guidance given by DEFRA, there is no reciprocity involved in this relationship, making it a **weak tie**.

5.3.2.6 Morrisons and local councils

The store-based relationships between the local council and Morrisons stores would appear to yield some benefits for Morrisons, but this is not particularly focused on the specific relationship, more the publicly available information that comes from it, and the further connections which can be made through it. Rochdale council, as part of Action Together, make some use of Morrisons, who give them a discount to purchase food at a wholesale rate as part of the food warehouse, but this is in more of a transactional manner.

5.3.2.7 Morrisons and other supermarkets

Again, this is not a relationship which is in frequent communication or is in a position to share confidential information between parties, as they are direct competitors and GSCOP rules (see 5.1.4 and 5.1.5 for more detail) prevent too much collaboration. These relationships do not involve much time, nor any trust or emotional intensity, although in terms of reciprocity it can be argued that through any sharing meetings, each gains something from this. Local stores may develop some informal relationships for the benefit of the community, but again this is not to benefit the organisations, more the community. Overall, however, this is not a strong tie as it is not high on any of the four factors, and has therefore been assessed as **weak**.

5.2.3 Analysis of research questions 2 and 3

8. How do the strong and weak ties within the network effectively enable social enterprises to assist in managing supermarket food surplus, and how does this align with the **food waste hierarchy**?

9. Do **social enterprises** form a key component of UK supermarkets' food surplus networks?

As detailed above in the evidence for the first research question, it is clear that Morrisons works with social enterprises throughout the food waste network and therefore it is demonstrated that social enterprises do indeed form a key component of Morrisons' food surplus network. They work with Too Good To Go at a national level, The Bread and Butter Thing primarily in the north of England, and various food pantries and individual social enterprises through individual store relationships.

This occurs in line with the food waste hierarchy, where they prioritise source reduction, followed by redistribution to hungry people before they progress through other avenues, such as anaerobic digestion. At the 'feeding hungry people' level, they first reduce items, then fill some boxes for Too Good To Go, some is then allocated through individual stores to local organisations such as charities and social enterprises, and it is finally offered to colleagues, leading to their zero food waste approach for edible food.

“We actually have what is called a zero food waste approach now in store.” (Interview 2, Morrisons).

This zero waste goal challenges stores to sell or redistribute all edible food in store, leading to improved statistics overall, with Morrisons claiming to have reduced food waste by 13% in 2020/21 compared to 2016/17 (Source B, Morrisons, 2021).

Starting with source reduction, Morrisons have taken an approach to reducing what is ordered for stores, to help reduce the amount of waste overall.

“To stop the waste, they’ve altered what we’re buying in so that you don’t have as much waste for that reason.” (Interview 2, Morrisons).

“Alongside minimising the levels of surplus we create, we are committed to finding innovative ways to redistribute surplus food to customers and communities.” (Morrisons, 2022).

This is in alignment with the priorities in the food waste hierarchy, which puts this approach at the top.

The ‘feeding hungry people’ stage of the hierarchy is where the three-stage process occurs as described above - firstly Too Good To Go and local organisations, and then colleagues.

“When we're left with surplus food in stores or at our manufacturing sites, we work with partners to redistribute as much of it as possible.” (Morrisons, 2023b).

“So if it’s due up on that day, we reduce things throughout the day. However, we do also keep some stuff back that will go, because obviously we have to have the Too Good To Go bags ready, and then

they get offered to the colleagues maybe at the end of the day, if they don't get sold." (Interview 2, Morrisons).

"If we've got an awful lot of one item, then half of that item will be distributed in the Too Good To Go bags" (Interview 2, Morrisons).

The distribution of surplus to colleagues comes after the social enterprises, and has proven to be successful following an initial trial period in the Midlands. This has now been applied nationwide due to the productivity and environmental benefits it has the potential to provide.

"As well as obviously doing the Too Good To Go bags, we also have it where colleagues will at the end of the day, if there's anything that is unsold that has been reduced, colleagues are encouraged and offered to have a few products themselves to take home." (Interview 2, Morrisons).

"They trialled it [offering food to colleagues] in the Midlands stores to see how it went and they saw that the productivity increase was over 300%. That's what the figures showed. And it has the potential to save more than 2,500 tons of CO2 per year." (Interview 2, Morrisons).

This process allows multiple opportunities for the food to be eaten by people before other options are utilised.

The variation across different areas was noted here, demonstrating that the stores do purposefully ensure that there are some products on offer for colleagues, and where they are not needed or wanted, they may add extra boxes on the Too Good To Go app, or more can go to local organisations.

> *"And again you will find more different stores, different areas, that they don't need it as much or they don't want it to, you know. Maybe they sell more of the Too Good To Go boxes because the colleagues maybe don't want it or don't need it because some areas are more affluent than others. But it is offered to everyone." (Interview 2, Morrisons).*

This is an important distinction to make, as it implies that more benefit could be given to the local communities, although Morrisons acknowledge that the increased cost of living in the UK (House of Lords, 2023) means that even those who are working could be struggling financially, and they want to help their staff where possible (Interview 2, Morrisons). This is not promoted publicly, however, and there is no information about this on the supermarket website.

The community champions in Morrisons stores assist with the Too Good To Go boxes, particularly when they are needed for redistribution of boxes which have not been collected by customers on the app.

> "*If they need support with the Too Good To Go boxes, if they've not been collected maybe, and they've got a box extra, I'll take that out to be distributed elsewhere." (Interview 2, Morrisons).*
>
> *"We work with registered B-Corp Too Good to Go to enable customers to buy high-quality products that are past their "best before" date at a fraction of their original price." (Morrisons, 2023b).*

This means that the food does not go to waste but can be redirected elsewhere through other channels such as local organisations or colleagues, which is helpful in reducing the waste statistics.

Morrisons head office can track, monitor and report on the progress being made by each store, as it is recorded on handheld terminals (HHTs) and classified according to its destination.

> *"Head office can see how many we've sold, and everything gets registered on a handheld HHT machine, so they can see what's been wasted, what's been reduced, and what has been sold to Too Good To Go." (Interview 2, Morrisons).*
>
> *"We continue to work with organisations such as FareShare, Company Shop and The Bread and Butter Thing to redistribute surplus food to where it is needed most in communities." (Morrisons, 2022).*

This allows tracking of products in order to facilitate source reduction where necessary and a better understanding of individual stores' waste statistics.

Overall, it is clear that Morrisons follows the food waste hierarchy, using social enterprises as a key part of that strategy, including both strong and weak ties. This is evidenced throughout these first two sections (5.2.2 and 5.2.3) and demonstrates Morrisons' clear commitment to food waste reduction via these routes. A combination of both national and local relationships helps the stores to facilitate the zero food waste approach, with the addition of assisting colleagues as part of that strategy.

5.2.4 Analysis of research question 4

10. Are there any key **facilitating factors** to support the effectiveness of managing food surplus, and do they differ between strong and weak ties?

From the thematic analysis, the key facilitating factors in the network were identified from the interviews. These interviews took place with mostly strong-tied organisations but with some support from those with weak ties. The facilitating factors discussed within the interviews include the following:

- Building relationships over time.
- Working across the region and not just independently.
- Using existing strong or weak ties within networks to introduce new opportunities.
- Utilising wider networks, including both strong and weak ties.

5.2.4.1 Building relationships over time

Morrisons identifies that having a person in the community champion role who has been there for a longer period of time helps with facilitating relationships within the network, meaning there is less chasing required and more awareness of the support that Morrisons can offer. This means that more organisations come directly to them, rather than the other way around where they are out seeking organisations to support.

“Being in the role now for as long as I have been, which is almost 10 years, I’ve built up a lot of connections so I have a lot of people that come to me.” (Interview 2, Morrisons).

“Our stores are empowered to give surplus food to local causes such as food banks.” (Morrisons, 2023b).

These long-standing relationships help to facilitate the reduction of food waste as it provides local organisations with a familiar route to request surplus food, and also help the community champion to maximise the resources available to support the community in the most fair and effective manner.

5.2.4.2 Working across the region and not just independently

Morrisons’ community champions hold some autonomy over the relationships they choose to make within the store, and how they operate. This is clear from how they work with community organisations and how they are able to build relationships with them over longer periods of time, but is also demonstrated at the core of Morrisons’ working practices.

“Colleagues are trusted to make their own decisions within the Morrisons plan, and are encouraged to improve things for customers and for themselves” (Morrisons, 2022).

Taken from their 2022 Annual Report, it demonstrates how this is embedded throughout the Morrisons organisation, and the in-store colleagues are able to support this through the development of their own relationships and networks to support their local communities.

Working collaboratively across the region and multiple Morrisons stores was identified as a key strength in the network, as the autonomy described by the quote above is not just relevant to relationships with external organisations but also internally between stores. The community champions across multiple stores work as part of a cluster to share ideas, contacts and progress, meeting weekly to support each other.

> *"I'm very much in touch with the Morrisons community champions in our region. There's 48 stores in our region, and I actually am what we call a cluster lead for 18 of those. I actually hold a meeting every week for that cluster and then every sort of 6 weeks we all get together, to share ideas and what we're doing, and how we're doing as a region." (Interview 2, Morrisons).*

This enables a network-based collaborative approach to food waste reduction not only with outside organisations but also within the organisation, where advice and ideas can be shared in order to facilitate the redistribution of food waste best. It can also enable opportunities to share surplus food to enable it to reach the most appropriate destination.

5.2.4.3 Using existing strong or weak ties within networks to introduce new opportunities

Morrisons highlight several opportunities where further network connections and further initiatives have been built upon existing ties. This method allows for relationships to develop over time, monitoring and analysing their outcomes before developing them into larger-scale networks.

For example, the relationship with Fareshare began in 2017 where a number of production centres worked with them to redistribute surplus food. This has since evolved to include the wider manufacturing network at Morrisons centres.

> *"Following the success of the partnership, Morrisons will work with FareShare to embed the FareShare redistribution model further into their wider manufacturing network." (Fareshare, 2018).*

This has not yet extended to stores, as they have taken an alternative approach (see section 5.2.1 and 5.2.3) to this, but demonstrates the potential for growth of the tie.

A further example is included in the development of new ties through the meetings which the local councillors host around food strategy. Morrisons observed that these meetings provided opportunities to meet other people working in this area, perhaps new contacts with community organisations which Morrisons could then support, and a better understanding of the local food network.

> *"It's all local, different people who help out in the community and so it's like anything, the more you get involved, the more connections you make, and it just goes from there, really." (Interview 2, Morrisons)."*

This idea supports Granovetter's theory, where weak ties lead to the development of further ties, demonstrating how such networks can work in action.

5.2.4.4 Utilising wider networks, including both strong and weak ties

In reviewing the evidence from Morrisons regarding their relationships with other supermarkets and their community champion equivalents, it was observed that a key facilitator for the effectiveness of the wider network was, in fact, the combination of strong and weak ties, and how they can come together for the benefit of the community, even in a less formalised manner than the established relationships with some of the other organisations which support the network.

> *"It's more for the benefit of the community than it is for the benefit of the companies or themselves." (Interview 2, Morrisons).*

Acknowledging this benefit for the community and the network itself rather than individual nodes, provides an insight into the motivations of the individuals in these roles and also their commitment to best serving their communities and, in turn, reducing food waste.

Morrisons also demonstrates an integrated approach to their supply chain and its environmental impact.

> *"In the financial period, we have undertaken a significant exercise to engage 400 of our own-brand suppliers in our new environmental improvement programme." (Morrisons, 2022).*

Utilising their supply chain network and also aiming to encompass their work in their environmental approach demonstrates their wider commitment to reducing food waste.

5.2.5 Analysis of research question 5

11. Are there any **barriers** to the effectiveness of managing food surplus, and do they differ between strong and weak ties?

Again, from the thematic analysis, barriers to the effectiveness of food surplus management within the Morrisons supply chain were identified, focusing on three key points. These factors were mainly drawn from interviews with those in strong-tied organisations, supported by those from weak-tied organisations, which will help to understand how the barriers may differ. These are:

- Restricted by sell-by and use-by dates.
- Short turnaround times for food.
- Damaged stock.

5.2.5.1 Restricted by sell-by and use-by dates

One barrier to successful food waste reduction, which was identified by Morrisons, was the legalities surrounding use-by dates on products. For certain products, there is a clear health and safety reason for working to these dates on fresh food items, but many consumers say that they are happy to eat food which is past the date printed on the food packet (Evans and Redmond, 2016). This means that there may be produce which ends up as waste, despite it being edible.

> *"The problem we had with that is sometimes things have a date on, and you can see they are absolutely fine, and would be for a few more days anyway." (Interview 2, Morrisons).*

These legal restrictions pose an issue for food redistribution as it often means that charities or local organisations cannot use the food donated and will decline the offer, leading to higher levels of waste. This is different for use-by and best-before dates, however, as those products with best before dates on can still be redistributed.

> *"We work with registered B-Corp Too Good to Go to enable customers to buy high-quality products that are past their "best before" date at a fraction of their original price." (Morrisons, 2023b).*
>
> *"In January 2022 we scrapped "use by" dates on 90 percent of our own-brand milk, changing our labelling to "best before". As a marker of quality, not food safety, it's designed to encourage customers to decide for themselves whether their milk is still good to drink." (Morrisons, 2023b).*

This switch from use-by to best-before therefore enables more of the product to be redistributed safely and within legal guidelines, reducing the overall level of waste.

5.2.5.2 Short turnaround times for food

Related to the issue of sell-by and use-by dates, having such short turnaround times for food redistribution can be a barrier to food surplus redistribution. It often means that intermediary organisations such as The Bread and Butter Thing may be unable to take it as they cannot redistribute it before the use-by date on the packaging, often leading to waste.

> *“Even if I’m offering it to a food pantry or food bank, if they can’t turn it around within a short time, then it’s no good to them either - back in the day, it would just get unfortunately wasted.” (Interview 2, Morrisons).*

Morrison's zero waste approach, with its multiple routes for redistribution, mean that whilst this food used to go to waste, it is now more likely to be eaten as it can now either go in a Too Good To Go box, or it can be taken by colleagues if other local organisations cannot use it due to this short turnaround time.

In addition, it can sometimes be the case that charity or social enterprise organisations can have their own ties to help to address this issue. For example, Too Good To Go and Fareshare work together so that food can be redistributed from Fareshare through the Too Good To Go app, when they would otherwise be unable to distribute it through their own service users due to short turnaround times.

> *“We have several charity partners, such as FareShare. The reason for this set up is because a lot of the food needs to be redistributed that exact day, or within those few hours in which the timeframe for charities is too small, and they can't safely redistribute that food.” (Interview 14, Too Good To Go).*

This arrangement is able to further support higher levels of food redistribution, saving more from going to waste.

5.2.5.3 Damaged stock

Morrisons try to reduce and sell damaged stock, or redistribute it, depending upon the level of damage and the suitability for it to still be consumed safely. Each store has a section for damaged and reduced stock where consumers can purchase it at a lower cost. If it is too damaged, such as open packaging or inedible produce, then it is recorded as waste and is sent through other options such as anaerobic digestion.

> *"It depends on when you say damaged, how damaged, if it's a can or something like that, there is an area for reduced things like that which is there all the time. So they will get reduced, and they will get sold." (Interview 2, Morrisons).*

The reduction in price gives the food another opportunity to be sold before it is recorded as waste, helping their statistics and allowing more food to be redistributed, not only in the circumstance of best-before and use-by dates.

Overall, these barriers have been addressed by Morrisons through the utilisation of the multiple options for redistribution, and through the inclusion of reduced sections in store for ambient items which are damaged or on clearance for any other reason, which helps to reduce food waste overall.

5.2.6 Analysis of research question 6

12. What are the key **motivations** of food waste reduction stakeholders to partake in the network?

The motivations of the stakeholders in the Morrisons supply chain were discussed in the interviews, with most focused on the benefits economically, socially and environmentally.

From an economic perspective, the recording of waste via the HHTs, the tracking from head office and the subsequent attention to source reduction demonstrate their attention to the financial benefits of food waste reduction.

> *“Head office can see obviously how many you know we’ve sold, and obviously everything gets registered on a handheld HHT machine, so they can see what’s been wasted, what’s been reduced. and what has been sold to Too Good To Go.” (Interview 2, Morrisons).*
>
> *“We take all available steps to minimise food waste in our stores. Technology makes our forecasts more accurate, and we only order what we think we can sell.” (Morrisons, 2023b).*

This has a knock-on effect for both social and environmental aims, some positive (e.g. reduced CO2 emissions) and some negative (e.g. less availability for local community organisations), but works in line with the food waste hierarchy which prioritises source reduction over any other food redistribution options.

From a social perspective, it is clear that the role of the community champion is to focus on this motivation, with the role primarily existing to aid the community relations between Morrisons and local organisations which support the community either as charities or as social enterprises.

“In each of our stores, we have a Community Champion. These amazing colleagues support our local communities - something that's really important to us at Morrisons.” (Morrisons, 2023c).

“My role is really to get involved in the community with all sorts of different things, with charities, with food banks, food pantries, support wherever it’s needed really, in care homes even, just do acts of kindness in the community.” (Interview 2, Morrisons).

The list is endless to be honest of what we do. We give donations out to local schools, and when they have Christmas fayres, especially obviously this time of the year, and throughout the year anybody that was holding maybe a coffee morning for MacMillan we will donate the cakes.” (Interview 2, Morrisons).

This wide range of activities demonstrates Morrisons’ commitment to addressing social issues in the community including food poverty, and their motivations towards assisting at local events and organisations through time and food donations.

Offering colleagues the option to take some of the surplus food also demonstrates their commitment to helping people socially, who may need it, despite this not being a scheme which is promoted publicly.

“So we’re trying to support colleagues because everybody is finding it hard at the minute. We keep some food back so that colleagues are able to get those as well because people think that just because you’re in a job you might actually not need the help but there are a lot of people that still do need that extra help.” (Interview 2, Morrisons).

This quote demonstrates that Morrisons understand the difficult situation that people may be in due to the cost-of-living rise in the UK (House of Lords, 2023), and want to also try to address this through helping provide them with any surplus food which is available.

Environmentally, Morrisons are aware of the potential impact which could be had on the environment as a result of their food waste reduction activity, as included in their 2022 annual report. It was highlighted that the figures predicted by Morrisons led to CO2 savings, just as a result of introducing the option for colleagues to take surplus produce from the store which would otherwise be wasted.

> *"The food system is a significant contributor to climate change and we recognise the urgent need to develop innovative approaches to reduce greenhouse gas ('GHG') emissions and transform food production and consumption. As a leading retailer, we know we must play our part." (Morrisons, 2022).*
>
> *"It [offering surplus to colleagues] has the potential to save more than 2,500 tons of CO2 per year." (Interview 2, Morrisons).*

This goal indicates a clear motivation in terms of the environmental benefits of food waste reduction, and an awareness of the significance of the environmental impact it can have if not addressed.

The Bread and Butter Thing certainly thinks highly of Morrisons, differentiating them from other supermarkets and identifying them as a company who engages in these activities more philanthropically than other supermarkets might.

> *"If you look at Morrisons culturally, historically they've just been really keen to just put their heads down crack on and get stuff done, whereas the majority of things that have been done by the other retailers has definitely been delivering for more column inches and it's been more important that the column inches are delivered." (Interview 12, The Bread and Butter Thing).*

This indicates that whilst their motivations are clearly multi-faceted, as demonstrated in this section, their overall intentions are good and are well communicated to their stakeholders.

Overall, the motivations indicated by Morrisons and as understood by their stakeholders are clearly well-intentioned, and their commitment to full-time community champion roles within stores provides additional support to this claim.

5.3 Case study 3: Co-op

Co-op is a UK supermarket, with over 2,500 local, convenience and medium-sized stores nationwide (Co-op, 2023). It holds the 7th largest market share of UK supermarkets, currently, as of April 2023, around 6% (Kantar, 2023).

Some Co-op food stores are franchises and are part of a different group of stores, for example, the Heart of England Cooperative or the Midcounties Cooperative. The stores in the north west of England, where this study is based, are not franchises and are owned directly by the Co-operative Group.

Co-op food is a member-owned organisation, where customers can become shareholding members and participate in democratic processes associated with the organisation, such as voting in elections, attending and voting at the annual general meeting and standing for election to the council or board. This makes the supermarket a type of social enterprise in itself, adding a different perspective to the study (see Chapter 2.2.3).

Co-op has a food waste goal which aligns with the UN Sustainable Development Goal 12.3, as part of their annual 'Co-operate Report' which states the following.

> *"We will reduce food waste generated by our stores and depots by 50% by 2030, compared to 2022." (Source C, Co-op, 2022).*

Co-op only started to track their depot food waste (as opposed to store waste) towards the end of 2021, but this means that they now have a more comprehensive picture of their waste and its redistribution, hence resetting their baseline to their 2022 figures.

Co-op and Microsoft have partnered to create their own food-sharing app platform, Caboodle (Source C, Co-op, 2022). Through this platform, they have been able to more closely monitor their surplus food redistribution from stores, which has grown by 14% between 2021 and 2022.

> *"The amount of surplus food redistributed to local community groups by our stores - managed through the platform Caboodle - has grown by 14% compared to 2021, donating 6,398 tonnes of edible food (2021: 5,774 tonnes)." (Source C, Co-op, 2022).*

This growth demonstrates their recent commitment to food waste reduction, and the focus on redistribution higher up the hierarchy.

This is also the case in their depot redistribution statistics, where a new focus on measuring surplus distribution from depots has enabled Co-op to set a baseline from which to measure their progress in the coming years, particularly to 2030 for the measurement against the UN Sustainable Development Goals (see 2.1.3).

> *"Depot teams shared 911 tonnes of surplus food with FareShare, The Bread and Butter Thing and Company Shop in 2022." (Source C, Co-op, 2022).*

This clear strategy which focuses on three partners for their redistribution from depots and different partners for their store distribution allows them to clearly differentiate between the two.

In relation to source reduction in stores, the overall percentage of food handled which becomes waste was reduced overall from 1.4% in 2021 to 1.3% in 2022. Table 5Q below summarises the figures in relation to other stages of the food waste hierarchy.

Table 5Q: Food waste and surplus redistribution by levels of the food waste hierarchy (Source C, Co-op, 2022).

Hierarchy level	**Food waste redistributed (in tonnes)**	**Food waste redistributed (as a % of overall waste)**
Feeding Hungry People	7,309	34.2%
Anaerobic Digestion/Green Energy	14,079	65.8%

This strategy somewhat reflects the food waste hierarchy, but disproportionately, where there is more food at the anaerobic digestion and green energy level compared with the feeding hungry people level. This inversion of the hierarchy demonstrates a justification for the Co-op's focus on increasing the donation of surplus food and the accurate recording of this at both store and depot levels.

Co-op also states directly that they aim to sell as much food as they can before sending it to community organisations such as food banks, which also includes their relationship with Too Good To Go, where food is sold at a reduced price but still has some financial gain for the company.

> *"It's just sell first and food banks second" (Interview 3, Co-op).*

This approach is also reflective of the food waste hierarchy, taking into account the economic priorities of the company alongside the social and environmental factors.

The interviews which are core to this case are Co-op (Interview 3), Fareshare (Interview 4), Fareshare Greater Manchester (Interview 5), Bread and Butter Thing (Interview 12), Too Good To Go (Interview 14) and local organisations including Lighthouse Project and Cracking Good Food (Interviews 15, 16, 17). Later in the case when the wider network is discussed, supporting discussion will be included from DEFRA (Interview 6), and representatives from local government organisations and NGOs (Interviews 7, 8, 9, 10 and 11). This is triangulated using secondary sources (Table 5S) including annual reports, sustainability/CSR reports, policy documents and other market analysis sources. This information is summarised in Table 5R below, with the core organisations which form the food surplus supply chain highlighted.

Table 5R: Interviews used in the analysis of the Co-op case study.

Interview number	**Organisation**	**Role of interviewee**	**Type of organisation**
3	Co-op	Community Funder	Supermarket
4	Fareshare	Public Affairs, Policy and Campaigns Consultant	Social enterprise and charity
5	Fareshare Greater Manchester / Emerge	Membership and Information Coordinator	Social enterprise and charity
6	DEFRA	Senior Policy Advisor	Government

7	Greater Manchester Combined Authority	Public Service Strategy Reform	Local council
8	Greater Manchester Combined Authority	Head of Sustainable Consumption and Production, Environment Team	Local council
9	Action Together, Rochdale	Neighbourhood Facilitator	NGO
10	Rochdale Housing Association	Surplus Food Coordinator	Local council
11	Stockport Homes	Food Project and Your Local Pantry Coordinator	Local council
12	The Bread and Butter Thing	CEO	Social enterprise
14	Too Good To Go	Regional Lead	Social enterprise
15	Lighthouse Project, Middleton	Volunteer, helped to set up the food pantry	Social enterprise and charity
16	Cracking Good Food, Manchester	Project Manager	Social enterprise and charity
17	Open Kitchen MCR	Former employee	Social enterprise

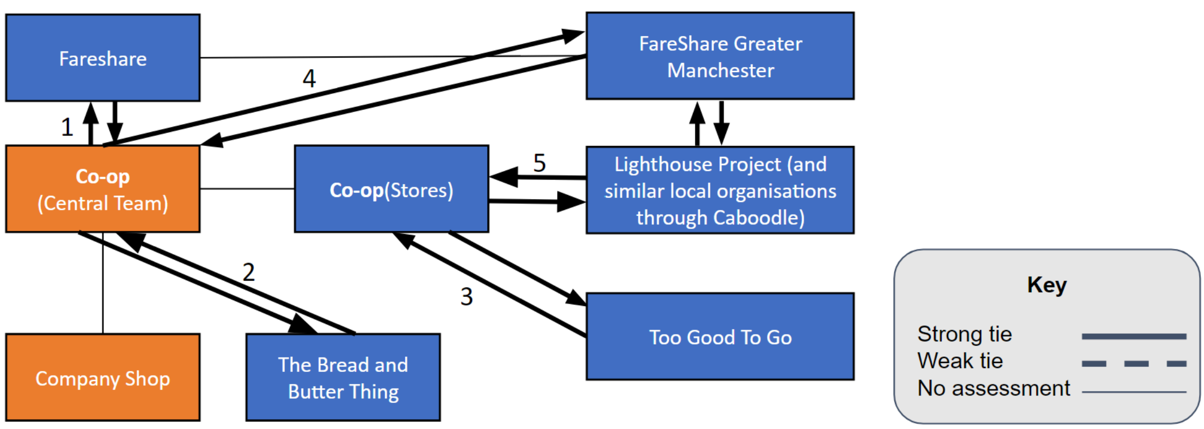
Table 5S: Secondary sources used in the analysis of the Co-op case study.

C	Coop	Co-operate report 2022	Supermarket
D	Midcounties Coop	Climate Action Report 2021	Supermarket
E	Fareshare	Annual Report 2021/22	Social enterprise and charity
F	The Bread and Butter Thing	Impact Report 2022	Social enterprise
G1	WRAP	The Food Waste	NGO

		Reduction Roadmap - Progress Report 2021	
G2	WRAP	The Food Waste Reduction Roadmap - Progress Report 2022	NGO
H	WRAP	WRAP Food waste measurement roadmap - 2020 guidelines	NGO
I	UN Environment Programme	Food Waste Index 2021	NGO
J	Champions 12.3	2022 Progress Report	NGO
K	Too Good To Go	Impact Report	Social enterprise

For the Co-op case study, the network map will first be explored, and analysed in relation to Granovetter's strength of weak ties theory. Each relationship tie will be qualitatively assessed based on the interviews which have taken place. The network map in Figure 1 shows the 'supply chain' of food surplus which originates in Co-op stores.

Figure 5H: Network analysis of a single supply chain with Co-op as the key node.



5.3.2 Analysis of research question 1

> 13. Are UK supermarkets' food surplus networks comprised of **both strong and weak ties** with social enterprises, governments and other supporting organisations?

5.3.2.1 Co-op and Fareshare

Table 5T: Summary of tie strength between the Co-op and Fareshare nodes.

Tie	Time	Emotional intensity	Mutual confiding	Reciprocity	Overall
Co-op - Fareshare *Relationship 1*	**Low** Little time is spent on the relationship, but this is described as positive as it works smoothly with an agreement in place for collections.	**Medium/High** These relationships require trust in order to work effectively. It has also led to the development of further partnerships, for	**N/A** No requirement for sharing confidential information.	**High** Clear benefits for both sides, with a simple and effective redistribution solution offered to depots with the high social value created	**Strong**

		example in June-July 2023, Unilever donated a product to Fareshare for every two purchased in a Co-op store.		also acknowledged.	
	Evidence *"I don't think it actually involves too much company time in terms of support services, because once an agreement is in place, it's very much just the case that they know when and where to pick it up." (Interview 3, Co-op).*	**Evidence** *"We've got 60+ food bank partners, some of them are connected with FareShare" (Interview 3, Co-op).* *"Again, because the Co-op is very community based, we leave it to whatever the local group wants to do. So we don't have a big partnership that covers the whole area." (Interview 3, Co-op).* *"Key to its success was Fareshare's commitment to helping*	**Evidence** *"Generally, we just don't need to exchange [confidential] information with them" (Interview 5, Fareshare GM).*	**Evidence** *"By working with Fareshare we could give our Distribution Centres a simple consistent solution, which was easy to implement and which would deliver high social value in the regions where they operate." (Co-op, via Fareshare, 2023).* *"Co-op is proud to have worked in partnership with FareShare for the past 10 years to help increase access to food for those who need it*	

		us implement a process that was right for our business and their ability to work at scale in the regions where our distribution centres are based." (Co-op, via Fareshare, 2023). *"Co-op is proud to have worked in partnership with FareShare for the past 10 years to help increase access to food for those who need it the most." (Commercial Director, Co-op, in Unilever, 2023).*		*the most. Our new initiative with Unilever is another fantastic example of cooperation in best practice, bringing brands and businesses together with a shared goal to create a fairer world." (Co-op, in Unilever, 2023).* *"It's a great example of us all cooperating and pulling together to help those most in need and I would ask everybody if they can, to contribute to a food bank near to them." (Co-op, 2020).*	
Fareshare - Co-op *Relationship 1*	**High** Daily deliveries from Co-op to Fareshare from its distribution centres.	**High** Effective working relationship which allows Fareshare to engage throughout the	**N/A** No requirement for sharing confidential information.	**High** Clearly highlighted benefits for both organisations in both cost reduction and from	**Strong**

		supply chain. They work at Co-op’s distribution centres and have been working together since 2015.		a social perspective.	
	Evidence *“FareShare now receives regular and scheduled deliveries from all of Co-op’s DCs.” (Fareshare, 2016).* *“The daily provision of chilled and ambient surplus, alongside the immense support from within the Co-op team, has enabled us to not only continue our work but grow year on year to support more vital frontline organisations.” (Fareshare, 2023).*	**Evidence** *“We work with Co-op and then all down their supply chain as well.” (Interview 4, Fareshare).* *“We work with Co-op’s Distribution Centres (DCs), ensuring edible chilled & ambient surplus is fed to people in need instead of going to waste. In the first year of operating a new FareShare process, Co-op provided over 1 million meals to frontline charities in communities all over*	**Evidence** *“Generally, we just don't need to exchange [confidential] information with them.” (Interview 5, Fareshare GM).*	**Evidence** *“There's a huge benefit to us in terms of the food that's coming in, and us being able to redistribute that, especially when we don't pay for the food. The benefit to the food markets and suppliers is that quite often it's food that would be going to waste, so food that they would be throwing in the bin at a cost to themselves” (Interview 5, Fareshare GM).* *“During the pandemic,*	

	"The very generous support of £1.5 million worth of food from the Co-op will enable the FareShare network to maintain a continued vital food supply line into our charities over a prolonged period of ten weeks." (Co-op, 2020).	*the UK." (Fareshare, 2016).* *"We are incredibly grateful to all the staff at Co-op who have worked with us over the last decade, to help us get the equivalent of 10 million meals to our network of charities and community groups across the UK." (Fareshare, 2023).* *"In the ten years we've been working with Co-op they understand how much further their surplus food can go through our network of 8,500 charities across the UK." (Fareshare, in Unilever, 2023).*		*when demand for FareShare skyrocketed, Co-op spearheaded innovative ways to fundraise, from hosting a virtual concert, to galvanising Co-op members to donate their member points. These campaigns not only helped us expand our operations, it also helped change our ability to connect with the public, and share the impact of getting food out to our network of charities to a much wider audience." (Fareshare, 2023).*	

Fareshare and Co-op have a relationship at the depot level, and less so in the stores, although as the stores are not all owned by one central organisation (some are franchised) there are some relationships in certain stores in addition to this. A project was undertaken in 2015 which enabled Fareshare to create a bespoke solution which worked for Co-op distribution centres. Whilst this was not enforced nationally, it was strongly encouraged, which led to all distribution centres donating surplus to Fareshare and 10 million meals donated over a 10-year period. The ensuing relationship has led to this tie being identified as **strong**.

5.3.2.2 Co-op and The Bread and Butter Thing

Table 5U: Summary of tie strength between the Co-op and The Bread and Butter Thing nodes.

Tie	Time	Emotional intensity	Mutual confiding	Reciprocity	Overall
Co-op - The Bread and Butter Thing *Relationship 2*	**Low** Low time commitment from Co-op as they just need to ensure the food is ready for collection at agreed days and times.	**High** They trust them completely as they do with all of their partners.	**High** Would exchange confidential information with them if needed.	**High** Benefits of the relationship are observed in both directions.	**Strong**
	Evidence	**Evidence**	**Evidence**	**Evidence**	

	"I don't think it actually involves too much company time in terms of support services, because once an agreement is in place, it's very much just the case that they know when and where to pick it up." (Interview 3, Co-op).	*"Yeah, definitely. Yeah. No level of distrust there at all." (Interview 3, Co-op).*	*"Yes [we would exchange confidential information]. (Interview 12, TBBT).*	*"It's just wins all around." (Interview 3, Co-op).*	
The Bread and Butter Thing - Co-op *Relationship 2*	**Medium/High** Relatively high number of hours each week spent on collections and relationship management.	**Medium/Low** There is some trust there but also some hesitancy around advice-seeking and the speed at which things are done. There is also some dissatisfaction with the independent store-level agreements rather than taking a national or regional approach.	**High** Indicated that they would be happy to share confidential information with them.	**High** Benefits of the relationship are observed in both directions.	**Strong**

	Evidence *"Somewhere in the range of 7 or 8 hours a week is spent on the Co-op relationship" (Interview 12, TBBT).*	**Evidence** *"We wouldn't seek advice from them, but they would from us" (Interview 12, TBBT).* *"We do trust them, they are just slow, they're just really slow at everything, that's all. But we trust it will get done eventually" (Interview 12, TBBT).* *"The Co-op, who are supposed to be this kind of non-profit membership thing that brings community together and is leading the way in the environment and all the rest of it, but they have them all go their own way." (Interview 12, TBBT).*	**Evidence** *"Yes [we would exchange confidential information]. (Interview 12, TBBT).*	**Evidence** *"I think it's more weighted towards them but of course we benefit from the food they donate" (Interview 12, TBBT).*	

The Bread and Butter Thing works with Co-op's depots to take any surplus food from them. They do not work directly with stores.

Whilst the emotional intensity score is low in one direction, all other factors remain high which leads to defining this as a **strong tie**.

5.3.2.3 Co-op and Too Good To Go

Table 5V: Summary of tie strength between the Co-op and Too Good To Go nodes.

Tie	Time	Emotional intensity	Mutual confiding	Reciprocity	Overall
Co-op - Too Good To Go *Relationship 3*	**Low** Small amount of time spent on the relationship from the Co-op side as it is mostly collecting food for the magic bags.	**High** Trust based relationship which is clearly valued by Co-op.	**Medium/High** Data sharing has been utilised which would seem to be at least temporarily confidential.	**High** Clearly identified benefits for both parties identified by Co-op, making it a mutually beneficial relationship.	**Strong**
	Evidence *"In terms of Too Good To Go, from what I know of my colleagues*	**Evidence** *"Yeah, trust is there [with Too Good To Go]." (Interview 3, Co-op).*	**Evidence** *"We definitely would have data around food waste and some of that*	**Evidence** *"It's a great way, obviously, for us to be able to report lower*	

	and what they sort of spend their time doing, I wouldn't say it takes up very much time, really." (Interview 3, Co-op).	 *Advertising campaign for Co-op and Too Good To Go, stating that they are proud to be working together. (Co-op, 2023)*	*will be available in our next annual report." (Interview 3, Co-op).*	*food waste numbers, get more revenue in, as well as consumers getting good quality cheaper food. So it kind of just ticks all the boxes and makes consumers happy, makes us happy, makes Too Good To Go happy." (Interview 3, Co-op).*	
Too Good To Go - Co-op *Relationship 3*	**High** High level of time commitment as a grocery account could form the majority of one person's role with some involvement from others too.	**High** The relationship is clearly valued and they would seek advice from Co-op where needed. Whilst there is not a national agreement in place, the relationships they do have seem to work well.	**High/Medium** Stated they would share confidential information with Co-op if needed but also observed that this is not likely to be required.	**High** Strongly identified as a mutually beneficial and reciprocal relationship which benefits both parties.	**Strong**
	Evidence	**Evidence**	**Evidence**	**Evidence**	

	"We have entire grocery teams. One person would take the lead on the Co-op account as well as one or two other smaller brands." (Interview 14, Too Good To Go).	*"Yeah, for sure [we would seek advice from them]." (Interview 14, Too Good To Go).* *"It's a slightly different setup with convenience, because some are centrally run and some are franchised out. So those owners have autonomy over whether they join or not." (Interview 14, Too Good To Go).*	*"We would [share confidential information], but I am not sure if we would need to." (Interview 14, Too Good To Go).*	*"Definitely mutual again with the sustainability goals for them. We bring people into their shops, who then pick up other items and buy other things" (Interview 14, Too Good To Go).*	

The relationship between Co-op and Too Good To Go is highlighted as being slightly different to that of other supermarkets, as the individual franchise owners can decide whether to take part or not, rather than it being a relationship which is established at the head office and automatically applied to all stores.

> *"It's just a slightly different setup with convenience, because some are centrally run and some are franchised out. So those owners have autonomy over whether they join or not." (Interview 14, Too Good To Go).*

For those that do hold the relationship, the evidence above demonstrates that the relationship is valued and operates efficiently, with clear benefits for both parties, leading to its assessment as a **strong tie**.

5.3.2.3 Co-op, Fareshare GM and community organisations

Table 5W: Summary of tie strength between the Co-op, Fareshare GM and community organisations nodes.

Tie	Time	Emotional intensity	Mutual confiding	Reciprocity	Overall
Co-op - Fareshare GM *Relationship 4*	**Low** Small amount of time from Co-op's perspective as they just need to ensure the food is available for collection at the agreed day and time.	**High** Trust based relationship which is highlighted by Co-op. They trust that the food will be collected on the agreed day and time.	**N/A** No requirement for sharing confidential information.	**High** Clear understanding of the reciprocal nature of the relationships between Fareshare GM and supermarkets including Co-op.	**Strong**
	Evidence *"I don't think it actually involves too much company time in terms*	**Evidence** *"Yeah, definitely. Yeah. No level of distrust there at all." (Interview*	**Evidence** *"Generally, we just don't need to exchange [confidential]*	**Evidence** *"It's just wins all around." (Interview 3, Co-op).*	

	of support services, because once an agreement is in place, it's very much just the case that they know when and where to pick it up." (Interview 3, Co-op).	*3, Co-op).*	*information with them" (Interview 5, Fareshare GM).*		
Fareshare GM - Co-op *Relationship 4*	**Medium/High** Time taken in collecting surplus food from Co-op depots three times per week.	**Medium/High** There is trust involved that the Co-op will have the deliveries ready and available for collection three times per week, and relationship management occurs during these collections.	**N/A** No requirement for exchanging confidential information.	**High** Clear understanding of the reciprocal nature of the relationships between Fareshare GM and supermarkets including Co-op.	**Strong**
	Evidence *"We go and pick up from Co-op 3 times a week. That has been set up by our national*	**Evidence** *"Obviously if we didn't do those pick ups, then they'd sort of give them to others. So I suppose*	**Evidence** *"Generally, we just don't need to exchange [confidential] information with them."*	**Evidence** *"There's a huge benefit to us in terms of the food that's coming in, and us being able to*	

	food team" (Interview 5, Fareshare GM). *"The Co-op is a little bit different [to other supermarkets] because we go and pick that up directly. So we have to go first thing every Monday, Wednesday, and Friday to pick it up, and there is time spent at their depot waiting for it to be loaded, and that kind of thing." (Interview 5, Fareshare GM).*	*you could argue in a way that that is relationship management." (Interview 5, Fareshare GM).*	*(Interview 5, Fareshare GM).*	*redistribute that, especially when we don't pay for the food. The benefit to the food markets and suppliers is that quite often it's food that would be going to waste, so food that they would be throwing in the bin at a cost to themselves" (Interview 5, Fareshare GM).*	
Co-op - Community organisations *Relationship 5*	**Low/Medium** Small amount of time taken in gathering items from around the store ready for the collections to take place, Limited time from Co-op as they do	**High** Co-op's focus on store-level agreements allows individual stores to develop relationships with organisations in their local community which	**Low** No requirement for sharing confidential information. The level of information exchange is described as much simpler than that.	**High** Appreciation and understanding of the relationship in both directions as Co-op have been involved in food banks themselves and in other projects.	

	not deliver, all store redistribution is done by collection.	are based on trust. There is also some advice given out to community organisations as they work together in multiple ways.		There is a reciprocal relationship involved.	
	Evidence *“It's food banks or groups coming to us to pick the food up. So it might be the case of having to bag a few things up, or check that the bins are there, or whatever. But from what I would understand it doesn't take up too much company time.” (Interview 3, Co-op).*	**Evidence** *“All the agreements are at store level. So they come in and sign a piece of paper that says the food is now the food bank's responsibility once it leaves the store. The group comes and picks up once a week, and there's not too much in terms of like any kind of big contract between food banks and us, it's all just the local food bank to local stores.” (Interview 3, Co-op).*	**Evidence** *“These days you think everything's got to be, you know, properly signed and documented in a million different places but actually it's a lot of just going into a store, speaking to people, picking things up, and repeat for months and months and years and years.” (Interview 3, Co-op).*	**Evidence** *“I did a podcast back in December for our food bank appeal with 2 colleagues that support their work in Leamington Trussell Trust food bank.” (Interview 3, Co-op).* *“In some of the food banks we have got colleagues there anyway.” (Interview 3, Co-op).* *“The Co-op has a critical role to play in*	

		So yeah, we've definitely got trust with all our partners." (Interview 3, Co-op). *"So yeah, the Co-op again we're very focused on … it's not always about the financial contributions, a lot of the time it's support with … and this is another thing, but with small groups a partner could be about HR support, it could be financial planning support, it's just a very holistic approach we try to take." (Interview 3, Co-op).*		*supporting our members, customers and colleagues, as well as the local communities that our stores sit at the heart of." (Co-op, 2020).*	
Community organisations - Co-op	**Low/Medium** The relationships appear to be simple to	**Medium/High** Trust based relationships have	**Low** No sharing of confidential information	**High** Community organisations clearly	

Relationship 5	set up and operate well once established. This requires some time commitment from the organisations to collect, but it would appear that this generally runs smoothly.	been formed with the organisations and they can also seek advice from Co-op where needed. There could be an issue with communication in some cases due to Co-op having its own collection platform rather than utilising existing ones.	is required.	value the relationships they have with Co-op and have a mutual understanding between them of the reciprocity involved.	
	Evidence *"We went in just to speak to them [Co-op] and then they said yeah, you can come and collect Tuesdays, Fridays – so that's what we do. But that's again our own partnership, but again with that, now we've set that up in place, we just go in. So there's no time really,*	**Evidence** *"Coop, probably two and a half years. So, they're quite long standing. Not much hassle." (Interview 11, Stockport Homes).* *"Maybe it's just the fact that it's not done through Neighbourly, but we just have to speak to store*	**Evidence** *"These days you think everything's got to be, you know, properly signed and documented in a million different places but actually it's a lot of just going into a store, speaking to people, picking things up, and repeat for months and months and years and*	**Evidence** *"Co-op as well I think are quite good with local organisations. I think where people are quite embedded in their communities, and there are some small local stores, effectively one of those people knows each other." (Interview 16, Cracking Good Food).*	

	which is quite good." (Interview 11, Stockport Homes).	*management, and sometimes it's not handed over some of the information, but overall it is a good relationship that we have, but some things may be better, like communication could be a bit better." (Interview 11, Stockport Homes).* *"I think for Open Kitchen it was great to have the local Coop ringing you at 6pm when the kitchen chefs know how to use it all" (Interview 17, Open Kitchen MCR).*	*years." (Interview 3, Co-op).*	*"These [community] organisations are mobilising the social economy to provide avenues for mutual aid that prioritise social values such as sharing and empathy over commercial profit. The supermarket chain Co-op was early to rise to this challenge." (University of Sheffield, 2020).*	

These relationships have all been assessed as **strong ties** as it is clear from the included evidence that each of the parties involved values their involvement. The ties are not heavily time based in both directions, but assessment has been made based on the context of the other three factors and the comments made.

5.3.2.4 The wider network

Looking beyond the core 'supply chain' network for food surplus at Co-op helps to demonstrate a more comprehensive network. In this network map, it shows the wider network around the core one, showing relationships where information is shared rather than just food. This network contains a combination of strong and weak ties, as demonstrated in Figure 5I below.

Figure 5I: Wider network around Co-op, showing information based relationships which support the food waste and surplus supply chain.

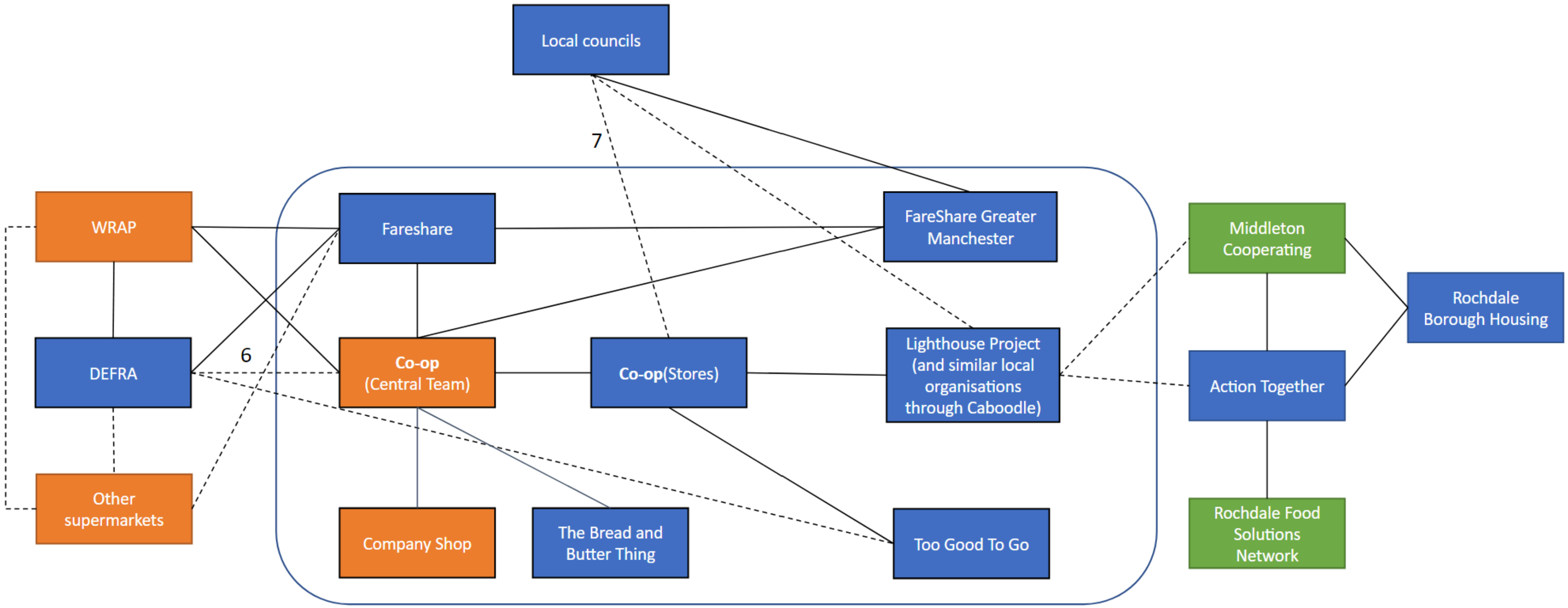


Table 5X: Summary of tie strength between the Co-op, DEFRA, local councils and other supermarket nodes.

Tie	Time	Emotional intensity	Mutual confiding	Reciprocity	Overall
Co-op - DEFRA *Relationship 6*	**Low** This relationship is managed through WRAP primarily, an NGO primarily funded by DEFRA.	**Low** This relationship is managed through WRAP primarily.	**N/A** No requirement for sharing any confidential information.	**Low** This relationship is managed through WRAP primarily.	**Weak**
	Evidence *“The nitty gritty of making those connections and relationships is probably more covered by WRAP.” (Interview 6, DEFRA).*	**Evidence** *“The nitty gritty of making those connections and relationships is probably more covered by WRAP.” (Interview 6, DEFRA).*	**Evidence** *“It’s just more around intelligence sharing and relationship building in the broader sense” (Interview 6, DEFRA).*	**Evidence** It is not common for DEFRA to hold these relationships directly unless there is a specific reason for them to be involved, for example a particular project or funding opportunity (Interview 6, DEFRA).	
Co-op - Local councils	**Low** There is a small amount of time spent on	**Low/Medium** Some engagement at various levels, including	**Low** Worked together on campaigning but no	**Low/Medium** Some low level support and input from both	**Weak**

Relationship 7	engaging with government and local councils but not in any significant or time-consuming way.	lobbying local councils, and some advice seeking, but no emotional or trust-based relationships formed.	sharing of information within that.	directions but not a reciprocal relationship.	
	Evidence *"There is some limited involvement" (Interview 3, Co-op).*	**Evidence** *"We wouldn't rely on any government support for our strategy" (Interview 3, Co-op).* *"With food waste itself, we might have talked to people, but we've done it all ourselves. So yeah, I wouldn't say that we rely on anyone Government wise for our strategy." (Interview 3, Co-op).* *"We have previously supported the Co-op Party's Food Justice Finder, aimed at*	**Evidence** *"We are connected with some people and when it comes to other things, we have links to campaigning and working with MPs and stuff." (Interview 3, Co-op).*	**Evidence** *"We're very supportive of the food strategy - I'm sure there was some influence from us there, but only as a very wide piece rather than being specific." (Interview 3, Co-op).*	

		lobbying local councils to ensure they have a food justice strategy in place." (Interview 3, Co-op).			

5.3.2.5 Co-op and DEFRA

The relationships between DEFRA and organisations such as supermarkets, charities and social enterprises are largely managed through the NGO, WRAP (Waste Resources Action Programme), which means that there is no regular time commitment for this relationship, nor any emotional intensity in day-to-day operations, no requirement for sharing confidential information and whilst Co-op may need to follow the guidance given by DEFRA, there is no reciprocity involved in this relationship, making it a **weak tie.**

5.3.2.6 Co-op and local councils

The local and national relationships with councils and government were discussed, with an emphasis on the store-level managers creating their own relationships and choosing to be involved or not with local council activities. As part of the Co-op political party, they have taken part in campaigning activities, particularly around food justice, but do not rely on the government to support their food waste strategy. As a result, this has been evaluated as a **weak tie**.

5.3.3 Analysis of research questions 2 and 3

14. How do the strong and weak ties within the network effectively enable social enterprises to assist in managing supermarket food surplus, and how does this align with the **food waste hierarchy**?

15. Do **social enterprises** form a key component of UK supermarkets' food surplus networks?

Co-op are a socially-led and driven organisation, with many including cooperatives in the definition of social enterprise (see section 2.2.2). This not only means that Co-op utilises social enterprise as a key part of their food surplus networks, but being one themselves gives them an understanding and insight into the nature and operations of social enterprises, more so than others may have.

Co-op work with Bread and Butter Thing, Fareshare and Company Shop at the depot level, and with various organisations, including Too Good To Go at store level. The store-level agreements are not necessarily national or even regional, and often come right down to individual stores in setting up these relationships, making it difficult to assess the number of organisations within the network (Interview 3, Co-op). It is clear, however, even just from those mentioned here, that social enterprises form a key part of their network.

Co-op directly refers to the food waste hierarchy in their Co-operate report, stating that they use it as a framework to manage their food waste.

> *"In tackling food waste, we follow the food material hierarchy" (Source C, Coop, 2022).*
>
> *The food and drink material hierarchy is core to Co-op's strategic approach. Integrated across the business, it determines best practice, areas of influence, scale of opportunities and team responsibilities. (WRAP, 2020).*

They seek to prioritise source reduction through stock management, and they also categorise their reduced to clear labelling as part of source reduction.

Following this, they follow the hierarchy in order, firstly feeding hungry people through their Co-op Food Share platform (Co-op, 2018), now Caboodle, which allows local charities and organisations to access it, or through national partners from their depots, followed lastly by anaerobic digestion.

> *"Where surplus stock is unavoidable, we ensure that as much as possible is redistributed from store to local food charities, and from depot to national partners, with the remainder being used to make green energy." (Source C, Co-op, 2022).*

This order reflects the hierarchy, and whilst social enterprises are not mentioned directly, they are included in the charities and national partners via the strong ties as detailed in section 5.3.2.

At the feeding hungry people stage, there is a desire to share more with organisations such as food banks, but at times the restrictions around collection timings lead to more food going to anaerobic digestion than perhaps it otherwise might.

> *"Fresh fruit and stuff like that, we want to be able to give to a food bank in order to give it to people in need right there and then, however, as soon as it goes past that 10 pm mark, then it would have to go into the bin to go down the anaerobic digestion route later on." (Interview 3, Co-op).*

This suggests an intention to follow the order of the hierarchy, but demonstrates times when this may not always be possible. This point is discussed in more detail as a barrier in section 5.3.5.

In summary, social enterprises form a key part of the networks surrounding Co-op' food redistribution, in both redistribution from stores and from the depots. Many of these ties are strong, although supported somewhat by weak ties, as identified in section 5.3.2.

5.3.4 Analysis of research question 4

16. Are there any key **facilitating factors** to support the effectiveness of managing food surplus, and do they differ between strong and weak ties?

From the thematic analysis of the interviews from across the actors in the network, the key facilitating factors in the network were identified from the interviews. These interviews took place with mostly strong-tied organisations but with some support from those with weak ties. The facilitating factors discussed within the interviews include the following:

- Use of technology partners;
- Autonomy of individual stores to build relationships;
- Benefits from economic, social and environmental perspectives;
- Utilising wider networks, including both strong and weak ties.

5.3.4.1 Use of technology partners

Co-op has partnered with Microsoft to develop Caboodle, their food-sharing platform. Ownership of this app and the platform allows them to better track their food surplus and the quantities and types of food being distributed, and could also help them with source reduction if there is a particular type of food which is frequently being distributed on the platform in a particular area.

> *"Co-op Food Share [precursor to Caboodle] projects an estimated reduction of 20%-30% of store level food waste, and a reduction in back haul costs." (WRAP, 2020).*

It is also noted by other stakeholders that they have found it helpful for other things such as building a volunteer network to help with food surplus redistribution.

“That is a platform where not only does it allow organisations like supermarkets to put on what food they’ve got available for distribution, it also allows community food providers to ask for certain things as well. It is also a great site for developing that volunteer network we need in terms of logistics and distribution.” (Interview 7, GMCA).

In addition, since 2017, Co-op has partnered with a technology company to also monitor the environmental metrics, including food waste, of their direct manufacturing suppliers, providing them with the tools and resources to do so. This helps Co-op to monitor the actions being taken at the manufacturing level of their supply chain, in addition to the impact of their own stores.

“The Co-op’s ‘’Co-op Future of Food” supplier platform shares best practice, resources and tools to prevent food waste.” (WRAP, 2020).

Overall, Co-op has a clear ideology for their technological investments and the way in which they are keen to build on them in order to support their KPI measurements effectively. This shows that they are able to invest and utilise the available technology to its full potential and are capitalising on their ability to create these partnerships.

5.3.4.2 Autonomy of individual stores to build relationships.

The fact that individual stores have autonomy to build relationships within their own communities which will be most beneficial, is an approach which is valued by many of their stakeholders.

“Co-op as well I think are quite good with local organisations. I think

where people are quite embedded in their communities, and there are some small local stores, effectively one of those people knows each other." (Interview 16, Cracking Good Food).

Rather than having national agreements which may hinder the abilities of smaller local organisations to access the food surplus, the stores have a more flexible approach which allows them to make the best decisions for their own community.

In addition, Co-op places the credit for much of their in-store food waste reduction success in the individual colleagues.

> *"The amount of food waste we generate has decreased by 29% since 2015 [to 2019]. We believe this is due to a considerable amount of colleague time and effort being invested in prevention and diversion to reduce the amount of waste that we send back to our depots from food stores." (WRAP, 2020).*

Placing the autonomy on stores to build these relationships has had a demonstrable impact on the overall reduction figures, allowing for such progress to be made.

5.3.4.3 Benefits from economic, social and environmental perspectives.

Co-op have a clear understanding of the benefits of food waste reduction and redistribution which facilitates the effectiveness of the network.

> *"It's a great way, obviously, for us to be able to report lower food waste numbers, get more revenue in, as well as consumers getting good quality cheaper food. So it kind of just ticks all the boxes and makes consumers happy, makes us happy, makes Too Good To Go happy." (Interview 3, Co-op).*

In particular, the relationship with social enterprise, Too Good To Go, demonstrates an approach which incorporates the value from all perspectives. This is in addition to other stakeholders who have also identified the mutual benefit of food waste reduction, and the focus in the Co-operate 2022 version of the Co-op annual report on helping people and the planet.

From an economic perspective, Co-op is happy to acknowledge the benefits of attaching monetary value to their waste in order to maximise their results.

> *"Attaching monetary value to results is important in a commercial business. It makes us look at wins that are commercially and environmentally beneficial." (Co-op, in WRAP, 2020).*

This acknowledgement demonstrates an awareness of the benefits beyond the financial ones, but also indicates that the economic perspective is indeed an important one to consider.

5.3.4.4 Utilising wider networks, including both strong and weak ties

The network maps shown in 5.3.2 demonstrate a combination of strong and weak ties which Co-op uses to effectively manage food waste. They use a variety of options for food waste redistribution which differs at store and depot level.

> *"Depot teams shared 911 tonnes of surplus food with FareShare, The Bread and Butter Thing and Company Shop in 2022." (Source C, Co-op, 2022).*
>
> *"Because the Co-op is very community based, we leave it to whatever the local group wants to do. So we don't have a big*

partnership that covers the whole area." (Interview 3, Co-op).

"We are connected with some people and when it comes to other things, we have links to campaigning and working with MPs and stuff." (Interview 3, Co-op).

There is evidence which demonstrates this utilisation and how it benefits Co-op throughout this section, with each of these quotes taking into account the wider relationships which are utilised throughout the network. This is also supported by the social enterprises and organisations they work with.

"In the ten years we've been working with Co-op they understand how much further their surplus food can go through our network of 8,500 charities across the UK" (Fareshare, in Unilever, 2023).

This variety facilitates the operation of the network and allows Co-op to maximise their food waste reduction and redistribution, with recent statistics demonstrating a reduction in overall waste figures.

They also work throughout the supply chain, helping to reduce food waste at different stages, such as manufacturing.

"Co-op has been working directly with suppliers to identify, pilot and embed technical interventions that reduce food waste and extend shelf life." (WRAP, 2020).

This includes using the ends of products which may previously have been cut off, for example brownies and flapjacks in the bakery, and vegetables in ready meals. It also includes process redesign to maximise usage, for example by adding mayonnaise to a sandwich before other ingredients, they found that less waste occurred as more of the food was able to adhere to the bread (WRAP, 2020). This demonstrates a commitment to food waste reduction not just in stores but also in other areas of the business.

5.3.5 Analysis of research question 5

17. Are there any **barriers** to the effectiveness of managing food surplus, and do they differ between strong and weak ties?

Again, from the thematic analysis, barriers to the effectiveness of food surplus management within the Co-op supply chain were identified, focusing on three key points. These factors were mainly drawn from interviews with those in strong-tied organisations, supported by those from weak-tied organisations, which will help to understand how the barriers may differ. These are:

- Restricted by sell-by and use-by dates.
- Short turnaround times for food.
- Competing targets and key performance indicators (KPIs).
- Utilising their own platform rather than existing ones.

5.3.5.1 Restricted by sell-by and use-by dates.

One of the main barriers identified by Co-op as a barrier for effective food waste reduction is the restrictions around redistribution based on use-by and sell-by dates on the products.

> *“The only annoying thing is you get that sort of 10pm thing where we can't give it past its use by date” (Interview 3, Co-op).*

This quote indicates that there is a requirement for all food which is to be redistributed to be shared before 10 p.m. on the use-by date to allow the relevant redistribution organisations time to get it to their own service users. This requirement may be limiting the volume which can be redistributed, but on the other hand, this also gives the organisations a very short window within which they can still distribute the food to their service users.

Best-before and sell-by dates operate slightly differently and have a little more flexibility.

> *“Anything that says use by the 10th March, we can't give that out on the 11th March – that's against the law for sure. But yeah, if it's just best before or sell by, then we can.” (Interview 3, Co-op).*

Where use-by dates are set for health and safety reasons, best-before and sell-by dates are not as strict and can be redistributed after the printed dates, allowing more to be redistributed.

This barrier is one which is restricted by health and safety, making it a difficult one to address, but there is certainly scope for more best-before and sell-by-dated products to be redistributed due to the differing requirements surrounding them.

5.3.5.2 Short turnaround times for food.

Another barrier which is on a similar topic is that of the short turnaround times for food surplus and getting it to organisations who can make use of it within a reasonable time frame, and also fitting it within their own guidelines for redistribution.

> *"A lot of these are perishable things too because yeah, there's no point giving them 50 litres of milk for them to only give out 20." (Interview 3, Co-op).*

They also highlight the difficulty in finding the balance between the timing of redistribution in order to maximise its benefit, and the loss of potential revenue, however, which can prove challenging.

> *"So if we were to give all the milk off our shelf to a food bank that's a loss of revenue. So it's about finding a happy balance." (Interview 3, Co-op).*

This balance has proven challenging to address, particularly in the context of the cost-of-living crisis where people are keen to find bargains in the reduced price stock sections, leaving less for redistribution but producing revenue even where this is lower than usual.

5.3.5.3 Competing targets and key performance indicators (KPIs).

Finding that balance of short turnaround times and increased revenue continues to be a challenge, with KPIs for increased surplus donations and reduced waste which are directly competing with each other.

> *"We will reduce food waste generated by our stores and depots by 50% by 2030, compared to 2022." (Source C, Co-op, 2022).*
>
> *"Building on this [increase in food donations] will be a priority in 2023 as we ensure we focus on preventing food being wasted in the first place and maximising the amount of surplus food we can share." (Source C, Co-op, 2022).*

These KPIs work against each other, as higher levels of prevention will leave less surplus food to be shared through redistribution channels.

This is a barrier which is difficult to address without also assessing the overall volumes of food waste reduction and surplus redistribution holistically. If the KPI around food waste reduction is successfully met, and less is available for redistribution, this would still be a success despite the secondary KPI not necessarily being met, hence the difficulty in their assessment.

One initiative which has helped Co-op to navigate this is through their 2023 partnership with Unilever and Fareshare, where Unilever donates one product to Fareshare for every two sold in store. This applies across food, personal care and household items.

> *"Unilever has partnered with Co-op and FareShare to donate a range of products across its homecare, personal care and food portfolios to*

> *support local communities amidst the rising cost of living in the UK." (Unilever, 2023).*

The reasoning behind this partnership is the cost-of-living crisis in the UK (House of Lords, 2023), but this allows more to be donated to Fareshare without having to overorder stock, or risk higher levels of waste from products with short turnaround times. This allows the two KPIs to work in tandem where both can be achieved to some extent, despite the donations not being surplus.

5.3.5.4 Utilising their own platform rather than existing ones.

Less of a barrier for Co-op but more for the organisations working with them, it has been noted in the interviews that whilst Co-op are a good partner to work with, it is sometimes the case that having its own separate platform is more of a barrier to an effective working relationship, and can occasionally affect communication in both directions.

> *"Maybe it's just the fact that it's not done through Neighbourly, but we just have to speak to store management, and sometimes it's not handed over some of the information, but overall it is a good relationship that we have, but some things may be better, like communication could be a bit better." (Interview 11, Stockport Homes)."*

This highlights that whilst having a separate platform can be good for Co-op itself, it may not be the best for all stakeholders if they are already operating on another platform. This is, therefore, both a facilitating factor and a barrier in different ways.

5.3.6 Analysis of research question 6

18. What are the key **motivations** of food waste reduction stakeholders to partake in the network?

The motivations for Co-op to engage in food waste reduction are multifaceted, with focus across economic, social and environmental factors.

Economic factors are clear, with the Co-op operating as a business, the requirement for profit maximisation is essential. They will always prioritise the financial aspects of food waste reduction, mostly in their stock management and reducing the amount wasted at the source, followed by reducing the cost of products in store to still gain something financially from them, and then redistribution to charities follows this.

> *"It's just sell first and food banks second" (Interview 3, Co-op).*

This emphasises the economic motivations of the Co-op, but there are, in fact, many ways in which they also prioritise social and environmental factors.

One motivation outlined by Co-op which highlights their social and environmental focus, is their use of the responsible business tracker from Business in the Community (BITC, 2023), and their particularly high score on it compared to other supermarkets. The tracker is an extensive form which tracks a number of metrics, including international supply chains, use of transport for food and utilisation of food waste.

" I think we are one of only 2 companies to achieve a 90%+ score on that [the responsible business tracker]." (Interview 3, Co-op).

This achievement is a clear motivation for them to stay ahead in the tracker and continue to improve on each of these metrics, including food waste utilisation.

Working with food banks and local organisations, and giving stores the flexibility to develop their own agreements and partnerships, also demonstrates the social motivations of Co-op, enabling stores to understand the needs within their local area. They also support the National Food Strategy.

"There's a national food strategy which we're very supportive of which looks into the entire food system reducing the very most impact of that, of course, including the producing and stocking of food, reducing food waste. eating healthier, and giving food to those in need." (Interview 3, Co-op).

They also provide support in other ways to the smaller organisations they work with, offering guidance and advice in addition to food and financial support, and also assist in setting up community fridges in areas which could benefit from them.

"It's not always about the financial contributions, a lot of the time it's support with other things, but with small groups it could be about HR support, it could be financial planning support, it's just a very holistic approach we try to take." (Interview 3, Co-op).

"There's an overarching organisation called Hubbub who work with the Co-op and they have funding provided to them and do the set up in terms of the [community] fridge freezers." (Interview 7, GMCA).

This is also a demonstration of commitment to their social impact and their motivations surrounding this, as they are not simply offloading their surplus food to these organisations but also helping them with their business operations too.

Environmentally, it is acknowledged that the impact of food waste reduction is also an environmental factor, as it is part of the ‘planet’ strategy in the annual report.

> *“This encourages us to build on existing environmental work and deliver further reductions in both greenhouse gas emissions and food waste” (Interview 3, Co-op).*

This acknowledges that food waste is indeed an environmental issue and the reduced greenhouse gas from food waste is also beneficial to the planet.

> *“In the ten years we’ve been working with Co-op they understand how much further their surplus food can go through our network of 8,500 charities across the UK.” (Unilever, 2023).*
>
> *“As a cooperative, we're very keen on becoming as sustainable as possible.” (Interview 3, Co-op).*

Overall, Co-op demonstrates an approach encompassing economic, social and environmental motivations, as evidenced throughout this section.

5.4 Cross-case analysis

Here, each research question will be taken in turn, including a short summary supported by a longer discussion which compares the cases from the previous section. This will offer an insight into the networks as a whole, the similarities between cases and the differences between them. These comparisons will help in understanding the wider UK supermarket food surplus networks and their nuances in line with Granovetter's theory.

5.4.1 Research question 1

1. Are UK supermarkets' food surplus networks comprised of **both strong and weak ties** with social enterprises, governments and other supporting organisations?

Key themes:

a. Time
b. Reciprocity
c. Mutual confiding
d. Emotional intensity

Summary:

UK supermarkets' food surplus networks comprise both strong and weak ties with social enterprises, governments and other supporting organisations. There is a differentiation to be made between the ties where physical product (in this case, food) is exchanged and those which are not directly involved in the food surplus supply chain. The strongest network ties are generally those between organisations where food exchange is involved, indicating that weak ties are not sufficient for this purpose. This is supported by several quotes detailed throughout this chapter.

Reciprocity and emotional intensity seemed to be the most valued factors in these relationships, with time and mutual confiding being less central to their effectiveness, mostly due to an absence of requirement in both cases. For time, it was generally indicated that the less time spent on the relationship, the stronger it was considered to be in the context of this particular network.

In each of the three cases discussed in sections 5.1, 5.2 and 5.3, the unique ties within each network map were analysed and evidenced. Those ties which were omitted from these analyses, which are common across the cases and are independent of each individual supermarket, are first included in Table 5Y below.

Table 5Y: Summary of common ties which are independent of individual supermarkets.

Tie	Time	Emotional intensity	Mutual confiding	Reciprocity	Overall
Fareshare GM - Community organisations	**High** Multiple job roles in Fareshare GM dedicated to managing these relationships, totalling around 160 hours per week. This includes around 240 organisations, benefitting approximately 35,000 people per month (Interview 5, Fareshare Greater Manchester).	**High/Medium** Would seek advice if needed, more likely to be the community organisations seeking the advice from Fareshare GM rather than the other way around. Fareshare GM has been in place since 2008, working with local community organisations.	**N/A** No requirement for sharing any confidential information.	**High** Community organisations get the food they need and Fareshare from a social perspective are able to be the intermediary to facilitate the food getting to those who need it, which is their core mission.	**Strong**
	Evidence *“It is quite a specialised role knowing the groups, and it comes with time, like you can't come in on day one knowing what*	**Evidence** *“I'd say that we do trust them. Anyone we don't trust we can be quite reactive to do an inspection and see what's happening and*	**Evidence** *“The need [to share information] doesn't really present itself that much.” (Interview 5, Fareshare GM).*	**Evidence** The key to the effectiveness of this is in building relationships with each one and understanding what kind of food they	

	everyone wants, because even groups that are quite similar in what they're running might have very different needs." (Interview 5, Fareshare GM). *"That would be across doing orders, my actual management of relationships, FareShare Plus and the warehouse dealing with customers when they come to collect." (Interview 5, Fareshare GM).*	*make sure that any issues are rectified. And generally, when I have said to people I want you to start doing this and I'll check in in 3 weeks to see how you're getting on, it's always fine. I would say that perhaps there's a slightly lower level of trust in us, just because we are quite stretched in terms of our staff resources." (Interview 5, Fareshare GM).* *"So it's just about getting to know them over time, and most groups we deal with over the phone, we don't just guess what they want." (Interview 5, Fareshare GM).*		require. This can be based on consumer demographics, location-based demographics or simply understanding the organisation and what it does, including its limitations, for example availability of refrigerator or freezer space (Interview 5, Fareshare GM).	

		"Occasionally we might seek advice from them if they know the area a bit better than us or if they're working in quite a specialised area like homelessness, or rough sleeping, things like that." (Interview 5, Fareshare GM).			
Community organisations - Fareshare GM	**Low/Medium** Mostly done through a technology platform or mobile app and the only time commitment is in collecting the food which is a quick process.	**High/Medium** They trust them to deliver on agreed actions generally but much of it is app based. Fareshare GM has been in place since 2008, working with local community organisations.	**N/A** No requirement for sharing any confidential information	**High** Fareshare GM are part of a wider sharing economy organisation, so having people come to collect food raises awareness of this and can help people direct their service users to them where required.	**Strong**
	Evidence	**Evidence**	**Evidence**	**Evidence**	

	"We meet them [Fareshare] once a week and probably have quite regular phone calls, so quite a lot. Not daily, maybe just weekly." (Interview 11, Stockport Homes). *"Twice a week there's a delivery, which means that two or three people will offload from the FareShare van into our loading bay, bring it through the centre to the project, check it against the delivery notes and then sort it and stock the shop with it." (Interview 15, Lighthouse Project).*	*"[When there is too much surplus it was passed to Fareshare], but actually, that worked really well in our favour, because they saw that as a very positive step from us and then they looked after us. You know how it is, people respect tip offs and whatever." (Interview 16, Cracking Good Food).* *"Neighbourly and FareShare work quite a lot with all these supermarkets. So if I need any advice, I'd go to Neighbourly or FareShare, more so than the specific supermarket." (Interview 11, Stockport Homes).*	*"Not really relevant – it's more like surveys on the whole, rather than confidential information." (Interview 11, Stockport Homes).* *"I don't think there would be any occasion where that [confidential information] would arise." (Interview 15, Lighthouse Project).*	*"So around 50% of our food for each pantry comes from FairShare so the benefit with that is that obviously it's tackling food waste, and with FareShare, you spend £1 but you get £20 worth of food back." (Interview 11, Stockport Homes).* *"I think it definitely benefits us maybe a little bit more because obviously, we're getting the food and I know how busy they are but, because the pantries are a big national organisation, I think it definitely benefits them." (Interview 11, Stockport Homes).*	

		"I do trust them with the actions and stuff like that, and they would give us the heads up if there's not enough food." (Interview 11, Stockport Homes). *"One in five charities say they would have to close if FareShare stopped providing food, and over 80% of users who ate a FareShare meal said it made them feel closer to their community." (Vocovo, 2020).*		*"Reciprocally, yeah. It's well balanced." (Interview 15, Lighthouse Project).*	
DEFRA - Fareshare	**Low/Medium** During the funding period there was much more time involved, but not on a regular basis.	**Low** Focused on funding which was received by Fareshare from DEFRA.	**High/Medium** As part of the funding arrangement, regular updates and data were shared from	**High** Fareshare receives the funding for work which helps to achieve DEFRA's targets.	**Strong**

			Fareshare, this is only one-way.		
	Evidence *"For example, we don't do our own research and publish reports – our public affairs department is me." (Interview 4, Fareshare).*	**Evidence** *"We've not done any policy development with the government. We write submissions to the budget and try to engage into the official processes that they want us to, but we don't develop policy." (Interview 4, Fareshare).* *"We don't have a big team of policy wants or anything like that, but we are getting slightly more engaged on that side of things" (Interview 4, Fareshare).*	**Evidence** *"It's just more around intelligence sharing and relationship building in the broader sense." (Interview 6, DEFRA).*	**Evidence** *"DEFRA has made around £12 million of grants available since 2018 to directly support redistribution organisations." (Interview 6, DEFRA).*	

Fareshare GM - local councils	**Low** They worked together during the pandemic and both attend some of the same network meetings, but nothing regular.	**Low** Currently the relationship is very minimal.	**Low/Medium** No requirement for sharing any confidential information, but they do share relevant data to local authorities.	**Low** Currently the relationship is very minimal.	**Weak**
	Evidence *“I would like to do more with the combined authorities and local companies but it's about working out how we can do that effectively rather than just doing it for the sake of doing it.” (Interview 5, Fareshare GM).* *“We go to meetings with council and people like Stockport Food Strategy.” (Interview 5, Fareshare GM).*	**Evidence** *“I think overall local authorities value what we do and not only the kind of food service but also the fact that we are like a datapoint as well.” (Interview 4, Fareshare).* *“At the moment, we're not doing too much, and there's not any sort of level of support in terms of finance from the Government.” (Interview 5, Fareshare GM).*	**Evidence** *“So I think for us from a local authority perspective, we definitely help give feedback, data reference points on what our memberships are doing, key issues around our membership, definitely give them more insight into that.” (Interview 4, Fareshare).*	**Evidence** *“I've definitely seen policy shaped as a result of that [data].” (Interview 4, Fareshare).* *“If they're not doing that much in the way of food provision, there’s not much we're able to do with them.” (Interview 5, Fareshare GM).*	

Community organisations - local councils	**Low/Medium** Action Together holds meetings with some community organisations in order to understand and better help with supporting them. Generally done through initiatives such as the food warehouse which is run via an app.	**Low/Medium** Little trust is required except in providing the requested food. The network meetings support the process and are useful to increase understanding from both parties. Also some funding is provided through councils.	**N/A** No requirement for sharing any confidential information.	**Low/Medium** Currently quite a one-way relationship where the community organisations get the food from the warehouse at a low price.	**Weak**
	Evidence *"I'd say very little [time is spent], actually. I think that's a relationship that needs developing." (Interview 15, Lighthouse Project).*	**Evidence** *"Because that was my concern you know, three weeks in and I'm thinking well, this is all covered, people are already doing this – organisations and supermarkets and retailers and that, but now I'm also thinking a little bit wider and*	**Evidence** *"It just obviously depends on what that confidential information is. But yeah." (Interview 11, Stockport Homes).*	**Evidence** *"I don't know a lot about the council, but I presume the council will have [had input on national policy], or whatever." (Interview 11, Stockport Homes).* *"So, because we get our grants from Rochdale Council and*	

		thinking of local restaurants or cafes or what goes through the school system, so statutory organisations, what goes to the hospitals and you know, is there any way of tapping into places like that." (Interview 9, Action Together). *"We are very close to the council, which is really good, and we work with them in every sense, so obviously the housing and tenants and communities, community spaces, community like buildings, pantries. Yeah, so we work really closely with them and it's a really great*		*Public Health, the monies come via that route, there's sort of another layer to it, you know as well, really, in terms of Rochdale because they give us the grant, we've got to report back to them how we use that grant to support the foundation, the network and the warehouse." (Interview 9, Action Together).*	

		relationship." (Interview 11, Stockport Homes). *"We get some funding from Rochdale Council." (Interview 15, Lighthouse Project).* *"We would seek advice from the council but don't necessarily trust them to deliver on agreed actions." (Interview 15, Lighthouse Project).*			
Community organisations - local network groups	**Low** Infrequent meetings, sometimes monthly or quarterly.	**Low/Medium** Useful to understand wider context and develop new links and contacts through the networks.	**N/A** No requirement for sharing any confidential information.	**High** Useful to be part of a network to share ideas and gain further ideas and support from the network.	**Weak**
	Evidence *"I'd like it to be better. But some of that is*	**Evidence** *"We do work with the Stockport Food*	**Evidence** *"Not really relevant – it's more like surveys*	**Evidence** *"It's a really good network to kind of*	

	about organisational capacity. In small understaffed charities, you spend a lot of time running what you do and keeping on top of it. And although from my perspective, I'd like to see more networking and more engagement and other things practically often people don't have the time for." (Interview 15, Lighthouse Project).	*Network, and in that we are part of the massive WhatsApp group. So if there's anything that is in surplus then we would put it on there and say look, we've got loads of baked beans or whatever, then we'd share it amongst each other which works really well." (Interview 11, Stockport Homes).* *"Nice to feel like you're in the same position and that you're not on your own." (Interview 11, Stockport Homes).*	*on the whole, rather than confidential information." (Interview 11, Stockport Homes).*	*discuss what's going on in the bigger picture. But again, some partnerships can be made through that." (Interview 11, Stockport Homes).* *"I'd say there's mutual benefit, yeah." (Interview 15, Lighthouse Project).*	

5.4.1.1 Fareshare and DEFRA

Fareshare were given some funding by DEFRA, firstly in 2018/19 to support farmers to pick, pack and transport their surplus food in order to get it to charities, and again during the pandemic to help support with food poverty issues, getting more food into the charity sector. They are currently bidding again for more funding to continue the work with the farming sector. During a funding period, Fareshare works closely with DEFRA in order to ensure they are on track and meeting the requirements of the agreed funding. Outside of this, however, there is a limited relationship which involves lobbying or policy work or reporting, mostly due to the fact there is not enough staff in place to support this kind of work on an ongoing basis. They instead prefer to invest in roles which support the redistribution of surplus food, their main goal.

> *"Our public affairs department is me. We don't have a big team of policy wants or anything like that, although we are getting slightly more engaged on that side of things. We are a very practical charity so we are very mission focussed on getting food from industry and getting it to charities. We haven't done too much stuff that has strayed away from that core mission." (Interview 4, Fareshare).*

This relationship is quite omnidirectional and only comes into play during funding periods. However, during this time the relationship would appear to be strong based on the evidence shown; it is fairly reciprocal, Fareshare receives funding and this helps DEFRA to work towards their own goals. For this reason, on balance, the tie has been assessed as **strong**.

5.4.1.2 Fareshare GM and local councils

This relationship between Fareshare GM and the local council is also fairly minimal, they worked together during the pandemic and they attend some of the same network meetings, but there is nothing on an ongoing basis. Fareshare GM are again, a very practically focused charity and social enterprise, focusing on their goal, and accepting that the councils are not in a financial position to invest too heavily into food provision, surplus food and food poverty.

> *"I think, just because local government is chronically underfunded, they can't sustainably do food provision."*
> *(Interview 5, Fareshare GM).*

Again, due to low ratings across all four factors, this is a **weak tie**.

5.4.1.3 Community organisations and local councils

Action Together, through Rochdale Council, provided a food warehouse during the pandemic to further help with supporting charities during this time. It is still in operation and they are hoping to continue with it, if it can be made sustainable in terms of funding. This is operated via a mobile app which charities could use to place orders and then collect from the warehouse. Outside of this, they also have a committee which represents various sectors, including food waste and redistribution, to help the council understand and collaborate on issues, and to aid in creating network links between organisations who attend. This is not an open meeting but is made up of a membership. This means that other organisations may not collaborate as much as others, and for this reason, it is classified as a **weak tie** overall.

5.4.1.4 Community organisations and local network groups

Local network groups have been increasingly useful in creating networks and fostering relationships within the sector. These can be regional, such as the Greater Manchester Food Security Action Network, or more local, such as specific ones for Rochdale, Middleton or Stockport. They provide opportunities to hear from others in the sector, perhaps local government, supermarkets, think tanks, NGOs etc, and learn from each other.

> *"Through Middleton Co-operating, we're looking at what we can do together. The aim of that is to have an impact on the things that are of most importance in people's day-to-day lives." (Lighthouse Project, Interview 15).*

Again, these are useful connections which may lead to the creation of strong ties, but as part of the network, they remain **weak ties**.

5.4.1.5 Summary

In summary, it is clear from these tables and from those included in the three cases in 5.1, 5.2 and 5.3 that whilst there is indeed a combination of strong and weak ties included in the networks, there is a divide between those which are core to the movement of the food and those which support that movement. The central ties which are utilised in **exchanging food** are mostly **strong ties**, and those which **do not involve the food** itself are mostly **weak ties**.

In the context of Granovetter's theory, this will be assessed in more detail throughout this section. Each of the eleven propositions will be taken within the context of the six research questions and discussed in relation to the three cases included in this study.

5.4.1.6 Time

PROPOSITION 1

The more time spent together (both frequency and duration), the stronger the tie.

This proposition has no clear evidence either way, with some relationships supporting it and some refuting it. This implies that it is a much more nuanced category than a simple quantitative high or low approach allows for.

Whilst Granovetter's (1973) theory states that "stronger ties involve larger time commitments" (p.1362), this research has suggested that this may not always be the case. For many of the relationships analysed within the three case studies (Tesco - relationships 1, 2, 3, 5; Morrisons - relationships 1, 4, 5; Co-op - relationships 1, 2, 3, 4, 5), it was considered that the time spent on the relationship was low, with only a small amount of time required to maintain it, yet this was seen positively by those involved.

For example, it was indicated, particularly by Co-op (Interview 3) - *"I don't think it actually involves too much company time in terms of support services, because once an agreement is in place. it's very much just the case that they know when and where to pick it up"* - but in all three cases and by social enterprises such as Lighthouse Project (Interview 15) - *"there's only phone calls when there are issues"* - that if more time were to be required, this would generally mean that there was a problem or issue in the relationship. This refutes this proposition and therefore Granovetter's theory that the more time spent on the relationship, the stronger it is.

Particularly for Co-op in the third case, it was observed that whilst the time factor was low on their end, it was often the case that more time was spent on the relationship by the social enterprises and other nodes - *"it's a lot of just going into a store, speaking to people, picking things up, repeat for months and months and years and years"* (Co-op, Interview 3). The fact this is consistent across the three cases, and within many of the relationships within them as identified, demonstrates that this is not an isolated occurrence and is a pattern across all three. From the point of view of social enterprises, much of the time invested is in operational aspects of the relationship such as collecting and distributing the food, which allows the relationship itself to remain strong - *"let's say 160 [hours per week] in the end, so that would be across doing orders, my actual management of relationships, FareShare Plus and the warehouse dealing with customers when they come to collect"* (Fareshare GM, Interview 5); *"we do have people within the business who specifically focus on that account [Morrisons] and it's their entire role here"* (Too Good To Go, Interview 14). The duration of organisational time dedicated to the relationship is therefore often asymmetrical, often as a result of the operational aspects of the relationship and the nature of the organisation. This does not have an impact on the overall assessment of the tie as strong or weak.

For some, as demonstrated, there was a high amount of time invested in the relationship, either collecting food, maintaining the relationship or otherwise in communication, which would support the proposition (Morrisons - relationships 2, 3; Co-op - relationships 1, 2, 3, 4). This was noticeably omnidirectional in Co-op's cases, where the time investment was higher on the part of the social enterprises and community organisations, whilst for Morrisons, this was bidirectional for the two relationships referenced, yet in both cases these relationships were classified as strong - *"I would say probably an hour a day [per store], putting it all together [for the Too Good To Go boxes]"* (Morrisons, Interview 2). This supports the assertion that the time factor is of low importance to the classification of a tie as strong or weak independently, but must be taken alongside other factors (Prell, 2012).

As a result, it was important to understand the context of the 'time' factor, allowing the interviewees to expand upon their answers to better interpret their meaning. This meant that where relationships had a 'low' rating on the time factor, this rarely had an impact overall on the strong or weak assessment, as the context was taken to be more important than the numbers themselves, hence the importance of utilising a qualitative approach in this research.

For Granovetter's theory, this would imply that the time factor has little impact on the strength of the tie overall and that other factors may be more important to take into account when assessing tie strength. The wider context of the time factor should be taken into consideration, aligning it with the other factors and understanding responses using the qualitative explanations. This enables a more comprehensive understanding of the time factor than a simple high-low scale would, improving insights into the tie on a more holistic level than as four independent factors.

5.4.1.7 Emotional intensity

PROPOSITION 2
The higher the emotional intensity score, the stronger the tie.

Emotional intensity has indeed shown some consistency with the overall tie strength. When the score on emotional intensity is analysed as high, the tie is often evaluated as a strong one (Tesco - relationships 1, 2, 3, 4, 5; Morrisons - relationships 1, 2, 3, 4, 5; Co-op - relationships 1, 2, 3, 4, 5), and the same is true in reverse, where emotional intensity is low, they are often weak (Tesco - relationships 6, 7, 8; Morrisons - relationships 6, 7, 8; Co-op - relationships 6, 7).

Interestingly, the length of time that a relationship has been in place across all ties, whilst clearly also associated with time, was also considered by many interviewees as a sign of emotional intensity and their ability to trust each other, so the two factors seem to be linked in this way (Tesco - relationships 1, 2, 3; Morrisons - relationships 1, 2, 3, 4; Co-op - relationships 1, 5). Where time was discussed in section 5.4.1.6 in terms of daily or weekly time spent in communication, it was the emotional intensity questions around trust where interviewees referred back to the overall length of the relationship as their justification for their answers - *"all these relationships have been forming for like 6 years or longer"* (Interview 1, Tesco); *"I definitely trust them, yes. I've built up a nice friendship over the years with the two ladies that run it, a really nice friendship."* (Interview 2, Morrisons); *"Our longest-standing supermarket partner* *is Morrisons. They've been with us for several years now."* (Interview 14, Too Good To Go); *"The [Morrisons] sustainability team have known me [TBBT] for a very long time and they trust us"* (Interview 12, TBBT). This supports the findings noted in section 2.3.3.2.2 from Roberts and Dunbar (2011), who identified a direct link between the time and emotional intensity involved in a relationship.

Levels of trust, along with the ability to seek advice from one another were two key factors in assessing emotional intensity (Gilliland and Bello, 2002). In the strong ties, these factors tended to be discussed positively (Tesco - relationships 1, 2, 3, 4, 5; Morrisons - relationships 1, 2, 3, 4, 5; Co-op - relationships 1, 2, 3, 4, 5) - *"Yeah, definitely. Yeah. No level of distrust there at all."* (Interview 3, Co-op); *"Yeah, for sure [we would seek advice from them]."* (Interview 14, Too Good To Go).

In some of the weak ties, however, there was much less of a tendency to seek advice from each other, and trust was not involved (Tesco - relationships 6, 7, 8; Morrisons - relationships 6, 7, 8; Co-op - relationships 6, 7) - *"I would feel it's [seeking advice] not the right thing for me to do."* (Interview 2, Morrisons); *"We wouldn't rely on any government support for our strategy"* (Interview 3, Co-op). There are also legalities in place which must be considered in the development of some relationships, such as those between different supermarkets, which means they will remain weak ties - *"When we work with other suppliers or supermarkets and suppliers to be fair, we're very careful not to infringe on GSCOP"* (Interview 1, Tesco).

This is in line with Granovetter's theory and in line with the proposition, and therefore this study supports the idea that emotional intensity is a key factor in determining the strength of a tie.

5.4.1.8 Mutual confiding

PROPOSITION 3
The higher the score for mutual confiding, the stronger the tie.

Confiding in each other and the sharing of confidential data was perhaps one of the areas with less significance in this network. Almost all of the participants explained that there was no need or requirement to share any confidential data, as the nature of the work did not warrant such sharing (Tesco - relationships 2, 3, 5, 6, 7, 8; Morrisons - relationships 2, 4, 5, 6, 8; Co-op - relationship 1, 4, 5) - *"Generally, we just don't need to exchange [confidential] information with them"* (Interview 5, Fareshare GM); *"I don't know that there is any confidential information that's of interest to either party really."* (Interview 15, The Lighthouse Project).

For those who did respond, the answers tended to be more hypothetical than reflective of actual practice, with some saying they would if the need arose. This assisted in determining tie strength but where respondents cited no requirement to do so, this was not taken as a negative factor in the relationship (Tesco - relationship 3; Morrisons - relationships 5, 7; Co-op - relationship 2, 3). For example - *"There isn't a need [to share confidential information], but I would definitely say I could. I would, if*

I needed to. But there really isn't ever a need." (Interview 2, Morrisons); *"We would [share confidential information], but I am not sure if we would need to."* (Interview 14, Too Good To Go); *"Yes [we would share confidential information with them], but it isn't really needed"* (Interview 13, Olio).

Some organisations did state that confidential information is shared, but this was a very limited number (Tesco - relationship 1; Morrisons - relationship 1, 2, 3). For example - *"We'll create joint assets and stuff like that and have really clear project plans and ensure that things are delivered to a really high quality."* (Interview 14, Too Good To Go); *"We have reports going to and back from FareShare saying this is how much we think we've donated to you" (Interview 1, Tesco)*. Whether this factor was present or not, did not seem to impact the strength of the tie, nor did it impact how the individuals rated the tie themselves. Where there was no requirement for confidential information sharing, ties could still be rated highly by the interviewees. For example, in Tesco relationship 5, with community organisations, one organisation stated *"No we wouldn't need to do that"* (Interview 16, Cracking Good Food), yet the tie is still assessed as strong based on the other factors involved.

Due to the nature of the voluntary agreements which all main UK supermarkets have signed, they are strongly encouraged to publicly disclose their data on food waste via their annual reports or sustainability reports, thus eliminating the need for confidentiality within the network - *"We definitely would have data around food waste and some of that will be available in our next annual report."* (Interview 3, Co-op). For the social enterprises who work directly with consumers, should any personal information be collected, they would keep this internally, as there would be no benefit gained from sharing this with other organisations.

For Granovetter’s theory, as is evident from the three cases, the concept of mutual confiding was somewhat redundant in this network, as it had little impact on tie strength. It can be argued that a tie could still be assessed as strong without sharing confidential information with one another, based on the contextual information taken from this.

5.4.1.9 Reciprocity

PROPOSITION 4

The higher the score on the reciprocity scale, the stronger the tie.

Many of the relationships which were studied as part of this research were described as reciprocal, with clear benefits for each node involved (Tesco - relationships 1, 2, 5; Morrisons - relationships 1, 2, 3, 4, 5, 7; Co-op - relationships 1, 2, 3, 4, 5). This includes the relationship between Tesco and Fareshare for example - *“We give food to them and stuff, but they've come into Tesco's directly and talked about their organisation, what they do, and how they try and manage food waste”* (Interview 1, Tesco); *“The partnership with FareShare is a core element of Tesco’s Little Helps Sustainability Plan, and quite simply, FareShare could not do what we do without Tesco’s incredible support!”* (Fareshare, 2023); *“There's a huge benefit to us in terms of the food that's coming in, and us being able to redistribute that, especially when* *we don't pay for the food. The benefit to the food markets and suppliers is that quite often it's food that would be going to waste, so food that they would be throwing in the bin at a cost to themselves"* (Interview 5, Fareshare GM). Each of these quotes provides evidence of where reciprocity can have a direct impact on the strength of a tie, as it is triangulated across the organisations involved. This is similarly the case with Morrisons and Too Good To Go, which demonstrates consistency across multiple cases - *"I'd say it's probably quite equal really. It's good for us and it's good for them, isn't it?"* (Interview 2, Morrisons); *"Yeah, definitely mutual. We provide a lot of sustainability reporting that a lot of other businesses who are within the food saving field just aren't able to, so they get that benefit. We get the benefit that we have such a great partner with us that attracts more users to use us."* (Interview 14, Too Good To Go).

No omni-directional strong ties were described as one-way, or with one node gaining more from the tie than the other in this research. Where there were conflicting responses over reciprocity, the ties were evaluated as weak on at least one side (Tesco - relationship 3, 6, 7, 8; Morrisons - relationships 6, 8; Co-op - relationships 6, 7) - *"It's more for the benefit of the community than it is for the benefit of the companies or themselves."* (Interview 2, Morrisons); *Wherever charities are unavailable, have to cancel, or aren't capable of taking certain food types or quantities, Olio volunteers are called up to collect."* (Olio, 2023).

Reciprocity was often cited as one of the key aspects of strong ties and was seen as one of the most important factors when considering the strength of the relationships -

“It's just wins all around.” (Interview 3, Co-op); *“Definitely mutual again with the sustainability goals for them. We bring people into their shops, who then pick up other items and buy other things”* (Interview 14, Too Good To Go). It is indeed the case that from each table throughout section 5, reciprocity is consistently assessed as high in each of the strong ties.

For this network, reciprocity is therefore seen as a key aspect of strong ties (Friedkin, 1990; Pervan et al, 2011). This is supportive of Granovetter’s theory that reciprocity is one of the key factors in strong ties, and also supports the proposition.

5.4.1.10 Summary

In summary, emotional intensity and reciprocity were identified as much more significant factors in determining the strength of the ties in this network, with time and mutual confiding being less important. In the absence of high levels of time and mutual confiding, ties could still be assessed as strong in light of their discussions on the topics of emotional intensity and reciprocity. Still, the same could not be said in reverse. This implies that such networks rely on the development of emotional intensity and the notion of reciprocity to establish their strong ties and effectively redistribute food surplus and waste.

5.4.2 Research question 2

2. How do the strong and weak ties within the network effectively enable social enterprises to assist in managing supermarket food surplus, and how does this align with the **food waste hierarchy**?

Key themes:

a. Food waste hierarchy

Summary: UK supermarkets, whether directly or indirectly, adhere to the order of the food waste hierarchy when choosing how to redistribute food. Within this, there is a further breakdown which is referred to almost like a 'tier' system between the organisations themselves and who they redistribute the food to. The first tier is redistribution at no cost to the consumer, including organisations such as food banks, and the second is at a very low cost to the consumer, to assist them with integrating back into purchasing food, such as the pantry model.

5.4.5 Food waste hierarchy

PROPOSITION 6

Food surplus will be distributed by organisations following the food waste hierarchy.

Prioritisation of food waste distribution from all parties is aligned well with the food waste hierarchy, both within the social enterprises and supermarkets. It was often the case that the hierarchy was in fact referred to directly by the interviewees - *“We basically have a hierarchy of how we donate our food. It first is offered to our charity partners, then to colleagues and to Olio, and then will be sent to be turned into animal feed and then, lastly, it'll be anaerobically digested”* (Interview 1, Tesco); *“In terms of how we work with them [retailers], it's very much by using the model of the food waste hierarchy. So we're talking about maybe reducing, redistributing and then recycling. So we would sit at the upper end of that place in the food waste hierarchy.”* (Interview 14, Too Good To Go); *So we've got a hierarchy of waste, basically. So the very top is we want it to go to people then below that, I think, is animal feed. Then below that is the anaerobic regeneration and that at the very bottom as in the actual last resort is throwing it in the bin and we don't do that.”* (Interview 5, Fareshare GM). The UK’s Food Waste Roadmap (WRAP, 2023) as part of the Courtauld Commitment includes the food waste hierarchy, and is therefore placed in alignment with the voluntary agreements signed by supermarkets. This means that all stakeholders are working with the same information, and this is reflected in these quotes from the interviews.

Social enterprises talked about *“tapping into what would be food waste and getting it to people who need it”* (Interview 15, Lighthouse Project), *“supporting the communities to see what’s needed”* (Interview 11, Stockport Homes) and *“connecting the food waste and food poverty issues”* (Interview 15, Lighthouse Project) . This indicates their prioritisation of food redistribution to people who need it, which is also the priority in the hierarchy, after reducing waste at source. The social enterprises included in this study were all focused on food waste redistribution, so this prioritisation is understandable. It does also demonstrate their contextual understanding of wider food waste reduction and where they fit into it, in line with the WRAP (2023) Roadmap, supermarkets and the voluntary agreements that they signed, and the food waste hierarchy itself.

For supermarkets, in all three cases they also followed the food waste hierarchy in terms of the order of food waste redistribution. The hierarchy is used in the distribution of food, in that whilst most UK supermarkets send zero waste to landfill, they also allocate resources to getting as much food as possible to people who can eat it, before sending the remainder to facilities such as anaerobic digestion. Most use anaerobic digestion rather than composting for their surplus food (Table 2C).

The supermarket interviewees and secondary sources made reference to the food waste hierarchy directly (*"In tackling food waste, we follow the food material hierarchy" (Source C, Coop, 2022))*, and it was clear that they understood the ordering of the options for food waste redistribution. Tesco have set themselves a clear target for redistribution over other options - *"Tesco is committed to donating half of everything that can be donated for human consumption to humans by 2025"* (Interview 1, Tesco), whereas others have committed to increasing donations but have not put a set target in place - *"Alongside minimising the levels of surplus we create, we are committed to finding innovative ways to redistribute surplus food to customers and communities."* (Morrisons, 2022); *"When we're left with surplus food in* *stores or at our manufacturing sites, we work with partners to redistribute as much of it as possible."* (Morrisons, 2023b); *"Where surplus stock is unavoidable, we ensure that as much as possible is redistributed from store to local food charities, and from depot to national partners, with the remainder being used to make green energy."* (Source C, Co-op, 2022). Each of these quotes reflects the order of the hierarchy and a commitment to increasing the proportion of donations and redistribution over other options lower down the hierarchy.

It was the case in all three of the cases, however, that the proportions of food at each level were perhaps not reflective of the 'upside-down pyramid' nature of the hierarchy, and the majority of food waste and surplus still ended up in anaerobic digestion rather than in feeding hungry people. The proportions at each level, for each of the three cases can be found in the introductions to each case (Tables 5A, 5I and 5Q). This causes an inversion of the hierarchy, where more food is distributed at lower levels of the hierarchy rather than at the top levels. This is somewhat acknowledged due to the investment taking place across all three cases to increase donations and reduce waste overall.

This proposition is somewhat supported, as it is clear that the supermarkets do prioritise their activities in the order of the hierarchy. Still, the quantities at each level would need addressing for them to fully align themselves with the hierarchy.

5.4.3 Research question 3

3. Do **social enterprises** form a key component of UK supermarkets' food surplus networks?

Key themes:

a. Network effectiveness
b. Macro-level network map

Summary: Social enterprises form a key component of UK supermarkets' food surplus networks. However, there is a secondary consideration with this, as it was implied that charities and non-profit organisations were the preferred option for feeding hungry people, as opposed to distribution via a for-profit organisation such as certain social enterprises. This is a challenge for the social enterprise sector, as although many are also non-profit organisations, some are for-profit, or there is some misunderstanding of how social enterprises operate and how profits are reinvested.

5.4.3.1 Network effectiveness

PROPOSITION 7

Social enterprises rely on both strong and weak ties for their success.

In each of the three cases analysed, it was indeed the case that they utilised strong and weak ties within their networks, including social enterprises. Whilst primarily strong ties were seemingly important where food itself was involved, the more information and networking-based ties were often identified as weak. This combination of ties would therefore support the proposition that both are needed for success.

Strong ties made up the majority of the networks where food was physically involved. This includes those between supermarkets, community organisations who take the food to distribute to others, and third-party social enterprises who facilitate food redistribution. These organisations were often rated highly on both emotional intensity and reciprocity factors, and sometimes time and/or mutual confiding in addition to this. Network effectiveness is credited in different ways by different organisations. Tesco suggests that building relationships within the individual stores' communities is important, including the charities and social enterprises they work with - *“It is really about nurturing that relationship between the charity and the individual store which is really down to store managers more than anything”* (Interview 1, Tesco); *“It's about how we support them and how everyone survives.”* (Interview 1, Tesco). One social enterprise operating in the community supports this, highlighting the value of personal relationships over technology-based exchanges, expressing a higher level of confidence in the people involved to help facilitate effectiveness - *“I'm not as confident in the software as I am in the relationship”* (Interview 15, The Lighthouse Project). Morrisons shared that working with Fareshare allows them to reduce waste and simultaneously get surplus food to those who need it - "*We want more and more people to be able to eat well and that means ensuring as little as possible is wasted. Working with FareShare means we get surplus food made into wholesome meals where they are needed."* (Morrisons, cited in Fareshare, 2018). Each of these quotes highlights the importance of social enterprises within the network and how strong ties can support overall success.

For weak ties, there were some positive comments which support the reliance on both strong and weak ties. This comment from Tesco highlights the overall goal and acknowledges that despite weak ties, all supermarkets are working towards the same goal - *"Everyone there is a competitor really but it didn't feel like that at all. We're all just working towards one goal of reducing food waste"* (Interview 1, Tesco). Others identified a limitation in terms of time, which demonstrates an understanding of how organisations can work together across different roles in order to support this wider goal - *"My job is to support the network, I don't have the time to do the work that's needed to look at food waste in Rochdale"* (Interview 9, Action Together). Morrisons spoke about their relationship with local councils, which overall are weak, but suggest that the newsletters they receive and the occasional contact they have is worthwhile - "*Yeah, they [council contacts] are connections that are great to have."* (Interview 2, Morrisons). Similarly, Co-op shares this view of the positives of holding a relationship with the government, including the opportunity to contribute to national policy - *"We're very supportive of the food strategy - I'm sure there was some influence from us there, but only as a very wide piece rather than being specific."* (Interview 3, Co-op). These quotes each demonstrate the value of weak ties within the network in different ways, and holistically support the view that weak ties are indeed utilised for success in the area of food waste reduction.

There were differing approaches between those relationships which were established on a national or regional scale, such as Too Good to Go or The Bread and Butter Thing, and the ones established on a much smaller scale with individual stores. The smaller local social enterprises were not differentiated at all in terms of prioritisation, and they were treated in the same way as charity partners might be. On the other hand, the national agreements were sometimes understood differently, with clear prioritisation taking place. For example, with OLIO and Tesco, it is clear that OLIO, the social enterprise, is a last resort for Tesco, behind not-for-profit organisations such as charities - *"Generally we tend to aim for charity first, and then Olio [which] is a for-profit organisation. We obviously prefer it to go to charities"* (Interview 1, Tesco). This differentiation provides an interesting perspective on how supermarkets may interpret the work of social enterprises compared with charities. It is unclear how this impacts the overall effectiveness of the network, but does demonstrate an inconsistency, where understanding of social enterprise as an entity could be improved.

Multiple participants referred to a tiered approach in addressing food poverty, with the first being food banks and access to food at no cost to the consumer. The second is where social entrepreneurship comes in, as it enables people to access food at a reduced cost rather than free of charge, enabling them to "get themselves back on their feet". This enables the organisation to bring in money to become sustainable in their own right, one of the key defining characteristics of a social enterprise. This tier system is somewhat reflective of the food waste hierarchy but is also a useful way to contextualise the prioritisation of food surplus. This incorporates a mid-tier which is for those who cannot necessarily afford to pay full price for food items but are also in a position where they can contribute financially and do not need access to free food - *“this kind of 2-tier approach to food security is something that people are slowly starting to catch on to”* (Interview 12, TBBT). This mid-tier reflects organisations such as Too Good To Go, where a smaller sum of money is paid for a ‘magic bag’ of food, and in the pantry model, where service users contribute a small amount of money for a bag of food which is worth a higher value than the amount paid.

There is sometimes a split in whether social enterprises collect food from depots or directly from a store. Whilst both have their benefits, it is the case that some supermarkets have decided to keep them separate. Out of the three cases discussed here, Morrisons and Co-op have separated their approaches, whilst Tesco keep them combined - *“We are really proud of our partnership with FareShare. Working with our manufacturing and logistics sites as well as Morrisons branded suppliers, surplus food is redistributed through FareShare's network of charities to those who need it most.” (Morrisons, cited in Fareshare, 2019); “By working with Fareshare we could give our Distribution Centres a simple consistent solution, which was easy to implement and which would deliver high social value in the regions where they operate.” (Co-op, via Fareshare, 2023)*. This split appears to have little bearing on the effectiveness of the network, it is down to the individual supermarket chain or sometimes even the individual store to decide what the most impactful way would be to redistribute the food waste and/or surplus.

Overall, it is indeed the case that for the network to be effective, a combination of strong and weak ties should be used, and social enterprises do indeed form a key part of many supermarket networks in order to redistribute food waste and surplus effectively.

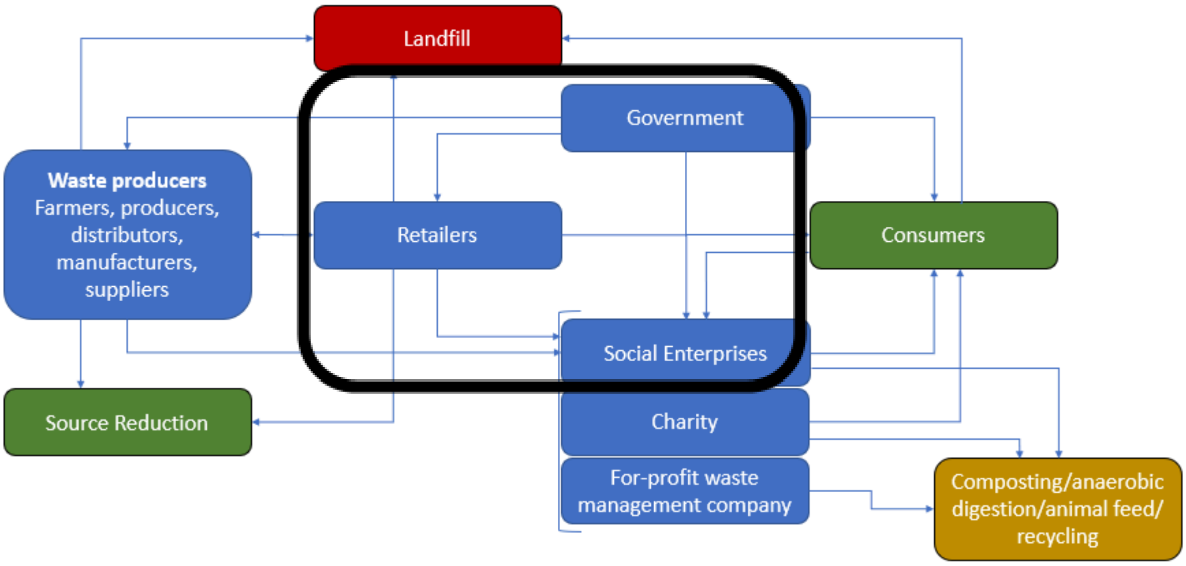
5.4.3.2 Macro-level network map

PROPOSITION 9

The macro-level map of food surplus networks will mirror that in Figure 5 (section 3.4.2).

The macro-level map in section 3.4.2 which shows a broader view of the food surplus network is duplicated below.

Figure 5J: Network diagram showing the section of the map this research will focus on.



This diagram demonstrates different levels of the food supply chain and the potential destinations for food surplus. In many ways, this does reflect the network in each of the three cases, in that they each utilise various options, including source reduction, redistribution to social enterprises and charities and also waste management (Figures 5B, 5E, and 5H). What has been identified is the blurring of the lines between charities and social enterprises in some cases, with some organisations registered as both (for example, Lighthouse Project). This creates some difficulty in identifying a clear split between the two types of organisation, despite the exercise in defining social enterprise in section 2.2.1, which was focused on prioritising social goals over financial ones, and organisational sustainability. This led to the inclusion of some charity-based interviewees as part of the study. It was made clear that when referring to community organisations, this could include charities, social enterprises or those which could be classed as both, and therefore whilst the two are distinctive on the network map above, this differentiation is not as simple practically.

5.4.4 Research question 4

4. Are there any key **facilitating factors** to support the effectiveness of managing food surplus, and do they differ between strong and weak ties?

Key themes:

a. Facilitating factors for network relationships (Summary)
b. Impact of technology on network relationships (Tesco, Co-op)
c. Funding and financial involvement (Co-op)
d. Utilising a combination of strong and weak ties (Tesco, Morrisons, Co-op)
e. Benefits from economic, social and environmental perspectives (Tesco, Morrisons, Co-op)
f. Store-level autonomy and national/regional agreements (Tesco, Morrisons, Co-op)
g. Establishing relationships over time (Morrisons)
h. Working throughout the supply chain (Tesco, Morrisons, Co-op)

Summary: Finance and funding has been identified as a facilitator in enabling the network ties to operate effectively, although more so for the social enterprise and charity organisations than the supermarkets. Another key facilitator in this network is the growth and development of technology platforms which allow for easy relationship management between the network nodes. Many supermarkets do not have the capacity to manage large numbers of relationships themselves but can enable help to get to many different places by utilising the technology which has grown to support this important issue. There are consistencies across many of the other factors too, such as working throughout the supply chain and utilising a combination of strong and weak ties for food waste reduction. Each are discussed here in more detail

5.4.4.1 Facilitating factors

PROPOSITION 10 There will be factors which facilitate effectiveness in the network, and factors which act as barriers.
PROPOSITION 5 More weak ties present in a network lead to more widespread success in the reduction of food surplus.
PROPOSITION 8 Bridging ties will exist within food waste networks to facilitate food surplus management.

These three propositions are all relating to the factors which facilitate network effectiveness in the food waste and surplus supply chain. Through the interviews conducted, and the review of secondary data, a series of factors have been identified within each case which help the network to operate effectively. This supports proposition 10, as there have been some consistencies identified, which will be discussed in more detail throughout this section.

Proposition 5 is not fully supported by this research, as discussed further in section 5.4.4.4. It is, in fact, the case that where food is being passed along through the network, these ties are mostly strong. Where ties were weak, or not operating effectively, the examples given in the interviews (*"We had a similar relationship with Aldi locally, but the time it took to get the stuff really wasn't worth it in terms of what we're getting on a regular basis from them."* Interview 15, Lighthouse Project) showed that these ties were no longer in operation, demonstrating the need for strong ties where products were being exchanged. There were some supporting weak ties in place, which assisted with information exchange and sharing of best practice (Tesco - relationships 6, 7, 8; Morrisons - relationships 6, 7, 8; Co-op - relationships 6, 7). This also includes funding opportunities and establishing new contacts, all of which help to support the operation of the network, but there was no evidence found to support the fact that more of these weak ties led to greater success in the networks.

Bridging ties were indeed identified in the networks, which supports proposition 8. This will be discussed further in section 5.4.4.4. Intermediary nodes and network group nodes acted as two types of bridging ties in the network, connecting two sets of nodes together. This is in support of this part of Granovetter's theory.

The following sections will consider some of the facilitating factors in the network in more detail.

5.4.4.2 Impact of technology on network relationships

Whilst technology has been included as a barrier, it has also been included as a facilitating factor, as it was referred to frequently in the research as an important way of facilitating food exchanges (Interview 1, Tesco; Interview 3, Co-op; Interview 7, GMCA; Interview 11, Stockport Homes). Many of the organisations operating within the network use a mobile phone application (such as Foodiverse or Neighbourly) to enable food suppliers to offer any surplus food out to community organisations, and for the organisations to accept and collect any offers. Co-op have their own version of this, called Caboodle.

Both Tesco and Co-op highlighted the importance of technology for this purpose and discussed the impact it has had on food waste and surplus redistribution (*"Co-op Food Share [precursor to Caboodle] projects an estimated reduction of 20%-30% of store level food waste, and a reduction in backhaul costs."* (WRAP, 2020)). Platforms such as Fareshare Go, FoodCloud, Neighbourly and Foodiverse facilitate the links between supermarkets and organisations, and in addition, platforms such as Olio and Too Good To Go operate between supermarkets and consumers, opening up new ways to share food which had not been possible in the past. Co-op has chosen to go one step further with this and invest in Caboodle - their own sharing platform in partnership with Microsoft. This investment demonstrates the potential for growth in this area and the future opportunities which relate to app-based technology in food sharing.

Tesco also discussed the potential for addressing some of the other barriers in food waste and surplus redistribution via technological investments. They discussed trials of investments such as RFID tags for tracking product expiry dates (*“But it's human error that goes wrong a lot and one thing we're trialling is trying to take out as much human error as possible.”* (Interview 1, Tesco)) and others which were shared via the ECR group, where supermarkets can share best practices on food waste prevention - *“You can have a direct knowledge of where the products are in the store, you can see the code lives on them, so how long they've got left, so you can make sure you reduce them in time, and generally just better tracking of our products, which then helps food waste.”* (Interview 1, Tesco).

The fact that this came up in two different cases demonstrates that it is a facilitating factor in the networks, and it was also discussed with many of the community organisations as they have also found it to be largely helpful in managing their relationships with supermarkets - *“That is a platform where not only does it allow organisations like supermarkets to put on what food they’ve got available for distribution, it also allows community food providers to ask for certain things as well.”* (Interview 7, GMCA); *“Maybe it's just the fact that it's kind of not through Neighbourly, but we just have to speak to store management, and sometimes it's not handed over some of the information, so communication could be a bit better.”* (Interview 11, Stockport Homes). The use of technology became a recurring theme amongst the interviewees, and, therefore can be described as a facilitating factor in food waste and surplus redistribution networks.

5.4.4.3 Funding and financial involvement

Funding and financial involvement was identified as a facilitating factor, not necessarily for the supermarkets, but more so for the social enterprises and community organisations (Interview 4, Fareshare; Interview 6, DEFRA; Interview 9, Action Together; Interview 16, Cracking Good Food).

It was sometimes the case that when discussing a particular relationship, organisations would refer to terms or stipulations set out in a funding agreement, particularly when asked about who the relationship benefits more, with many stating that it was mutual where funding was concerned - *"We had quite a close working relationship with the food insecurity team there [at DEFRA] throughout that spend."* (Interview 4, Fareshare), *"The Scottish government, they are giving us grant funding from surplus for purpose. We've got quite a close relationship with the Scottish government."* (Interview 4, Fareshare). Some also expressed frustration where funding applications had been unsuccessful despite indications to the contrary - *"We were expecting to get a grant yesterday of £1.37 million to fund that and at last minute, it got turned down… all the indications were they loved it and they wanted to fund it"* (Interview 15, Lighthouse Project), and some suggested that the relationship only exists as a result of the funding - *"I wouldn't say it is a close relationship with DEFRA, because they haven't given us the money yet"* (Interview 4, Fareshare).

These relationships were, more often than not, identified as weak ties. However, the funding-based relationships still facilitate operation of an organisation or project, and they indicated gratitude towards the funding body. Funding can therefore be classed as a facilitating factor for parts of the network, as without it many of the organisations would not be viable to operate.

5.4.4.4 Utilising a combination of strong and weak ties

All three of the cases studied utilised a combination of strong and weak ties in their networks in order to maximise their effectiveness. It was clear throughout the interviews that each tie, whether strong or weak, held benefits for the operation of the network in different ways.

The most notable distinction is the clear division between the nature of the relationship and whether they are strong ties or weak ties. It is noticeable that where there is an exchange of food in the network, the ties are primarily strong (Tesco - relationships 1, 2, 3, 4, 5; Morrisons - relationships 1, 2, 3, 4, 5; Co-op - relationships 1, 2, 3, 4, 5), and where the relationship is based on information, funding, sharing of best practice or other non-product-focused outputs, the ties are primarily weak (Tesco - relationships 6, 7, 8; Morrisons - relationships 6, 7, 8; Co-op - relationships 6, 7). It can therefore be said that in food waste networks, whilst strong ties are required for effective food sharing, weak ties are also important to facilitate operation of the rest of the network. Both hold value in the network in different ways, but where weak ties have involved food sharing in the past, this has not worked, has been dissatisfactory for one or both parties and has been subsequently terminated - *“We had a similar relationship with Aldi locally, but the time it took to get the stuff really wasn't worth it in terms of what we're getting on a regular basis from them”* (Interview 15, Lighthouse Project). Thus, developing strong ties where food is shared is more likely to lead to an effective network overall.

Bridging ties were identified across all cases in the network. The bridging ties take on two forms primarily. Firstly, the intermediary nodes which connect supermarkets to the wider network, such as Fareshare, The Bread and Butter Thing, Neighbourly and Foodiverse, operate as bridging ties as they act as a connection between supermarkets and large numbers of community organisations - *“Through contacts, and from FareShare, I found a really good wholesaler. And now I buy a lot of stuff from them.”* (Interview 16, Cracking Good Food). It is the case in some networks that there are also direct ties between supermarkets and certain community organisations, but some supermarkets prefer to operate with one or a small number of direct contacts (such as Fareshare, The Bread and Butter Thing or Too Good To Go) which enables many others to benefit, making it a bridging tie. Secondly, the network groups such as Action Together, Middleton Cooperating, Greater Manchester Food Security Action Network and the Rochdale/Stockport Food Solutions Networks act as bridges between contacts, bringing them together to form their own ties (*“It's a really good network to kind of discuss what's going on in the bigger picture. But again, some partnerships can be made through that”* (Interview 11, Stockport Homes)), or simply operating as an intermediary which relays information, best practice, funding opportunities and relevant updates - *“We do work* *with the Stockport Food Network, and in that we are part of the massive group like WhatsApp group. So if there's anything that is in surplus then we would put it on there and say look, we've got loads of baked beans or whatever, then we'd share it amongst each other which works really well."* (Interview 11, Stockport Homes); *"Some of that is about organisational capacity. From my perspective, I'd like to see more networking and more engagement [from Action Together]"* (Interview 15, Lighthouse Project). These two types of nodes create bridging ties across the network which supports Granovetter's theory on this topic.

In summary, the combination of strong and weak ties is identified as a facilitating factor across all three cases, and is therefore key to the success of the networks.

5.4.4.5 Benefits from economic, social and environmental perspectives

Having an understanding of the benefits of food waste and surplus redistribution from economic, social and environmental perspectives has proven to be helpful in the effective management of the networks. All three supermarkets in the cases, Tesco, Morrisons and Co-op, all acknowledge these benefits both in the interviews and in secondary data, which demonstrates a thorough understanding of why food waste reduction is beneficial.

Tesco in particular acknowledges that this understanding at a high level, including from the CEO, has contributed to their success in this area - *"The UK CEO, his bonus this year and next year will depend on if we hit our food waste targets for 2025"*

(Interview 1, Tesco). They see the benefits across all three areas - economic, social and environmental - *“We're hoping to reduce our waste as much as we can, for both financial and planet aspects, the less waste the better. When you do that though, you do sort of cripple charities’ abilities to get the food to people.”* (Interview 1, Tesco). Morrisons measure the environmental impact of food waste as it forms part of their ‘Planet’ section of the sustainability report - *“It has the potential to save more than 2,500 tons of CO2 per year”* (Interview 2, Morrisons), and also the social and economic - *“The list is endless to be honest of what we do. We give donations out to local schools, and when they have Christmas fayres, especially obviously this time of the year, and throughout the year anybody that was holding maybe a coffee morning for MacMillan we will donate the cakes.”* (Interview 2, Morrisons); *“To stop the waste, they’ve altered what we’re buying in so that you don’t have as much waste for that reason.”* (Interview 2, Morrisons). Co-op also have a holistic approach across all three - *“ To ensure that we minimise our food waste, we have an efficient stock ordering process to make sure that we strive to order the correct amounts to meet demand.”* (Interview 3, Co-op); *“We want to be able to give to a food bank in order to give it to people in need”* (Interview 3, Co-op); *“It encourages us to build on existing environmental work and deliver further reductions in both greenhouse gas emissions and food waste”* (Interview 3, Co-op).

The UK operates with voluntary agreements for food waste reduction (see section 2.1.4), which are linked to the UN’s Sustainable Development Goal for reducing food waste (see section 2.1.3.2), and so the motivations for supermarkets to partake in such agreements can vary. In each of the three cases, both for supermarkets and other interviewees, the different types of benefits were discussed and referred to throughout, demonstrating an understanding that food waste reduction has benefits from a financial perspective, a social perspective and also from an environmental perspective (see section 2.1.1).

This understanding means that regardless of a supermarket's overarching goals, even if primarily economic, food waste reduction will create impact across all of these areas and align with any given objective in the area of food waste and its potential impact. This means that it helps to facilitate the effectiveness of the network as it allows for varying motivations, whatever they might be, to be met through food waste reduction and redistribution.

5.4.4.6 Store-level autonomy and national/regional agreements

Each supermarket studied in each of the three cases for this research operates in a slightly different way with regards to the level of individual store autonomy and the national/regional agreements which are put in place for all stores to follow.

The commonality between all three was that the stores all have at least some level of autonomy to be able to form and develop their own community relationships with local organisations which they believe they would be able to provide the most benefit to - *"It is really about nurturing that relationship between the charity and the individual store which is really down to store managers more than anything"* (Interview 1, Tesco); *"Colleagues are trusted to make their own decisions within the Morrisons* *plan, and are encouraged to improve things for customers and for themselves"* (Morrisons, 2022); *"Co-op as well I think are quite good with local organisations. I think where people are quite embedded in their communities, and there are some small local stores, effectively one of those people knows each other."* (Interview 16, Cracking Good Food).

In stores such as Morrisons, this autonomy is quite significant, where they have a requirement to provide Too Good To Go magic bags, but other than that, the decisions are left to the store, mostly the community champion in store - *"All stores do it [Too Good To Go] from their store. Some stores may have more of one thing than another, some stores might sell one product better than others, so they will never have a certain thing in a Too Good To Go box, whereas we might have it because it doesn't sell as well, and it varies"* (Interview 2, Morrisons). In the region studied, the local cluster of stores work together, via the community champions, to try to establish some best practice and facilitate information sharing to assist each other - *"I'm very much in touch with the Morrisons community champions in our region. It's to share ideas and what we're doing, and how we're doing as a region."* (Interview 2, Morrisons). It is clear that this autonomy, and the use of community champions is seen as core to Morrisons' success in the area of food waste reduction.

Co-op have a similar level of autonomy - *"All the agreements are at store level"* (Interview 3, Co-op). Having many franchisees, it is much more difficult for them to establish national agreements for all stores, they can simply make recommendations to their franchise partners but cannot enforce it - "*It's just a slightly different setup* *with convenience, because some are centrally run and some are franchised out. So those owners have autonomy over whether they join or not."* (Interview 14, Too Good To Go). This has led to an inconsistent approach, but with some commonalities. For example, all Co-op depots work with Fareshare, but this could not be enforced, simply recommended and taken on nationally. Where regional agreements exist, these are sometimes just in one particular region or franchise, for example, Midcounties Co-op and Too Good To Go. Store-based relationships are common across all Co-op stores, where it can be as simple as an organisation asking and signing a form in order to access the store's surplus and waste.

For Tesco, whilst there is some autonomy it may not be as much as others. Tesco stores hold national agreements with Fareshare and Olio, with the opportunity for local organisations to take part mostly via an app. Tesco's community champions often facilitate this, although these roles are part-time and therefore they cannot do it every day. They are responsible for managing the relationships with community organisations where there is a community champion in store - *"Each individual store has charity partners, so charities in the local area will get a chance to see what's being offered by Tesco at the end of the day, and if they want to take any of it, they can come and collect it [...] for free"* (Interview 1, Tesco). The food is first offered to Fareshare and other community organisations, then to colleagues internally, and finally to Olio's Food Waste Heroes *"We basically have a hierarchy of how we donate our food. It first is offered to our charity partners, then to colleagues and to Olio, and then will be sent to be turned into animal feed and then, lastly, it'll be anaerobically digested"* (Interview 1, Tesco). There is keen interest in food waste reduction from

Tesco's senior members of staff, including the CEO, which has likely led to the national-level involvement.

This summary indicates that allowing stores to have some ownership, whilst also implementing some wider initiatives, can help to facilitate the network effectively. It offers stores the opportunity to consider their own local community and how they can support them, whilst also giving them options and direction to work within the regional or national agreements.

5.4.4.7 Establishing relationships over time

As discussed earlier in section 5.4.1.7, it has been clear from the interviews that the length of time a relationship has been in place is often connected with trust and emotional intensity within the tie. To reiterate, many interviewees, when asked about trust in the relationship, would refer to the length of time it had been in place and how long they had been working together, as though this was confirmation of the trust involved *"Being in the role now for as long as I have been, which is almost 10 years, I've built up a lot of connections so I have a lot of people that come to me. Originally I would go looking for people to help out in the community, and things like that."* (Interview 2, Morrisons).

Some interviewees referred directly to this as a benefit, particularly Morrisons, who put a great deal of emphasis on establishing such long-standing relationships within their communities *"I am fortunate in the fact that I don't need to go chasing. I get a lot* *of connections, a lot of people that contact me: can you help me with this, can you do this, and what have you, and I always try to support as much as I can."* (Interview 2, Morrisons). Tesco also supported this from the national perspective, particularly in the case of their relationship with Fareshare *"Zero food waste is a very successful area for Tesco, I think and all these relationships have been forming for like 6 years or longer."* (Interview 1, Tesco).

They agreed that longer-standing relationships are often better developed and therefore operate more effectively, making it a facilitating factor in the network.

5.4.4.8 Working throughout the supply chain

Working not just within stores but also throughout their supply chains also indicates a genuine interest in reducing food waste for supermarkets, whatever the motivation for that may be. This enables relationships within their networks to become stronger, as they can redirect more food surplus and waste through the appropriate channels - *"Our biggest supplier who we have is Tesco. We work all down their supply chain as well."* (Interview 4, FareShare).

Co-op has only this year (2022/23) started to measure their food waste and surplus at their depots, for example, and both Morrisons and Tesco work with their own suppliers to assist them in reducing their food waste - *"In this financial period, we have undertaken a significant exercise to engage 400 of our own-brand suppliers in our new environmental improvement programme."* (Morrisons, 2022); *"We talk to our* *suppliers, and we identify lines that basically waste lots and that end up in the bin. So we work with them to try and get rid of any areas which you can't really sell anyway."* (Interview 1, Tesco). Whilst these figures are not represented in their own waste statistics, it demonstrates a clear intention that they wish to support the organisations they work with both up and down the supply chain.

As a result, this is also a facilitating factor in the network, as it aims to reduce food waste not just for the benefits of the statistics but in support of their network ties.

5.4.5 Research question 5

5. Are there any **barriers** to the effectiveness of managing food surplus, and do they differ between strong and weak ties?

Key themes:

a. Barriers within network relationships (Summary)
b. Quality and quantity of food available (Tesco, Morrisons, Co-op)
c. Personnel changes (Morrisons)
d. Short turnaround times, use-by, sell-by and best-before dates (Morrisons, Co-op)

e. Competing targets and key performance indicators (KPIs) (Tesco, Morrisons, Co-op)
f. Confidence in technology (Tesco, Co-op)
g. Legislation (Tesco, Morrisons, Co-op)
h. Societal challenges (including cost-of-living crisis and COVID-19 pandemic) (Tesco)

Summary: One of the key barriers identified in this research was around the significance of personal relationships within the network. Whilst this research is looking at organisational links, it is of interest to note that many of the organisational relationships may not exist, or be as effective, if particular individuals were not involved.

Some interviewees also expressed doubts about the priorities of supermarkets and their approach to managing food surplus. This was also relevant to perceptions on the quality and quantity of food available for redistribution, where occasionally there was a mismatch in what was being picked up to what was advertised. In some cases, this issue led to a breakdown of the relationship completely, as it was not considered worthwhile to continue to pursue.

5.4.5.1 Barriers within network relationships

PROPOSITION 10

There will be factors which facilitate effectiveness in the network, and factors which act as barriers.

This proposition is relating to the factors which act as barriers to network effectiveness in the food waste and surplus supply chain. Through the interviews conducted, and the review of secondary data, a series of factors have been identified within each case which restrict the network from operating as effectively as it could, and some of the challenges involved. This supports proposition 10, as there have been some consistencies identified, which will be discussed in more detail throughout this section.

5.4.5.2 Quality and quantity of food available

Where some supermarkets are wanting to engage with local organisations, the volume of food they can offer can sometimes be a barrier, as it may not be worth the time for the organisation to come and collect smaller quantities - *“We had a relationship with Aldi locally, but the time it took to get the stuff really wasn't worth it in terms of what we're getting on a regular basis from them”* (Interview 15, Lighthouse Project). This barrier is important to consider, as despite a much higher demand than supply, the organisation must still be able to rely somewhat on the quality of food which can be collected, and the value of spending their time coming to collect it.

In some cases, where both quality and quantity of food were lacking, this has led to the tie breaking down and no longer operating, as they assessed that it was not worth their time - *"We drifted apart, because of the quantity and quality of what we were getting from them. Sometimes it was minimal, sometimes it was nothing, sometimes it was poor quality."* (Interview 15, Lighthouse Project).. Whilst the quantity does not need to be consistent to exact numbers, because it simply can't be predicted in that way, organisations need some level of confidence that what will be available will be worth their time to collect.

This creates a barrier for some supermarkets where they are either unsure of what level of food quality is required, or cannot reliably offer a certain quantity of food. This is potentially a good thing in itself as it indicates low levels of waste, but where they do wish to engage with alternatives, there can be barriers which are placed in the way of the individual store by community organisations themselves.

5.4.5.3 Personnel changes

Individuals in certain roles can be significant in determining how successful the tie is, how willing they are to partake in the network, and to what extent. A change in personnel in a particular role can affect an organisational relationship drastically, which demonstrates the importance of the developed relationships between individuals alongside the organisational ones.

This indicates that policies and processes in this area may not be as robust as they could be, and perhaps this is an area in which supermarkets need to be clearer - *"It's all about people, none of them, no matter what they tell you, none of them have robust enforceable processes or policies that make food redistribution a priority, it's* *only when you actually get people that care in the right roles that things happen."* (Interview 12, TBBT); "I'm not as confident in the software as I am in the relationship" (Interview 15, Lighthouse Project). Where in-store community champions change, for example, the organisations perhaps need some reassurance that they would not be disadvantaged by this - *"I've built up a lot of connections so I have a lot of people that come to me"* (Interview 2, Morrisons).

Similarly, changes in local councillors and elected positions at both local and national levels can change policy in these areas - *"Changes in personnel from electoral positions changes policy. So once a new councillor comes in, it can radically change how they engage with us"* (Interview 12, TBBT), which can also affect relationships, how they operate and the requirements on supermarkets to engage - *"Food redistribution has been 3 or 4 on the agenda in priority terms for the 20 years I've been working in this space and it never gets above that"* (Interview 12, TBBT). A high level of interest from the elected individual in food waste and redistribution can be both a positive and negative, as they may try to make changes which don't work for the network - *"If they are interested in this space, they seem to be very interested in making it work the way they think it should work rather than actually taking a moment to learn."* (Interview 12, TBBT), but without their interest it may no longer be a priority for resource and funding allocation.

For these reasons, this has been determined as a potential barrier for the network and its effectiveness.

5.4.5.4 Short turnaround times, use-by, sell-by and best-before dates

Relating to the legislation barrier in 5.4.5.7, the challenge of short turnaround times was mentioned in multiple interviews, both with supermarkets (Interview 2, Morrisons; Interview 3, Co-op) and the community organisations.

Where supermarkets wish to maximise their in-store sales prior to redistributing waste and surplus, this leaves a very short turnaround time for organisations to retrieve the food and distribute it amongst their own service users prior to any use-by dates, which leads to a greater proportion of waste - *"Even if I'm offering it to a food pantry or food bank, if they can't turn it around within a short time, then it's no good to them either - back in the day, it would just get unfortunately wasted."* (Interview 2, Morrisons); *"We found out that if you offer reductions earlier to customers, they will more likely get rid of food waste, and therefore save the environment."* (Interview 1, Tesco).

Best-before and sell-by dates have a little more flexibility, and any surplus, which is clearly going to be surplus prior to the use-by dates, can be distributed in a more timely manner - *"In January 2022 we scrapped "use by" dates on 90 percent of our own-brand milk, changing our labelling to "best before". As a marker of quality, not food safety, it's designed to encourage customers to decide for themselves whether their milk is still good to drink."* (Morrisons, 2023b). However, the main barrier is in those very short turnaround times where anything not collected ends up as waste, and anything which is collected could still end up as waste as a result of the timing difficulties around the redistribution from intermediary ties such as Fareshare to other community organisations and service users - *"We have several charity partners, such as FareShare. The reason for this set up is because a lot of the food needs to be redistributed that exact day, or within those few hours in which the timeframe for charities is too small, and they can't safely redistribute that food."* (Interview 14, Too Good To Go); *"So things like fresh fruit and stuff like that, we want to be able to give to a food bank in order to give it to people in need right there and then, however, as soon as it goes past that 10pm mark, then it would have to go into the bin to go down the anaerobic digestion route later on."* (Interview 3, Co-op).

5.4.5.5 Competing targets and key performance indicators (KPIs)

It is often the case, as demonstrated across all three cases, that supermarkets set targets for food surplus redistribution and food waste reduction, which can be conflicting or at least competing - *"At some point we're hoping to reduce our waste as much as we can, for both financial and planet aspects, the less waste the better. So Tesco's is in a really weird place where we're trying to do as much as we can one way, but also do as much the other way."* (Interview 1, Tesco). The supermarkets observed that targets are generally to increase food redistribution and to reduce waste overall at the source, but less waste means less available for redistribution - for example in these two competing targets for Co-op - *"We will reduce food waste generated by our stores and depots by 50% by 2030, compared to 2022."* (Source C, Co-op, 2022); *"Building on this [increase in food donations] will be a priority in 2023 as we ensure we focus on preventing food being wasted in the first place and* *maximising the amount of surplus food we can share."* (Source C, Co-op, 2022). If their supply chains were fully optimised to very low levels of waste, their redistribution would naturally fall, and so in order to meet both targets, they would need to ensure a surplus which is in contradiction of the target to reduce waste overall - *"Most of that stuff [forecasting] is automated but it's how much we put our settings on to make sure we order enough that customers can get it, but also order not too much that we waste, but we waste enough that charity partners can get it. You've got like 3 competing KPIs there and there's no perfect way."* (Interview 1, Tesco).

It could perhaps be the case that percentages could be used in place of volume increases and decreases, aiming to move a percentage of the waste which currently goes to anaerobic digestion or green energy to redistribution. This would reduce the competition between the various targets and therefore the barrier which exists in increasing food redistribution.

5.4.5.6 Confidence in technology

Technology has proven to be a key facilitating factor in distributing food surplus, yet it has also been included as a barrier, as it doesn't always work as effectively as expected. This has led to some organisations indicating that they are not necessarily confident in the use of the technology (Tesco - relationship 5; Co-op - relationship 5) - *"I'm not as confident in the software as I am in the relationship"* (Interview 13, Lighthouse Project); *"Maybe it's just the fact that it's kind of not through Neighbourly, but we just have to speak to store management, and sometimes it's not handed over* *some of the information."* (Interview 11, Stockport Homes). This can be due to communications not being received in a timely manner, inaccuracies in reported quantity of food available or software downtime, for example, which can lead to various issues with reporting, collections and relationship building - *"For example, one time if we turn up, the food that we are meant to have is not there. Someone else has taken it."* (Interview 11, Stockport Homes).

For example, one community organisation (Interview 15, Lighthouse Project) points out that any small data inaccuracies could be inflating supermarket redistribution statistics incorrectly if the collection is recorded as a certain number of kilograms over what the charity is actually receiving - *"It might be that's overestimating in their records, the amount of food waste that they're diverting to charity, they're saying that we're getting more than we are actually getting"* (Interview 15, Lighthouse Project). The independent auditors who assess the statistics, however, would likely have detected this if it were an ongoing issue. This could be anything from faulty scales to multiple charities accessing the food, and so perhaps they are dividing the full amount between a few charities meaning that the overall quantities are still correct but the individual charity does not get as much as they are promised. Either way, it would appear that this is being looked into, and overall the organisation says they trust the supermarket as a partner and they blame this issue primarily on the technology.

Technology remains a barrier as well as a facilitator due to issues such as these, with the aspiration that as the technology improves and becomes more reliable, it is no longer a barrier.

5.4.5.7 Legislation

Legislation has an impact on food redistribution in a number of ways, largely focused around health and safety, and around preventing any supermarket from gaining a monopoly on the market. Whilst both of these things are necessary, working within them can still be a barrier to maximising food redistribution.

Health and safety laws around food exist for good reason, to keep people healthy and safe with regards to the food they consume. These laws regulate things like sales or distribution of food past its use-by date, and storage of certain food types, both of which can have an impact on redistribution, especially when supermarkets are looking to first sell the food and only redistribute later on in the day - *"It's just sell first and food banks second"* (Interview 3, Co-op). This can mean that more food ends up going to waste as it becomes too close to the end of the use-by date and organisations cannot make use of it, or it cannot be properly stored by the receiving organisation - *"They're really helpful but then they send us a text at 9 pm asking for someone to come within the hour to collect all this chicken. If it comes up last minute it's then not accessible. It's difficult for the user to access"* (Interview 16, Cracking Good Food). Even if consumers are happy to accept food past this date, it cannot be given, and so it has been included as a barrier to fully effective food redistribution networks despite the necessity of such rules - *"The problem we had with that is sometimes things have a date on, and you can see they are absolutely fine, and would be for a few more days anyway."* (Interview 2, Morrisons).

The GSCOP (Groceries Supply Code of Practice) rules (GOV.UK, 2009) are in place to avoid price gouging and market monopolies, including setting rules for establishing fair relationships with suppliers - *"So when we work with other suppliers or supermarkets and suppliers, to be fair, we're very careful not to infringe on GSCOP." (Interview 1, Tesco).* The Economic Recovery Group (ECR Group) which was set up to discuss food waste challenges across the supermarket sector and to be able to share best practice, is the closest that the supermarkets come to establishing relationships on this subject as a result of these kinds of rules, although there may be some potential to collaborate further in their absence - *"it's an intra-government and intra-retail forum where you share best practices for reducing food waste."* (Interview 1, Tesco). For that reason, this is included as a barrier despite the necessity of having such rules in place.

5.4.5.8 Societal challenges

Societal challenges have proven to be a consistent barrier across all three cases, with a number of external factors impacting the operation of the network. Two such challenges include the COVID-19 pandemic, which had a widespread impact on the food supply chain and food poverty (Jones et al, 2022; Brown et al, 2022), especially on food banks with the sudden and rapid growth in demand for their support

(Capodistrias et al, 2022); and the somewhat associated cost-of-living crisis in the UK which followed (Khan, 2022) - *"Brexit, COVID, Ukraine, cost of living crisis – every single one of them stops food redistribution moving up the agenda"* (Interview 12, TBBT).

Both of these challenges have directly impacted food waste and surplus networks in different ways, with more people relying on the support of food banks and other similar offers of more affordable food options such as food pantries and sharing platforms such as Too Good To Go and Olio, where food can be obtained at a lower cost than in supermarkets - *"We're busy opening new hubs in new regions because this kind of 2-tier approach to food security is something that people are slowly starting to catch on to"* (Interview 12, TBBT); *"The voluntary sector is a kind caring sector and they just want to help their communities, and prior to COVID, we only really had four food banks in Rochdale. We now have 50+ groups as part of the Food Solutions Network."* (Interview 9, Action Together). This has increased the demand for the services involved in distributing food surplus and what would otherwise be waste, including a greater demand for 'yellow sticker' items which are reduced in stores on the use-by date. It is often this food which is offered to charities and social enterprises if it has not sold in store, but the increased demand is leaving less left over to be distributed to such organisations, at a time when they actually need more - *"Our reduced to clear stuff, the yellow sticker stuff sells like hot cakes right now. Everyone grabs it as much as they can because they want a bargain. But that means there's a lot less available for charities."* (Interview 1, Tesco).

This is noted as a barrier as there is more demand than there is supply in the network (*"It's really frustrating because we're serving 4,000 families every week but turning away 1,500 so you just know that there's more demand and more need"* (Interview 12, TBBT)), and coupled with the other barriers discussed above, it creates further challenges for supermarkets and for the network as a whole to redistribute surplus food.

5.4.6 Research question 6

6. What are the key **motivations** of food waste reduction stakeholders to partake in the network?

Key themes:

a. Motivations for establishing relationships
b. Government involvement

Summary: Motivations seemed to vary between organisations, some with economic/financial significance and many with social and environmental motivations for food waste reduction. In cases where the two were combined, the relationship appeared to be very strong, although a genuine social/environmental motivation appeared to yield stronger relationship ties.

5.4.6.1 Motivations for establishing relationships

PROPOSITION 11

Motivations will be primarily economic for supermarkets, and primarily social for social enterprises and governments.

The discussion on motivations for establishing relationships can be separated into the motivations of supermarkets, of social enterprises and of governments.

The motivations of supermarkets to engage with social enterprises appears multi-faceted, with discussions around environmental and social benefits alongside achieving set targets and public perception.

Such targets, including ones to reduce food waste by 50% in line with the UN goal by 2030, can actually help social enterprises in their work, with one stating that *“they've obviously got targets within the supermarket and within the company about maximising the amount of food waste they divert to charity, so that works well for them”* (Interview 15, Lighthouse Project), in reference to having an established relationship with a social enterprise.

Some organisations question the true motivations of some of their supermarket partners, suggesting that the economic and financial benefits, as well as marketing and PR benefits are their main focus rather than the social and environmental factors - *“Don't believe the hype. No matter what they say they're doing, they are definitely still just doing the low hanging fruit”* (Interview 12, TBBT); *“It might be that's* *overestimating in their records, the amount of food waste that they're diverting to charity, they're saying that we're getting more than we are actually getting."* (Interview 15, Lighthouse Project). The supermarkets do not attempt to hide the fact that they would prefer to sell the food for profit, prioritising such options over donations - *"It's just sell first and food banks second"* (Interview 3, Co-op), but on the other hand, it is also the case that they clearly feel some responsibility too, with Tesco purposely setting their stock management to enable some donations - *"Most of that stuff [forecasting] is automated but it's how much we put our settings on to make sure we order enough that customers can get it, but also order not too much that we waste, but we waste enough that charity partners can get it. You've got like 3 competing KPIs there and there's no perfect way."* (Interview 1, Tesco), and Morrisons employing full-time community champions to work to better engage with and understand the community's needs.

On the other side, for social enterprises, some are happy to acknowledge where there is an economic benefit, but will primarily focus on the social goals, aiming to get as much food to those who need it as possible - *"In a social enterprise, with the work we do, the more profit we can make goes back into the community projects. That's why it works."* (Interview 16, Cracking Good Food); *"It's really frustrating because we're serving 4,000 families every week but turning away 1,500 so you just know that there's more demand and more need and we're doing what we can to kind of mitigate that"* (Interview 12, TBBT). Their missions have a clear social purpose which they work towards relentlessly. This is similarly the case for the community organisations and governments, although they have less of an economic case and tend to be entirely focused on social motivations.

This is in support of proposition 11, where the primary motivations are divided. It is clear, however, that particularly for supermarkets, their engagement with social and environmental factors is also fairly significant and so should not be ignored. As discussed in section 5.4.4.5, their acknowledgement of the other motivations for food waste reduction is a key facilitating factor in the network and whilst economic motivations may be their primary purpose whilst operating as a business, they also consider the other benefits, even including them as KPIs and targets.

5.4.6.2 Government involvement

Governments and local councils are also motivated by food waste reduction for all of the reasons already stated, including economic, social and environmental factors. As a primarily public body, which aims to support its community, social factors should be highlighted as their main motivation.

Local councils and NGOs have a vested interest in ensuring the wellbeing of their communities, and thus will try to provide support, funding and resources as appropriate - *"It's the RBH organisation that hosts the role but it's to make things like the pantries more economically sustainable so where we can, we source more free surplus food or lower cost surplus food or donations, and bring that into the Rochdale borough food system."* (Interview 10, Rochdale Housing Association); *"We support* *the voluntary sector, we invest in the sector through the Response, Repair, Recover Fund, we do partnership and collaboration with the sector and bring all that together."* (Interview 9, Action Together).

This indicates that government motivations are indeed focused on social benefits, again in support of proposition 11.

However, it is noted that the supermarkets themselves do not tend to have a strong direct relationship with local councils, with each of these identified as weak ties (Tesco - relationship 7; Morrisons - relationship 7; Co-op - relationship 7). They would tend to instead form their relationships at national level with the government, although still weak (Tesco - relationship 6; Morrisons - relationship 6; Co-op - relationship 6) - *"It's just more around intelligence sharing and relationship building in the broader sense"* (Interview 6, DEFRA), and the supermarkets do appear to engage locally when needed - *"I work with different councillors on food strategy meetings that I sometimes attend if I can."* (Interview 2, Morrisons).

5.4.7 Summary of propositions

The table below shows which of the propositions were supported in each of the cases, demonstrating the breadth of support for each one. This will help to inform the discussion in the following chapter.

Table 5Z: Summary of propositions supported by case studies.

		RQ	1	2	3
PROPOSITION 1	The more time spent together (both frequency and duration), the stronger the tie.	1	No	No	No
PROPOSITION 2	The higher the emotional intensity score, the stronger the tie.	1	Yes	Yes	Yes
PROPOSITION 3	The higher the score for mutual confiding, the stronger the tie.	1	No	No	No
PROPOSITION 4	The higher the score on the reciprocity scale, the stronger the tie.	1	Yes	Yes	Yes
PROPOSITION 5	More weak ties present in a network lead to more widespread success in the reduction of food surplus.	4	No	No	No
PROPOSITION 6	Food surplus will be distributed by organisations following the food waste hierarchy.	2	Yes	Yes	Yes
PROPOSITION 7	Social enterprises rely on both strong and weak ties for their success.	3	Yes	Yes	Yes
PROPOSITION 8	Bridging ties will exist within food waste networks to facilitate food surplus management.	4	Yes	Yes	Yes
PROPOSITION 9	The macro-level map of food surplus networks will mirror that in Figure 5.	3	Yes	Yes	Yes
PROPOSITION 10	There will be factors which facilitate effectiveness in the network and factors which act as barriers.	4,5	Yes	Yes	Yes
PROPOSITION 11	Motivations will be primarily economic for supermarkets, and primarily social for social enterprises and governments.	6	Yes	Yes	Yes

6.0 DISCUSSION AND CONCLUSIONS

This section will outline the contributions made by this study to the body of research knowledge, to policy, and to Granovetter's theory which was used as the grounding for this thesis. The key conclusions, aligned to each research question, are as follows and are discussed in more detail throughout the chapter. Each begins with a summary of conclusions by research question, followed by more detail on each point.

6.1 Research question 1

Are UK supermarkets' food surplus networks comprised of **both strong and weak ties** with social enterprises, governments and other supporting organisations?

A. Granovetter's strength of weak ties theory is not necessarily true of networks where physical items are exchanged but is often true of knowledge and information exchange.
B. Strong ties do not always need to rank highly across all four of Granovetter's factors, but should rank highly on emotional intensity and reciprocity as a minimum.

6.1.1 Contribution to theory - knowledge and information exchange (1A)

This research indicates that Granovetter's theory is true for the exchange of knowledge and information - as the nodes which utilised various weak ties in this way appeared to be effective - but where physical items were part of the exchange, the theory falters. Relationships outside of the food surplus supply chain, for example, between supermarkets and with organisations such as local councils and non-governmental organisations (NGOs) demonstrated a range of weaker ties which helped to inform the process without being directly involved in it (Tesco - relationships 6, 7, 8; Morrisons - relationships 6, 7, 8; Co-op - relationships 6, 7). Granovetter's (1973) theory focuses on information and flow of information rather than exchange of physical items (see chapter 2.3.3.2.6 - *"Information and ideas thus flow more easily. Maintenance of weak ties may well be the most important consequence."* (Granovetter, 1973)), which is accurately reflected in this research, however when aligned to physical resource exchange, the theory is not reflected in this network. This is demonstrated by the network maps produced for each case (Figures 5C, 5F, and 5I), which each show strong ties where there is physical exchange of food, and weak ties where there is not.

Supermarkets share best practices and ideas on food waste reduction through a networking group that meets sporadically, supporting Granovetter's theory by facilitating the establishment of these weak ties. The group consists of competing organisations that are restricted by competition laws in what they can collaborate on, as discussed in the analysis (see chapter 5.4.5.7). This means that whilst the ties may be of benefit, and the meetings can be useful, the ties remain weak. Similar arrangements exist for the Greater Manchester Food Security Action Network, Rochdale Food Solutions Network and Middleton Cooperating, which exist to support the development of networks across a specific area or region.

6.1.2 Contribution to knowledge - factors in strong ties (1B)

A finding of interest is that whilst reciprocity and emotional intensity were key factors in identifying strong ties, mutual confiding and time were less important. Granovetter's (1973) theory states that "the strength of a tie is a (probably linear) combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterise the tie" (Granovetter, 1973, p. 1361). This was not shown to be the case in this research, as where time and mutual confiding were assessed as low, the contextual qualitative interpretation still demonstrated a strong tie.

Mutual confiding was not deemed particularly necessary for the tie to be strong, with interviewees often stating that even if they would share confidential information, there is little reason or opportunity to (Tesco - relationships 2, 3, 5, 6, 7, 8; Morrisons - relationships 2, 4, 5, 6, 8; Co-op - relationship 1, 4, 5). This signifies that the participants themselves do not attach importance to this factor, as it did not impact their own assessments of the ties, when asked to rate them on a scale - *"Generally, we just don't need to exchange [confidential] information with them"* (Interview 5, Fareshare GM).

When discussing time as a factor in the tie strength, it was said that whilst the relationships required time to set up initially (*"I don't think it actually involves too much company time in terms of support services, because once an agreement is in* *place. it's very much just the case that they know when and where to pick it up" -* (Interview 3, Co-op)), they would actually prefer that a shorter length of time is spent on it on a daily or weekly basis, as it is an indicator that operationally it is running smoothly if less time is required - *"There's only phone calls when there are issues"* (Interview 15, Lighthouse Project). Time was a factor, however, in terms of the length of the overall relationship. Often, participants were more willing to indicate a higher tie strength score if the relationship had been in place for longer - *"The [Morrisons] sustainability team have known me [TBBT] for a very long time and they trust us"* (Interview 12, TBBT). Where a relationship was new, they were less willing to give a high overall score on tie strength - *"I'd go lower [on the rating] because it's early days"* (Interview 10, Rochdale Housing Association).

Seeking advice was used as an indicator of emotional intensity and was often ranked highly in those ties ranked as strong, along with reciprocity (Tesco - relationships 1, 2, 3, 4, 5; Morrisons - relationships 1, 2, 3, 4, 5; Co-op - relationships 1, 2, 3, 4, 5). Many interviewees believed there was a benefit to both parties, particularly where a physical product (food surplus) was involved (Tesco - relationships 1, 2, 5; Morrisons - relationships 1, 2, 3, 4, 5, 7; Co-op - relationships 1, 2, 3, 4, 5) - *"Definitely mutual again with the sustainability goals for them. We bring people into their shops, who then pick up other items and buy other things"* (Interview 14, Too Good To Go).

6.2 Research question 2

How do the strong and weak ties within the network effectively enable social enterprises to assist in managing supermarket food surplus, and how does this align with the **food waste hierarchy**?

A. Supermarkets work within the food waste hierarchy to prioritise food surplus distribution but differentiate further between providing edible food to nonprofit and for-profit organisations, with the former being the preferred option.

B. Policy should reflect the order of the food waste hierarchy and challenge supermarkets to increase proportions at the source reduction and feeding hungry people levels, by reducing that which currently goes to anaerobic digestion.

C. Identification of the two-tier system which forms an additional consideration for the food waste hierarchy.

6.2.1 Contribution to knowledge - supermarkets and the food waste hierarchy (2A)

UK supermarkets have acknowledged that in relation to the food waste hierarchy, there is more they could do to reduce surplus food at the source should they wish to, however, Tesco especially, sees it as a responsibility to be able to provide food to local people in need (Tesco, Interview 1). As a result, they continue to order slightly more than is required purposely, to be able to support them - *“So Tesco's is in a really* *weird place where we're trying to do as much as we can one way, but also do them as much the other way. And no one's really come with a solution."* (Interview 1, Tesco). The research suggests that they can continue to do this as a result of their strong network ties as demonstrated throughout the case, who will collect and utilise their surplus to ensure that they can maintain their food waste reduction goals despite this over-ordering. If the demand was no longer there, they could reduce this over-ordering further to prevent higher levels of waste.

Supermarkets also align with the food waste hierarchy - prioritising food redistribution for hungry people, followed by animal feed and then anaerobic digestion and composting. Most supermarkets do not use composting at all, and all have a zero-waste-to-landfill policy (see Table 2C). Therefore, their own hierarchy stops at the anaerobic digestion phase (Tesco - Table 5A, Morrisons - Table 5I, Co-op - Table 5Q). However, they differentiate somewhat between giving to charities, where the food will be distributed for free to consumers, and social enterprises, where the consumers will pay a nominal amount for the food. This differentiation in the hierarchy differs between supermarkets but is distinct nonetheless - *"Generally we tend to aim for charity first, and then Olio [which] is a for-profit organisation. We obviously prefer it to go to charities"* (Interview 1, Tesco). It is often the case that supermarkets would prioritise non-profit organisations for their food redistribution, over other for-profit ones. Where an intermediary such as Fareshare is involved, however, there is less control over this from the supermarkets, as users of Fareshare's service can be from a charity, a not-for-profit organisation, a community group or a social enterprise (Fareshare, 2017).

Supermarkets acknowledge that whilst they want to continue supporting charities and local organisations for philanthropic and social responsibility reasons, it also benefits their public image and has been used as a marketing tool to promote the good they do through food donations. Some social enterprises considered this as a motivation for supermarkets within their interviews, and supermarkets acknowledged it - *“What customers think of the business is really the main driver of all of this. If a customer sees that Tesco’s is really into FareShare and donates 2 million meals, they are way more likely to come back.“* (Interview 1, Tesco). However, they maintain that this is merely a secondary benefit. This is an additional motivator to avoid complete optimisation of the supply chain, as it allows for messaging around ‘meals donated’. These messages are verified and audited by external organisations to ensure accuracy - *“Tesco love to quote – so if we say we donated 2 million meals this year, we have to make sure that's actually backed up. So we have external auditors to come in and do that.”* (Interview 1, Tesco). However, one beneficiary organisation that receives food stated that occasionally, the available food reported is considerably higher than what is actually received. It is unclear how the auditors verify the figures, but there is a small chance that if reported figures are used, they might not be completely accurate - *“What they're saying is a lot more than we're getting and we've not managed to work out with them why that is yet.”* (Interview 15, Lighthouse Project). In this example, an intermediary platform was used to facilitate the transaction, so it is unclear with whom the responsibility would lie for any error.

6.2.2 Contribution to policy - challenge supermarkets to better reflect the proportions of waste at the levels of the hierarchy (2B)

When the Food Waste Roadmap was developed, it seems that redistribution was not originally included in the plan, differing from the food waste hierarchy in that way. *“The food waste roadmap actually eradicated redistribution from it, so it was all about reduction and then from that, they stepped down to animal feed and then to anaerobic digestion. And we had to lobby quite hard to get redistribution back on the map”* (Interview 12, TBBT). It seems that the lobbying efforts from related organisations helped to ensure it was included in the final version. The fact it was not there from the outset implies that it was not being prioritised by policymakers, which could have affected redistribution organisations significantly had the supermarkets’ investments gone towards increasing use of animal feed instead.

As it stands, across all three cases, the proportions of food waste at each stage of the food waste hierarchy demonstrated an inverse of the pyramid, with more food waste sent to anaerobic digestion than to feeding hungry people (Tesco - Table 5A, Morrisons - Table 5I, Co-op - Table 5Q). Policy should therefore go further to better reflect the order of the food waste hierarchy, by challenging supermarkets to increase proportions at the source reduction and feeding hungry people levels of their strategies, and reducing that which currently goes to anaerobic digestion, thus moving the waste further up the hierarchy and better aligning with the inverted pyramid which makes up the hierarchy.

This would lead to a greater proportion of food available for the community organisations and social enterprises, who currently operate with more demand than supply - *“Everywhere is oversubscribed. We are turning away the best part of 1,500 people every week.*” (Interview 12, TBBT). Increased donations would therefore also help to address this as a social issue.

6.2.3 Contribution to practice - Identification of the two-tier system which forms an additional consideration for the food waste hierarchy.

Discussions of the two-tier approach to food waste distribution have identified a potential development for the food waste hierarchy. It highlights that there is a difference between ‘feeding hungry people’, the current level of the hierarchy, and simply feeding individuals, regardless of their level of need. Too Good To Go and The Bread and Butter Thing, along with the food pantries, represent this type of organisation which differentiates between giving out food for free and charging a nominal amount of money for it, although not as much as full-price - *“This kind of 2-tier approach to food security is something that people are slowly starting to catch on to”* (Interview 12, TBBT). It allows people who can afford to contribute to feel more in control and take back some ownership - *“We see the pantry as a move on for people who might come in in crisis with a referral for the food bank, and after a few weeks get themselves a bit better sorted out, and then they can become members of the pantry and pay regularly and get that kind of longer term support as they get themselves back on their feet”* (Interview 15, Lighthouse Project). Socially, this can be beneficial as it acts as a stepping stone between the food bank and full-price shopping, and promoting and developing this area further could be highly beneficial to society. In the case of the Lighthouse Project it can also act as a wider support network, even leading to work experience opportunities - *"Most of those volunteers now are people who join the pantry as customers. One of the volunteers has also now got a paid role within the Lighthouse Project, managing and overseeing the operation of the pantry and the food bank together."* (Interview 15, Lighthouse Project). This further demonstrates the social impact which can come of this approach.

6.3 Research question 3

Do **social enterprises** form a key component of UK supermarkets' food surplus networks?

A. The macro-level network map (Figure 6A) is supported by all three cases.
B. The line between social enterprises and charities in the area of UK food waste is blurred, with many overlaps.

6.3.1 Contribution to knowledge - macro-level network map (3A)

Proposition 9 and research question 3 allowed for testing of the structure of the network map and an attempt to deduce its accuracy through the interviews and secondary research conducted. When compared to the network maps produced for each individual case in this research (Figures 5B, 5E, and 5H), similarities can be drawn from them, and therefore this research supports this as a macro-level map of food waste management.

6B shows an example of a single retailer (Tesco) at the centre of the network, the nodes used in food waste management and how they align with the stages of the hierarchy shown also in 6A. Again, this map demonstrates many similarities with 6A, and can therefore support it as a reflection of the network. Morrisons and Co-op found similar structures which also support this.

Figure 6A: Network diagram showing the section of the map this research focuses on.

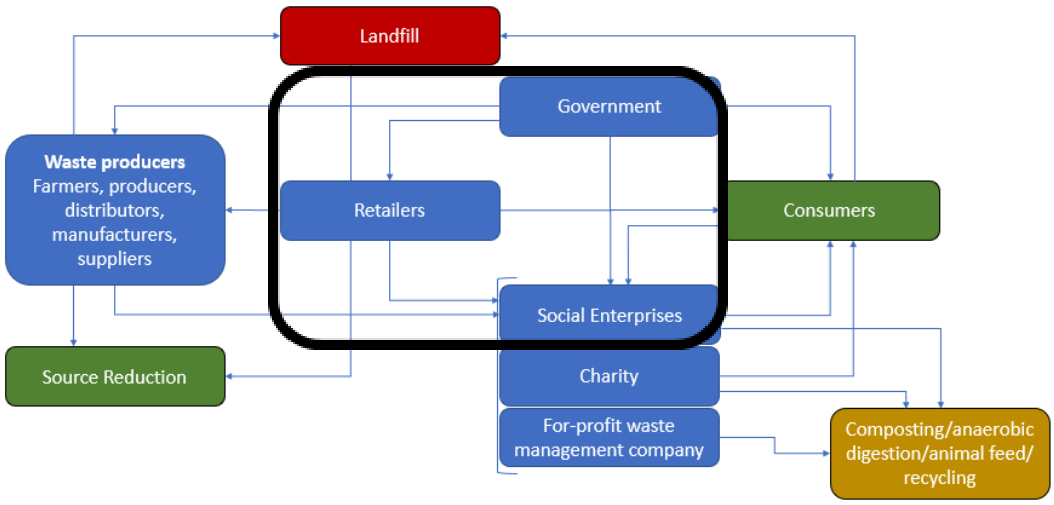
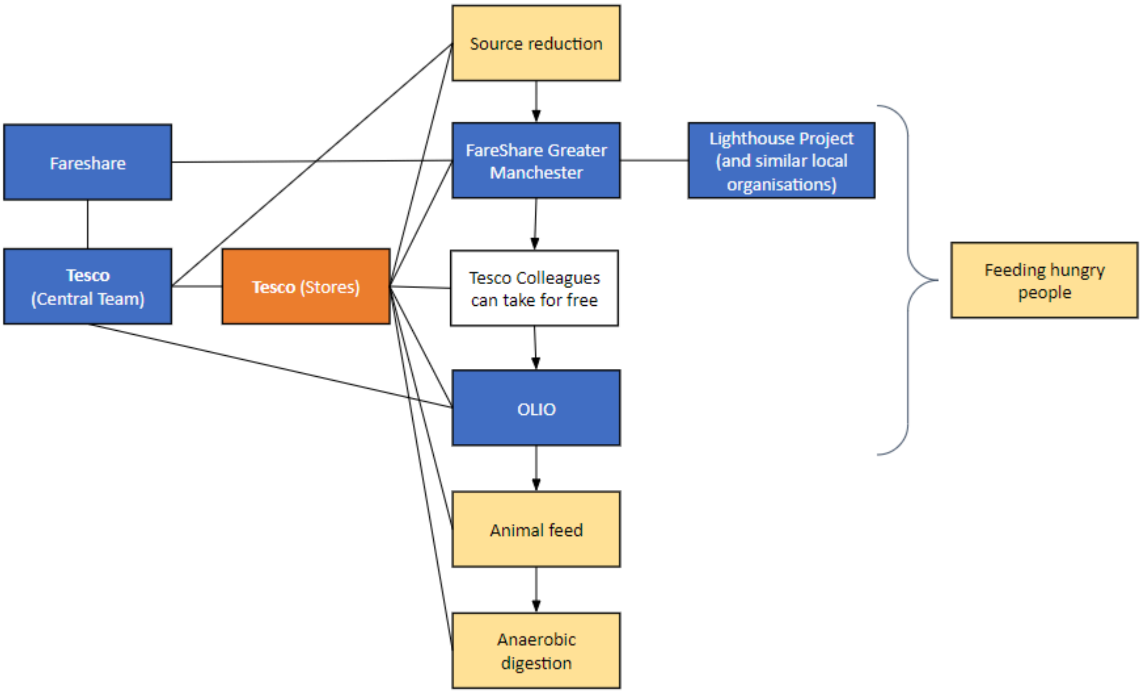


Figure 6B: Tesco network map demonstrating their alignment with the food waste hierarchy.



6.3.2 Contribution to policy - defining social enterprises and charities (3B)

Social enterprises were central to this study. However, it became clear that the line between them and charities is not clear-cut. Using the definition from the literature review (*A social enterprise is a financially sustainable organisation which is primarily achieved through trading of a product or service. It prioritises a social goal above all else, whether non-profit or for-profit, and exists in the interests of its societal beneficiaries.)*, some organisations which could be defined as social enterprises were registered as charities, and some organisations operated both a charitable and entrepreneurial arm. This makes them difficult to define as one or the other, and many in this sector actually operate as both.

For example, the Lighthouse Project in Middleton, UK, operates as a hub for local people, offering both a food bank and a food pantry alongside other support services. This local hub model is also reflected in other organisations across the UK, where people in need can visit a one-stop-shop type of location for holistic support. They often receive funding from a variety of sources, including local councils, meaning that as an organisation they do not meet the criteria as a social enterprise, but in some cases, the food pantry part of the organisation is sustained through its own trading income, meaning that it is operating as both. This is similar in the wider UK charity sector, for example, where charities have shops on local high streets which are sustained through trading. This further supports the idea of the blurring of the lines between social enterprise and charities in the UK.

A new proposed concept which encompasses both charities and social enterprises could benefit both entities and prevent them from having to navigate the legalities of both structures. In some cases, social enterprises are for-profit (for example, Too Good to Go and Olio), and in others they are non-profit (for example, Lighthouse Project and Cracking Good Food). The differentiating factor between charities and social enterprises is in the ability of social enterprises to use trading as a means of achieving sustainability within the organisation (see Figure 3M). However, especially when it relates to funding opportunities and support, it may help to instead define them as for-profit or not-for-profit, allowing those social enterprises who are not-for-profit to be able to access similar funding opportunities to charities, whilst still excluding profit-making organisations from such opportunities.

The working definition which could be used to differentiate between non-profit and for-profit organisations, could therefore be used instead:

A social enterprise is a financially sustainable organisation which is primarily achieved through trading of a product or service. It prioritises a social goal above all else, whether non-profit or for-profit, and exists in the interests of its societal beneficiaries.

6.4 Research question 4

> Are there any key **facilitating factors** to support the effectiveness of managing food surplus, and do they differ between strong and weak ties?
>
> A. Network effectiveness within food waste supply chains in the UK relies upon strong ties between retailers and distribution organisations.
> B. Range of factors identified as primary and secondary facilitators to network effectiveness.

6.4.1 Contribution to theory - strong ties lead to an effective product-based network (4A)

Granovetter's strength of weak ties theory was not supported fully by this research, as it was demonstrated here that strong ties are the main facilitators of effectiveness in this network. Granovetter (1973) stated that *"Stress is laid on the* *cohesive power of weak ties"* (p.1360), which this research does not support. Across each of the supermarket cases, they prioritised a small number of strong ties for redistribution of surplus food over many weak ones (Figures 5B, 5E, and 5H), with many holding a mix of national-level relationships which are operationalised within all stores and some locally managed arrangements which are more informal.

Comments from various nodes within the network support the need for fewer strong ties over many weak ones - for example, where a social enterprise decided to end a relationship with a particular supermarket due to a lack of reliability, and where the tie was weak - *"We had a similar relationship with Aldi locally, but the time it took to get the stuff really wasn't worth it in terms of what we're getting on a regular basis from them."* (Interview 15, Lighthouse Project). This is also supported by the fact that the majority of key relationships which the interviewees described as most effective, were also identified and categorised as strong ties (Tesco - relationships 1, 2, 3, 4, 5; Morrisons - relationships 1, 2, 3, 4, 5; Co-op - relationships 1, 2, 3, 4, 5).

6.4.2 Contribution to practice - range of factors identified as primary and secondary facilitators to network effectiveness.

A range of factors were identified across the three cases, some of which were consistent across all cases and some which were unique to one or two of the cases. To highlight the factors which were common across all cases, could indicate where there may be consistencies in facilitating the network.

The four main factors which would appear to facilitate the network are:

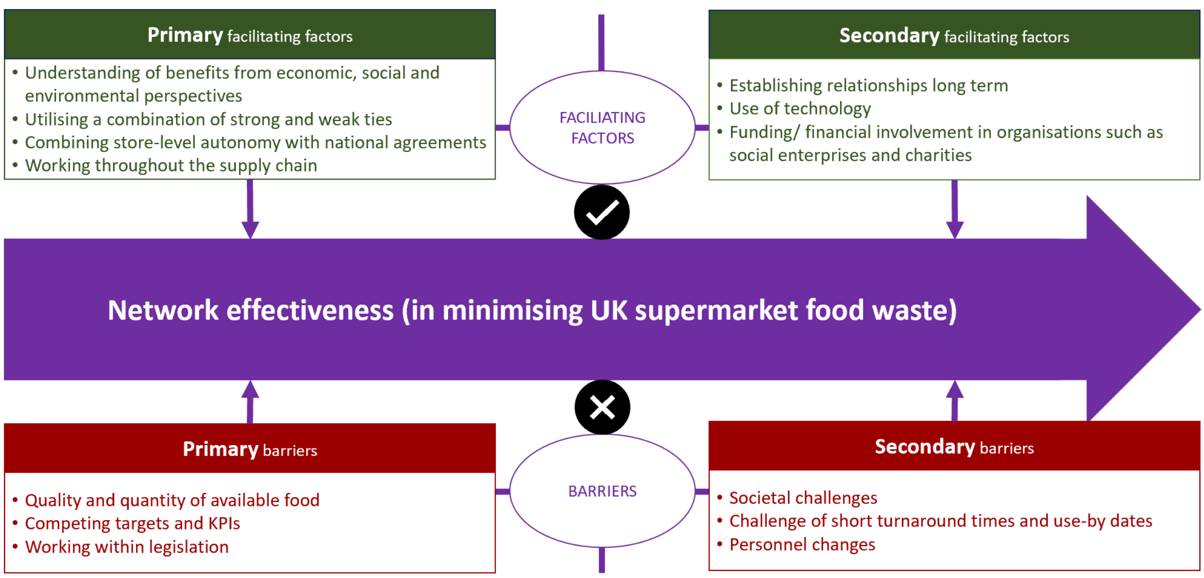
- Utilising a combination of strong and weak ties (Tesco, Morrisons, Co-op);
- Understanding the benefits from economic, social and environmental perspectives (Tesco, Morrisons, Co-op);
- Using a combination of store-level autonomy and national/regional agreements (Tesco, Morrisons, Co-op);
- Working throughout the supply chain (Tesco, Morrisons, Co-op).

Utilising a combination of strong and weak ties is in support of Granovetter's theory, and this research demonstrates that this enables the network to operate effectively, in addition to having an understanding of all of the possible benefits of food waste reduction, which means that whatever the supermarket is prioritising - money, people or the environment - addressing food waste can have an impact on all three. Working throughout the supply chain indicates a commitment to reducing food waste beyond the stores which are in the supermarket's immediate control, and may not even impact their statistics in some cases. Should a supermarket engage in this way, it demonstrates a holistic approach which can be of benefit to the supermarkets and also the wider network of stakeholders.

Using a combination of store-level autonomy and national/regional agreements was indeed the case across all three cases. Each supermarket showed that individual stores had some decision-making authority over where the surplus food went - *"It is really about nurturing that relationship between the charity and the individual store which is really down to store managers more than anything"* (Interview 1, Tesco), but with all three implementing national/regional-level agreements with larger organisations to work alongside it - *"We basically have a hierarchy of how we donate our food. It first is offered to our charity partners, then to colleagues and to Olio, and then will be sent to be turned into animal feed and then, lastly, it'll be anaerobically digested"* (Interview 1, Tesco). This includes Co-op, for example, who work with Too Good To Go, Fareshare and Bread and Butter Thing on a larger scale, but also operate the Caboodle and Co-op Food Share platforms to better support individual and local donating (Figure 5H).

This has been visualised and developed into a model. Figure 6C demonstrates the facilitating factors and barriers identified through this study, representing those which are common across all cases as the primary factors, and those which were included in only one or two of the cases are listed as the secondary factors,

Figure 6C: Model demonstrating the facilitating factors and barriers to network effectiveness, in the context of minimising UK supermarket food waste.



This model expresses these primary and secondary factors visually, alongside the barriers, to demonstrate these findings in a way which could be tested in future research, or applied in practice.

6.5 Research question 5

Are there any **barriers** to the effectiveness of managing food surplus, and do they differ between strong and weak ties?

A. Supermarkets are not looking to optimise their supply chains for efficiency fully and have, in fact, continued to 'over order' from suppliers purposefully to ensure that they can provide for charities and local organisations.
B. Range of factors identified as primary and secondary barriers to network effectiveness.

6.5.1 Contribution to policy - supermarkets over-ordering to ensure that they can provide for charities and local organisations.

Food waste policy in the UK follows the food waste hierarchy as discussed in research question 2, which prioritises source reduction over redistribution. However, one of the key barriers identified within the network makes this difficult to fully apply within supermarkets. Competing KPIs and targets around reducing food waste and increasing food donations lead to a situation where both cannot be met, and when coupled with the supermarkets' commitment to helping communities, this creates a disconnect between national policy, supermarket policy and communities.

Tesco addressed this issue directly in the interview, outlining the difficulty of attempting to meet both targets. They commented that they purposely order more than is required by a store on purpose so that they can continue to support local organisations, Fareshare and people in need within their communities - *"Most of that stuff [forecasting] is automated but it's how much we put our settings on to make sure we order enough that customers can get it, but also order not too much that we waste, but we waste enough that charity partners can get it. You've got like 3 competing KPIs there and there's no perfect way."* (Interview 1, Tesco). They see this as an important issue for supermarkets to address, and highlight a social responsibility to help those who need it - *"Some charities have sort of become dependent on the link to Tesco. Obviously we don't want them to go down or anything, so it's about how we support them and how everyone survives."* (Interview 1, Tesco).

This has implications for both policy and practice, and highlights an issue which is currently not being addressed by policy makers. It could perhaps be the case that percentages could be used by supermarkets in place of volume increases and decreases, aiming to move a percentage of the waste which currently goes to anaerobic digestion or green energy to redistribution. This would reduce the competition between the various targets and therefore the barrier which exists in increasing food redistribution. For policy makers, this should be taken into account as a key issue in food waste reduction and supporting people through societal challenges such as the cost-of-living crisis, as the supermarkets could stop seeing this as a responsibility for them to address and would instead need to be addressed by the government.

6.5.2 Contribution to practice - range of factors identified as primary and secondary barriers to network effectiveness.

A range of factors were identified across the three cases, some of which were consistent across all cases and some which were unique to one or two of the cases. To highlight the factors which were common across all cases, could indicate where there may be consistencies in the factors which act as barriers within the network.

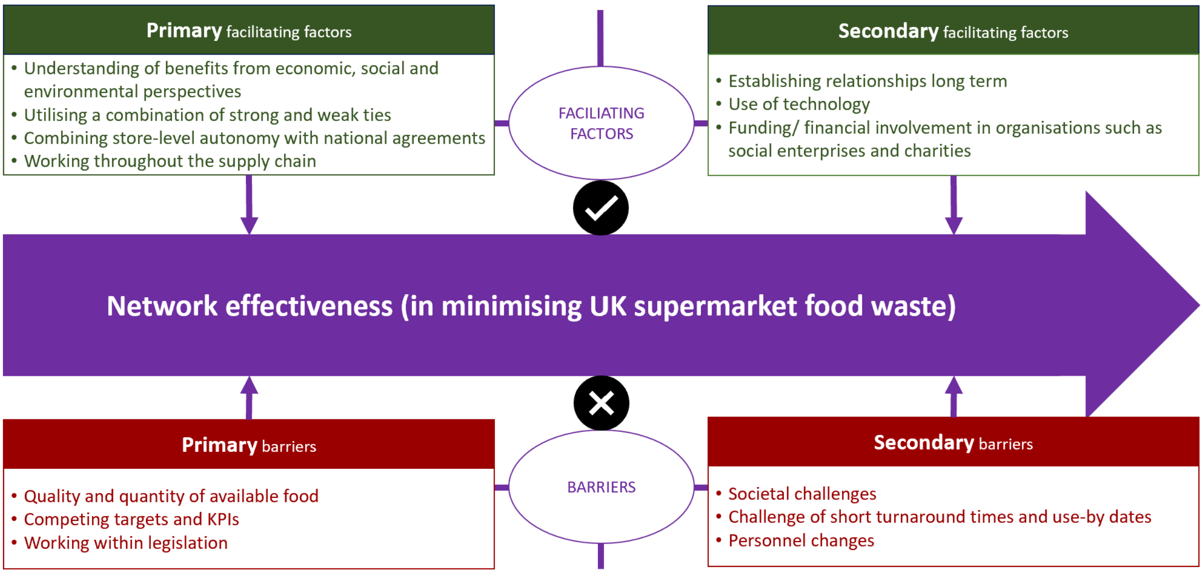
The three main factors which would appear to act as barriers to network effectiveness are:

- Quality and quantity of food available (Tesco, Morrisons, Co-op);
- Competing targets and key performance indicators (KPIs) (Tesco, Morrisons, Co-op);
- Legislation (Tesco, Morrisons, Co-op).

These three barriers highlight the key concerns faced within the network, across both supermarkets and community organisations. For supermarkets, if they have lower or variable quantities of food waste each day, this could be demonstrating good management of forecasting and ordering, but makes it more challenging for food redistribution organisations to rely on them for consistent surplus. The issue of competing KPIs is again relevant here, as if those relationships are required, they need to ensure some consistency, but this goes against the target of lowering the amount of food waste as much as possible. Legislation is not necessarily something that can or should be changed as it exists for good reason, but how this legislation is dealt with by supermarkets and community organisations perhaps needs to be readdressed as it is currently acting as a barrier to full network effectiveness.

This has been visualised and developed into a model. Figure 6C demonstrates the facilitating factors and barriers identified through this study, representing those which are common across all cases as the primary factors, and those which were included in only one or two of the cases are listed as the secondary factors,

Figure 6C: Model demonstrating the facilitating factors and barriers to network effectiveness, in the context of minimising UK supermarket food waste.



This model expresses these primary and secondary barriers visually, alongside the facilitating factors, to demonstrate these findings in a way which could be tested in future research, or applied in practice.

6.6 Research question 6

What are the key **motivations** of food waste reduction stakeholders to partake in the network? A. Whether supermarkets are acting on a self-interest basis or on genuine motivations, the outcomes would appear to be similar.

6.6.1 Contribution to theory

Monge and Contractor (2001) identified Granovetter's theory as a 'self-interest' theory, where individuals act in their own interests as their motivation for engaging in social actions, which could be argued is supported in this research. The facilitating factors identified in research question 4 included that having an understanding of the benefits of food waste reduction from economic, social and environmental perspectives have shown to improve the effectiveness of the network. This understanding demonstrates that they are aware of the benefits to themselves, and implies that this understanding improves the likelihood of participating in actions to reduce food waste - *"What customers think of the business is really the main driver of all of this. If a customer sees that Tesco's is really into FareShare and donates 2 million meals, they are way more likely to come back."* (Interview 1, Tesco); *"It's just* *sell first and food banks second”* (Interview 3, Co-op). However, they also engage in certain actions which would appear to be evidence for acting genuinely in the interests of society and/or the environment - *“It's about how we support them and how everyone survives.”* (Interview 1, Tesco); *“Our stores are empowered to give surplus food to local causes such as food banks. They distributed 2 million products this way in 2022.”* (Morrisons, 2023b). This differentiation makes it unclear if the outcomes would be different either way.

6.7 Limitations of the study

Limitations of this study include:

- Access to participants was found to be challenging in this sector, as it is such a current area of focus globally, and a growing area for many supermarkets. It may have been the case that they were either too busy to discuss it or were still growing and developing their own approach to food waste reduction. This was especially the case during the COVID-19 pandemic, which this research time period covered, as the targeted sample were particularly pre-occupied during this time and their resources needed more urgently elsewhere. Ultimately, the participants who were willing to take part represented three of the major UK supermarkets and secondary data was used to support the primary data.
- Representativeness of the sample could be seen as a limitation, however, incorporating a wide range of secondary data has supported this research to triangulate the primary data gathered. Many of the key organisations in the food

redistribution area were willing to take part and so the resulting data encompasses a large part of the network. Other types of organisation could have been included for further understanding of the wider context within the network, such as anaerobic digestion and animal feed services, however, redistribution was the key focus of the research question, and the decision was taken to solely focus on those organisations involved at that stage of the hierarchy.

6.8 Scope for future research

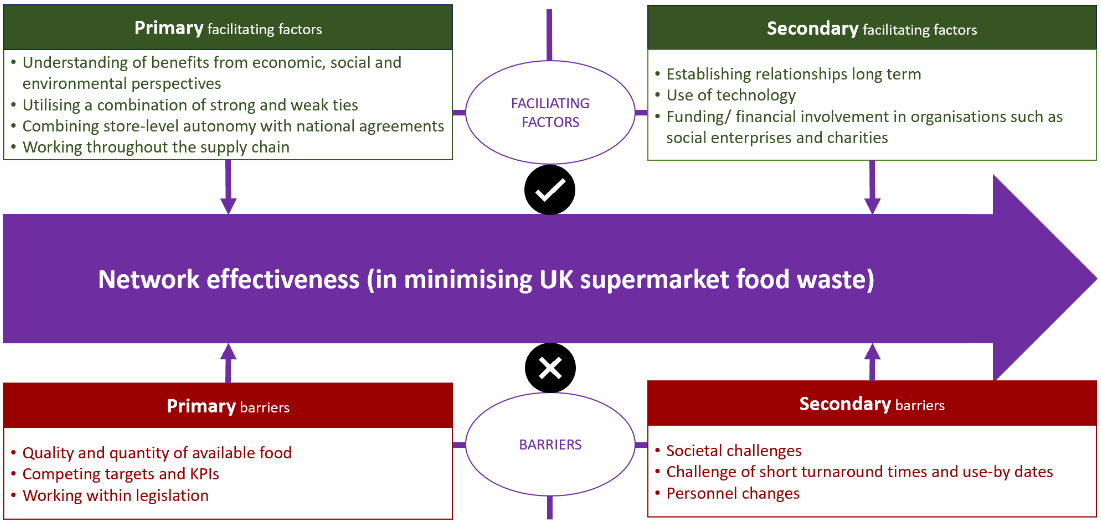
There are many directions which could be taken following this research in order to further expand upon the findings.

Firstly, the research could be expanded using other UK supermarkets, or indeed duplicated overseas to compare the findings to those in other countries and/or regulatory settings.The literature review demonstrated supply chain differences in different parts of the world in terms of food waste, so looking at a different country's perspective could expand the scope of the findings both at the retail part of the supply chain and beyond.

Secondly, along those lines, other points in the food waste hierarchy or other parts of the supply chain could be chosen to further the research, aiming to identify differences between, for example, consumer food waste and manufacturing food waste.

Thirdly, the model developed as part of research questions 4 and 5 demonstrates the facilitating factors and barriers to network effectiveness, in the context of minimising UK supermarket food waste. There is scope for this model to be further tested in several different ways, primarily in assessing the impact of networks on resource utilisation in other contexts.

Figure 6C: Model demonstrating the facilitating factors and barriers to network effectiveness, in the context of minimising UK supermarket food waste.



This could mean supermarket food waste in different countries, different types of resource such as plastic waste, or different UK food waste contexts such as hospitality or farming. Each of these gives scope for further research, as it enables testing of the model and its potential future applications.

Finally, application of a different theory, such as social capital theory (section 2.3.1.3) could help to further explore the individual ties within the network using an alternative theoretical lens to better understand the interpersonal relationships within it.

In summary there are a number of potential routes to take to further this research. As a qualitative study it provides an exploratory insight which can be used for further expansion in many different directions as outlined in this section.

6.9 Summary

The overarching research question that this study aimed to answer was as follows:

> *"How do UK-based supermarkets utilise their network ties with social enterprises and government contacts to effectively reduce their food waste within the supply chain?"*

Within this question, the following six subsidiary research questions which have been discussed throughout this thesis have sought to contribute to this overarching question.

1. Are UK supermarkets' food surplus networks comprised of **both strong and weak ties** with social enterprises, governments and other supporting organisations?
2. How do the strong and weak ties within the network effectively enable social enterprises to assist in managing supermarket food surplus, and how does this align with the **food waste hierarchy**?

3. Do **social enterprises** form a key component of UK supermarkets' food surplus networks?
4. Are there any key **facilitating factors** to support the effectiveness of managing food surplus, and do they differ between strong and weak ties?
5. Are there any **barriers** to the effectiveness of managing food surplus, and do they differ between strong and weak ties?
6. What are the key **motivations** of food waste reduction stakeholders to partake in the network?

Ultimately, each of these questions and the subsequent discussions and evidence provided around each have led to the conclusions provided within this chapter, and have attempted to provide an answer to the overall research question. The key takeaway is the model which has been developed (Figure 6C) to better understand network effectiveness and the key facilitators and barriers involved in the context of UK supermarket food waste management, which can be tested in future research against different contexts.

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8.0 APPENDICES

Appendix 1: Email to potential interviewees

Dear **,

The role of social enterprises in reducing retailer food waste

I am researching for a PhD at the University of Birmingham, conducting a study exploring the issue of food waste, and ** has come up a couple of times in my interviews with north-west organisations so far as a key relationship. As part of my study, I am keen to understand the role of social enterprises in reducing retailer food waste in the UK, and have identified that ** is a key organisation in managing food waste redistribution in the UK. I believe you would be able to help me better understand how your processes and networks operate, and hope that you are willing to help.

I would like to conduct an interview with you via Zoom (or another communication medium of your choice). I would anticipate the interview lasting for approximately one hour. In the interview, I will aim to understand how ** operates its food waste policies, how you utilise your networks and how current national food waste policy affects your organisation.

I would be happy to provide you with a letter of recommendation from my academic supervisors in support of my research should you wish, and I attach here a more detailed outline of the background and nature of the research.

I can be flexible in terms of organising an interview date for when suits you. As some opening suggestions, I could offer **. However, please do let me know if these are not suitable for you and we can look later into the month.

I hope you will be able to help me with this important research by providing me with an interview and look forward to hearing from you regarding a date and time. I will then send over a Zoom link once confirmed. I am also happy to share my findings with you once everything is written up.

Yours sincerely,

Samantha Sandilands
PhD Researcher
Birmingham Business School
University of Birmingham

Appendix 2: Participant information sheet

Participant Information Sheet – social enterprises and food waste networks.
Samantha Sandilands, University of Birmingham, PhD Management student

You are being invited to take part in a research project. Before you agree to participate it is important for you to understand why the research is being done and what participation will involve. Please take time to read the following information carefully and discuss it with others if you wish. Feel free to ask if there is anything that is not clear or if you would like more information.

Who am I?
My name is Samantha, I am a Business School researcher at the University of Birmingham in the UK, currently studying food waste reduction networks and social enterprises for my PhD thesis. Food waste is a topic I have been interested in for a long time, which led me to pursue this at PhD level.

What am I doing?
I have a particular interest in researching the networks involved in managing food waste and how this affects the operation of social enterprises who are aiming to reduce levels of surplus food, and their ability to influence within those networks. The purpose of this research is to establish where there are strong relationships between different combinations of supermarkets and social enterprises and whether this has an impact on the effectiveness of the food waste reduction operation. I am also interested to understand the role that government regulation plays in this and whether changes to policy could assist in further food waste reduction.

What am I asking for?

I would like to conduct an online interview with you either in person or via Zoom (or a platform preferable to you), which I anticipate lasting no longer than one hour. In the interview, I hope to gather your thoughts and experiences on working as part of the efforts to reduce food waste in the UK, and will help me to identify your network contacts. Please note that the audio of the interview will be recorded, with your consent.

What will I do with the information?

The audio recordings made during this research will be used only for analysis and unattributed quotes taken for illustration purposes. No other use will be made of them without your written permission, and no one outside the project will be allowed access to the original recordings.

All the information that I collect during the course of the research will be anonymised. You will not be personally identified in any ensuing reports or publications, although you should be aware that it may be possible for someone to identify your organisation should they choose to attempt it.

The research will be submitted as part of my PhD thesis and then written up into a selection of academic papers which will hopefully be published in academic journals and presented at academic conferences.

Contact for further information

For your records, if you wish to contact me again in the future, you can do so at [redacted]. If you have any problems or wish to contact my supervisors for any reason, you can contact Dr Mark Hall ([redacted]) or Professor Daniel Chicksand ([redacted]).

Appendix 3: Participant consent form

Consent form

This information is being collected as part of a doctoral research project concerned with food waste networks and social enterprise effectiveness by the Birmingham Business School in the University of Birmingham.

The information which you supply and that which may be collected as part of the research project will be entered into a filing system or database and will only be accessed by authorised personnel involved in the project.

The information will be retained by the University of Birmingham and will only be used for the purpose of research, and statistical and audit purposes. By supplying this information, you are consenting to the University storing your information for the purposes stated above. The information will be processed by the University of Birmingham in accordance with the provisions of the General Data Protection Regulations (GDPR). No identifiable personal data will be published.

By signing this form, you are agreeing to the following statements.

- I confirm that I have read and understand the participant information leaflet for this study. I have had the opportunity to ask questions if necessary and have had these answered satisfactorily.
- I understand that my participation is voluntary and that I am free to withdraw at any time following my interview without giving any reason. If I withdraw, best attempts will be made to remove all data in accordance with the level of analysis already undertaken.
- I understand that my personal data will be processed for the purposes detailed above, in accordance with the Data Protection Act 1998.

Based upon the above, I agree to take part in this study.

Name of participant……………………… Organisation………………………………

Date…………… Signature………………..

Name of researcher/ individual obtaining consent: Samantha Sandilands

Date…………… Signature………………..

Appendix 4: Interview schedule

Research Interview Questions – Social Enterprises and Retailers

<table>
<tr><td></td><td></td></tr>
<tr><td rowspan="2">1</td><td>SOCIAL ENTERPRISES ONLY:
● Please could you tell me a bit about your company, including your overall aims and objectives?
● What do your statistics look like?
○ How much of the food that you take in goes to humans, animals, recycling, anaerobic digestion, and composting? (Ask each of these separately)
○ Do you redirect any food you cannot use, and if so, then where to?</td></tr>
<tr><td>SUPERMARKETS ONLY:
● What is your food waste strategy and targets for your store?
● Who is responsible for the implementation of the strategy and what is your role within this? What does the structure look like?
● What do your food waste statistics look like?
o How much food waste, on average, would you say goes to humans, animals, recycling, anaerobic digestion, and composting? (Ask each of these separately)</td></tr>
<tr><td>2</td><td>● I am going to ask you firstly about your relationships with (other) supermarkets, and then about your relationships with (other) social enterprises.
● Social enterprises are defined as “income generating businesses with a social or environmental mission at their core”, in this instance, reducing food waste.
● Which supermarket(s)/social enterprise(s) in the UK do you currently work with?
● For each, I have a set of questions to go through:
a) How much company time is spent on your relationship with them? (t)
b) How often would you say you are in contact with them? (t)
c) How long have you been working with them? (t)
d) Would you say that you trust them to deliver any agreed actions? (i)
Strongly disagree / Disagree / Neither / Agree / Strongly Agree
e) Would you seek advice from your contacts in this organisation? (i)
Strongly disagree / Disagree / Neither / Agree / Strongly Agree</td></tr>
</table>

	f) Would you say you are able to exchange confidential information with them? (c) Strongly disagree / Disagree / Neither / Agree / Strongly Agree g) Would you say you benefit each other reciprocally? Is it weighted towards you or them, or is it approximately equally balanced? (r) h) How strong would you say your relationship is with that supermarket/social enterprise overall on a scale of 1-10? (triangulation) ● Replicate for each supermarket and social enterprise.
	Does your company work with the government, and if so, can you tell me about that relationship? a) Do you collaborate with either local or national government on food waste? b) Do you find that having a relationship is useful, or if you don’t have one, do you think it could be useful? Why? c) Do you have a specific contact or multiple contacts within the government? Do others from your company work with the government, specifically on food waste? Thinking about your government contacts: d) How much company time is spent on your relationship with them? (t) e) How often would you say you are in contact with them? (t) f) How long have you been working with them? (t) g) Would you say that you trust them to deliver any agreed actions? (i) Strongly disagree / Disagree / Neither / Agree / Strongly Agree h) Would you seek advice from your contacts in this organisation? (i) Strongly disagree / Disagree / Neither / Agree / Strongly Agree i) Would you say you are able to exchange confidential information with them? (c) Strongly disagree / Disagree / Neither / Agree / Strongly Agree j) Would you say you benefit each other reciprocally? Is it weighted towards you or them, or is it approximately equally balanced? (r) k) How strong would you say your relationship is with that supermarket/social enterprise overall on a scale of 1-10? (triangulation)
3	The food waste policy in the UK at the moment is centred around voluntary agreements as part of the Courtauld 2025 agreement, which food producing companies can sign up to be a part of, with the overall aim to reduce food waste by 20% by 2025. ● Has your organisation had any influence on the current food waste policy, e.g. via consultations, meetings, informally?

	● Do you know of any others in your network that have had any input into it?
4	Do you feel that the current food waste policy has an impact upon your company? Please explain your answer. ● Does it affect your relationships with other food organisations? ● Does the policy make your work easier or more difficult? Why?
5	● What would your ideal food waste reduction policy look like? ● What is the ultimate goal?

Research Interview Questions – Government

1	Please could you tell me about your department, including your aims and objectives?
2	Could you explain the current policy on food waste and any plans or considerations for future developments? Do you have any statistics you can share?
3	Does your department work with any supermarkets on food waste reduction, and if so, can you tell me about how that works? ● Do you find having a relationship is useful? If you don't have one, do you think it could be useful? ● How long have you worked with them? ● Do you have a specific contact or multiple contacts within the organisation? Do others from your department work with the organisation? Thinking about your supermarket contacts one at a time: ● How much company time is spent on your relationship with them? (t) ● How often would you say you are in contact with them? (t) ● How long have you been working with them? (t) ● Would you say that you trust them to deliver any agreed actions? (i) ● Would you seek advice from your contacts in this organisation? (i) ● Would you say you are able to exchange confidential information with them? (c) ● Would you say you benefit each other reciprocally? Is it weighted towards you or them, or is it approximately equally balanced? (r) ● How strong would you say your relationship is with that supermarket/social enterprise overall? (triangulation)
4	Does your department work with any social enterprises on food waste reduction, and if so, can you tell me about that?

	● Do you find having a relationship is useful? If you don't have one, do you think it could be useful? ● How long have you worked with them? ● Do you have a specific contact or multiple contacts within the social enterprise? Do others from your department work with the social enterprise? Thinking about your social enterprise contacts one at a time: ● How much company time is spent on your relationship with them? (t) ● How often would you say you are in contact with them? (t) ● How long have you been working with them? (t) ● Would you say that you trust them to deliver any agreed actions? (i) ● Would you seek advice from your contacts in this organisation? (i) ● Would you say you are able to exchange confidential information with them? (c) ● Would you say you benefit each other reciprocally? Is it weighted towards you or them, or is it approximately equally balanced? (r) ● How strong would you say your relationship is with that supermarket/social enterprise overall? (triangulation)
5	a) Who would you say are your most important stakeholders to work with? b) Who is your most useful contact in the area of food waste and why?
6	● How did the current food waste policies come into being and what was the process? ● Did you engage with any other key stakeholders? ● Did any changes to the policy come about as a result of your relationships with key stakeholders?
7	What impact do you think the current food waste policies have had so far on other stakeholders working in the area of food waste? Have you engaged with any of them to find this information out?
8	Do you think the current food waste policies have had a wider impact, for example on consumers, the economy etc? Was this the desired effect?
9	How do you feel about current levels of food waste? Does it need to change? Why is this issue important to you? Who should be responsible?
10	What would your ideal food system look like? What is the ultimate goal?