

The factors that influence the successful adoption of food waste policies by food retailers in the UK

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Ethical approval reference number: 241015

**Submitted in partial fulfillment of the requirements for the degree of Master of Science, program Public Administration,
University of Twente**

2023- 2024

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ABSTRACT

Acknowledging the food waste problem among retailers in the United Kingdom, this research aims to understand the factors influencing the successful adoption of food waste management practices among retailers in the UK. Using qualitative research methods, this study explores the retailer's motivation to innovate food waste reduction initiatives, the challenges they encounter, and the assets available to them. Retailers in the UK were motivated to innovate food waste policies by environmental effects of food waste, targets set to reduce food waste and financial effects of food waste which have influenced them to work with other stakeholders and explore sustainability approaches. However, obstacles such as the impact of COVID-19 and corporate policies focused on making profits hindered the full adoption of these food waste reduction practices. Resources, including food waste programs, technology, and trained employees, were crucial in enabling the successful adoption of food waste management policies. This thesis aimed to inform policy decisions and offered policy recommendations to policy makers on how these factors could be leveraged to reduce and prevent food waste among retailers in the UK and worldwide.

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1. Introduction

Food waste is a critical issue globally, and reducing it is a significant concern because it causes adverse effects on the environment, economy, and society (Abiad & Meho, 2018). Food waste pertains to the disposal of food suitable for human consumption, which is often due to spoilage, though other factors such as market oversupply or individual consumer shopping and eating habits (Food and Agricultural Organizations, 2013). Food produced worldwide, and unused is about one-third (1.6 billion tonnes), the European Union (EU) generates about 88 million tonnes of food waste annually, accounting for around 5% of the worldwide total (FUSIONS, 2016). Three significant WRAP (Waste and Resources Action Programme) investigations conducted in 2013 and 2016 gauged the yearly occurrence of food waste across UK households, hospitality and food service, food manufacturing, as well as retail and wholesale sectors, to be approximately 10 million tonnes (Estimates Of Food Surplus And Waste Arisings in The UK, 2017). Reports issued by WRAP from 2015 to 2018 indicate that retail food waste had risen to 277,000 tonnes in the UK, up from 260,000 tonnes in 2015 (Parry et al., 2020).

There are many reasons to be concerned about food waste. First, are the environmental implications as food waste leads to substantial carbon emissions, resource wastage, growing starvation, and deprivation (Kummu et al., 2012; FAO, 2013; Schrank et al., 2023). At the same time food waste gives rise to gaseous poisons that threaten the environment and the people (Sharma, Gaur, Kim & Pandey, 2020). Additionally, Martin-Rios, Hofmann, and Mackenzie (2021) note that food waste results in the exhaustion of scarce resources such as water, land, and other resources and Buzby and Hyman (2012) observed that food waste escalates food insecurity by reducing food availability worldwide and locally, increasing food prices, and encouraging the unsustainable use of natural resources that limit food production in the future. The growing attention to the damage caused by food waste, both environmentally and economically (FAO, 2019), has resulted in a general agreement from both the public and political space on the urgency to resolve this issue.

The primary factors contributing to food waste generation at retail stores, as outlined by Buzby et al. (2015), include packaging damage, overstocking, and over-preparing, which are associated with challenges in accurately forecasting customer demand. Food waste comes from unsellable products that must be disposed of or recycled in the retail sector. Consequently, food waste in retail poses a significant commercial challenge due to the narrow profit margins on food items and escalating operating expenses, especially at the store level. Another concern for grocery retailers is that many discarded products are still suitable for consumption. This moral aspect of food waste places increasing pressure on retailers to demonstrate corporate social responsibility towards the environment and communities, compelling them to reduce and recover food waste (Giuseppe et al., 2014; Gruber et al., 2016; Teller et al., 2018). According to Smith et al. (2015), certain retailers have opted to ease their quality standards during periods of low supply, especially regarding the appearance of fruits and vegetables. This temporary relaxation of standards enables greater regulatory flexibility and ultimately aids in minimizing food waste.

Retailers can adopt food waste reduction strategies in order to reduce food waste, Gruber et al. (2016) suggests that store managers have the potential to play an active role in reducing food waste by increasing flexibility and accountability, which leads to greater autonomy for store managers, hence taking proactive measures to reduce food waste (De Moraes et al., 2020). Moreover, Derqui et al. (2018) highlights the

importance of collaboration with logistics partners to minimize safety stocks and working closely with suppliers to adapt products to meet buyers' needs (De Moraes et al.,2020). Macfadyen et al. (2015) states that retailers can instigate significant transformations by spreading innovations and information across the food supply chain by influencing decision-making at both ends of the supply chain. They also serve as coordinators and crucial communication intermediaries between consumers and other chain members; this is because retailers serve as centralized hubs for significant quantities of food within a confined and delineated number of sites, hence easing the execution of policies and initiatives by bridging the gap between two sectors namely consumers and producers (Eriksson,2015). Furthermore, De Araujo Santos (2016) highlighted that retailers can access research, methodologies, technologies, and events related to loss prevention for example digital technologies that facilitate food sharing and donation through online apps (Harvey et al., 2019) and the food waste reduction roadmap toolkit provided by WRAP and IGD (Food Waste Reduction Roadmap Toolkit, 2023).Hence, they represent potential subjects for research into food waste, both in understanding its causes and implementing reduction practices (De Moraes et al., 2020).

Retailers adopt food waste reduction strategies to achieve the goal of adhering to regulations, enhance their business reputation, and boost operational efficiency. Consequently, they have adopted various strategies to handle food waste such as price reductions on food items nearing expiration dates, consumer awareness initiatives, (Yang et al., 2023). While reducing stocking levels is a straightforward method to minimize food waste (Lee & Tongarlak, 2017), it may decrease customer satisfaction. Instead, they have embraced alternative operational practices and strategies to achieve more effective food waste reduction (Teller et al., 2018; Kakadellis & Harris,2020). Huang et al. (2021) found that forty-eight out of one hundred twenty-four retailers studied utilized price reductions to encourage the sale of products nearing expiration, often through methods like "bargain shelves" or "reduce to clear" policies. Retailers also improved product packaging for functionality, reduced handling damage, and extended shelf life. Internal processes were optimized through staff training, technology use, temperature monitoring, forecasting improvements, and waste documentation. Staff training emerged as a crucial strategy. Also, retailers collaborated with suppliers to minimize transit times, prolonging shelf life.

The UK Food Waste Reduction Roadmap, launched in 2018, is a collaborative effort between WRAP (Waste and Resources Action Programme) and the Institute of Grocery Distribution (IGD). It outlines a set of goals aimed at reducing food waste across various sectors, including retail, food production, manufacturing, and hospitality. The roadmap provides clear steps for these industries to follow to tackle food waste throughout the UK (Dray,2021). A 2020 progress report (WRAP et al., 2020) indicated that 261 out of 615 major food businesses in the UK, including 16 retailers, had committed to the Food Waste Reduction Roadmap in 2018 which aims for all the 615 major food businesses to implement the Target, Measure and Act framework by 2030. Therefore, building on the 2018 commitment, this research aimed to explore the factors that influenced retailers to adopt food waste management practices. The study examined these influences both three years prior to and three years following the 2018 launch, providing an analysis of the retailer's practices over this period. It is, therefore, interesting to ask, ***What factors influenced the successful adoption of food waste management practices among retailers in the United Kingdom between 2015-2021?***

This research aims to provide a structured approach to the existing body of literature in food waste and retail such as the root causes of food waste in retail, grocery food waste initiatives and role of retailers in creating a resilient food supply chain, this literature lacks a cohesive structure that connects to the elements driving adoption of food waste management practices. The lack of a cohesive structure is problematic because retailers play a critical role in the food supply chain by connecting suppliers and consumers, hence retailers' practices greatly impact the overall food waste levels. By focusing on the factors that influence retailers to successfully adopt food waste practices, this thesis provides clarity and organization to the existing literature, thus looking at actual food waste practices, providing guidance for further research and for stakeholders who seek to influence effective food waste reduction practices among retailers.

Research question

What factors influenced the successful adoption of food waste management practices among food retailers in the United Kingdom between 2015-2021?

To answer this question, the following sub questions were formulated, these sub questions were derived from the theoretical framework by Mohr (1969) on the determinants of innovation in organizations. This structure provides a foundation for understanding the key factors influencing the adoption of food waste management practices.

SQ1. How does retailer's motivation to innovate influence successful adoption of food waste management practices?

SQ2. How do organizational obstacles to retailers influence successful adoption of food waste management practices?

SQ3. How do retailers' resources influence successful adoption of food waste management practices?

Food waste among retailers in the UK; Case background, Policy approaches and Laws

There is no legal mandate for reducing food waste in the UK grocery retail sector. Instead, supermarkets address this issue through voluntary public awareness campaigns and voluntary commitments to mitigate food waste. The leading market participant in the "Courtauld Commitment," initiated by the UK government in 2005, aiming to decrease food waste from both the grocery retail sector and households (Jamal & Nepal, 2010). The drive for retailers in the UK to voluntarily adopt food waste reduction policies stems from their commitment to operating sustainably and ethically; this has been evident in the way UK supermarkets integrate food waste into their corporate social responsibility strategies (Filimonau & Gherbin, 2017). Donating food is a key corporate priority for all major UK supermarkets regarding waste mitigation strategies. This emphasis on food donation reflects the increasing public scrutiny faced by UK grocery retailers, particularly following the pioneering actions of the French and Italian governments (Chrisafis, 2016; Gonzales-Torre & Coque, 2016; Kirschgaessner, 2016). The major supermarket chain in the UK (Tesco) acknowledges discarding 55,400 tonnes of food from its stores in 2022, with approximately 30,000 tonnes considered suitable for consumption. While surplus food from its warehouses is occasionally donated to charities, Tesco primarily redirects the bulk of its

store-generated food waste to be utilized as animal feed or processed in anaerobic digestion energy plants (Ankita, 2023).

Collaborating with external stakeholders can influence the increased adoption of preventive measures; hence, organizations such as WRAP partner with food retailers in the UK to combat food waste through voluntary agreements such as the Courtauld Commitment, which aims to reduce UK food waste by 2025. Initiatives like the 'Love Food, Hate Waste' campaign are also employed to assist food retailers in crafting their initiatives to reduce household waste. Similarly, in France, Carrefour has committed to the French Ministry of Agriculture's 'national pact to combat food waste.' This involves altering product labeling to encourage consumption before specific dates and allowing items to remain on shelves for extended periods, reducing food waste. Food retailers also engage in reuse practices involving reusing edible food products for their intended purpose, primarily for human consumption. This is accomplished through various methods such as donating to charities, reprocessing unsold food items, reselling through specialized platforms or stores, repurposing for staff at the store, and arranging for suppliers to exchange surplus goods (Huang et al., 2021).

According to WRAP (2023), food waste in the UK amounted to 10.7 million tonnes in 2021. This estimation encompasses household food waste, hospitality and food service (HaFS), food manufacturing, retail, and the farm sector. Regarding weight, household food waste accounts for 60% of the total, on-farm waste for 15%, manufacturing for 13%, hospitality and food service for 10%, and retail for 2%. Also, a report for WRAP for 2007-2008 indicated that fruits and vegetables were the food categories with the largest share in waste generation by the UK retail sector (Lee, Willis, Hollins & WRAP, 2010). Conversely, another report by Lidl reported that fresh fruits and vegetables (53%, 20,943 tonnes), ambient (15%, 5860 tonnes), bakery products (12%, 4873 tonnes), and chilled items (12%, 4760 tonnes) were the primary contributors to their food waste while meat and poultry were allocated 5% and frozen food 3% (*Lidl Great Britain*, n.d.). Similar to other countries like France, according to Albizzati et al. (2019), on average, over the 20 retail outlets, surplus food largely consists of fruit and vegetables (23%), deli meats (17%), and fresh dairy products (13%) in financial value. Mass-wise, the highest shares are associated with fruit and vegetables (29%), fresh dairy products (23%), and bakery (19%). Also, in Italy, most recorded food waste (36% by weight) originated from the fruits and vegetables department. Additionally, bakery products and packaged cold cuts constituted significant portions of the food waste generated at the stores, accounting for 18% by weight, compared to (15%) Cooked food, (12%) Groceries, (6%) Fresh sea food, (5%) fresh meat and 2% unpacked cold cuts and frozen items; hence, fruits and vegetables were identified as the primary component of the losses. (Cicatiello & Franco, 2020).

2. Theoretical Framework

2.1 Factors that influence adoption of policies/ initiatives

Policy adoption occurs when a unit of government introduces new policies (Walker, 1969), and according to Mohr (1969), innovation refers to the successful establishment of new methods or objectives in a practical situation. There is a tendency to blend the concepts of adoption or adaptiveness with the invention. However, it is crucial to distinguish between invention and innovation. Invention involves creating something new, while innovation involves putting something new into practical use. Mohr (1969) identifies the factors influencing innovation within public agencies. In this context, innovation refers to the degree to which these agencies adopt and prioritize programs that deviate from traditional concerns. The literature proposes that innovation results from the interaction between three key factors: the motivation to innovate, the strength of obstacles hindering innovation, and the availability of resources to overcome these obstacles. Below, I synthesize the literature and explore its usefulness for understanding food waste policy adoption by retailers.

a. Retailer's motivation to innovate

The written work by Mohr reveals an agreement regarding the significance of health officers' attitudes toward fostering innovation in local health departments. Specifically, the health officer's public health belief and inclination towards activism was identified as the most reliable indicator of the likelihood that their organization would introduce and prioritize non-traditional programs. This consensus was further supported by previous research linking innovation to similar attitudes conducive to change, highlighting the importance of leadership, motivation, and behavior. Consequently, the assessment of the health officer's activism and ideology was chosen as a measure of motivation to innovate.

Activism in the context of Mohr's writing is defined as the perception held by the health officer regarding the extent to which their role as a local health officer necessitates engaging with external stakeholders, particularly outside the health department, to gather ideas, support, approval, and resources for departmental programs (Mohr, 1969). Suppose a health officer actively seeks opportunities to influence the health power structure, obtain support beyond local resources, and prioritize interagency collaboration. In that case, it indicates a proactive approach and a strong motivation to innovate and public health ideology is specifically defined as the health officer's viewpoint on the range of services that should be provided by the local public health agency, as opposed to those offered by private and voluntary organizations, particularly those offered by local private enterprises. This motivation is evident through their willingness to engage with various stakeholders and explore new avenues to improve public health services (Mohr, 1969). In the context of retailers, many authors found an attitude of retailers engaging with other stakeholders which is a proactive approach to adopt food waste initiatives such as collaborating with suppliers which involves enhancing the ordering system and optimizing the food supply process (Huang et al., 2021). Also committing to purchasing a set percentage of an order or an entire crop, irrespective of fluctuations in demand (HOUSE OF LORDS & European Union Committee, 2014) in addition reviewing the process with suppliers to identify methods for extending product shelf life and assessing expiry dates, especially for long-lasting products, as noted by CGC Japan (Parry et al., 2015). Furthermore, some organizations have collaborated with suppliers to minimize transit time, thereby

increasing food's shelf life in stores and households. This could also involve direct supplier purchasing and by passing intermediaries (Huang et al., 2021). Working with different stakeholders can stimulate greater uptake of preventative actions. External influencers and policy mechanisms are instrumental in effecting change. In the UK, WRAP partners with food retailers through voluntary accords such as the Courtauld Commitment, targeting a reduction in UK food waste by 2025. Programs like the 'Love Food, Hate Waste' campaign aid retailers in crafting their own approaches to mitigate household food waste (Huang et al., 2021).

Additionally, collaboration among stakeholders can facilitate the development of comprehensive solutions to address food loss and waste (FLW) in supply chains (Priefer et al., 2016). Such collaborative relationships have the potential to promote unified, supply chain-wide behaviors that support holistic and systemic FLW mitigation strategies. For instance, retailers Sainsbury's and Tesco aligned their FLW strategies and worked with consumers to create the "Buy One Get One Later" promotion to combat overconsumption. Similarly, some retailers are promoting products like jams, spreads, and sauces made from damaged or "ugly" fruits and vegetables or are selling imperfect produce through direct sales channels (Schanes, Dobernig, & Gozet, 2018; Bhattacharya & Fayezi, 2021).

Retailers have taken on new approaches to prevent and reduce food waste, as Huang et al., 2021 states that, some retailers encourage customers to buy food items that are close to their expiration dates by utilizing price reductions in their operations. Other retailers have substituted the packaging to increase the functionality, for example using reusable bags and creating packaging that reduces damage during transportation yet extends the life shelf of products. Patel, 2011, states that retailers implemented measures such training employees, using appropriate technology, temperature management in both stores and warehouses, enhancing forecasting and following up on the food wasted. Many retailers show that training employees is important in minimizing food waste because it helps with correct amounts of orders, rotation of stock and price reductions that are proactive.

Therefore, in answering Sub Question 1, I expect that retailer's attitudes towards the importance of working with other stakeholders and exploring new avenues is likely to increase retailers' motivation to adopt their food waste policy. (*Proposition 1*)

b. Organizational obstacles to retailer's innovation

According to Mohr (1969), organizational barriers to innovation were assessed by evaluating the preparedness of vital lower-level employees within the organization to embrace innovations, particularly regarding their ability to oversee the implementation of new programs. Some of these supervisors had advanced degrees in public health and undergraduate education with significant public health components or had participated in specialized courses offered by government health agencies and local universities. Conversely, others had limited or no specific training in public health, relying mainly on their years of practical experience with conventional programs. Notably, the lack of training among supervisors posed a significant obstacle, primarily when the health officer showed motivation to innovate. Upon dividing the organizations into two comparable groups based on the health officer's motivation for innovation, it was observed that the correlation between the implementation of progressive programs and the training of supervisors was only around 0.15 when motivation was low but nearly 0.40 when motivation was high. This indicates that the absence of training among

supervisors could hinder organizational innovation, especially when there is a solid drive to innovate (Mohr, 1969). Therefore, a higher level of training among supervisor's correlates positively with the adoption of progressive programs. Providing ongoing education and training to lower-level employees, such as staff nurses and sanitarians, can enhance their cooperation and enthusiasm for implementing new initiatives (Mohr, 1969). Various authors within the context of retailers recognize similar obstacles to adoption of food waste reduction initiatives such as employees who need more training on the significance of operational practices for minimizing food waste may be hesitant to participate in these strategies. This reluctance can impede mitigation, underscoring the importance of offering training and retraining opportunities to adopt new techniques and strategies for reducing food waste. (Filimonau & De Coteau, 2019; Sealey & Smith, 2014).

In addition, other obstacles to innovation in the framework of retailers are corporate policies that were recognized as a further hindrance to implementing effective food waste management practices at the store level. Challenges included restrictions on bulk purchasing, limited influence over supplier delivery sizes and frequencies, and the requirement to strictly adhere to internal health, safety, and quality control standards. While acknowledging the importance of compliance with corporate policies, managers expressed a need for greater flexibility on the operational level. This flexibility could empower supermarkets to make more informed decisions to reduce food waste while benefiting employees and local communities (Filimonau & Gherbin, 2017). Also, irresponsible attitudes and a lack of interest expressed by employees in reducing food waste are recognized by managers as an obstacle to adoption of food waste reduction strategies. However, the majority of managers believed that with adequate training on corporate environmental initiatives, food rotation, and handling procedures, these issues would not pose significant obstacles to implementing food waste reduction practices (Filimonau & Gherbin, 2017).

In answering Sub Question 2, I expect that organizational obstacles to retailers such as lack of training among employees impedes the ability of retailers to embrace innovations, their ability to adapt food waste management initiatives. (*Proposition 2*)

c. Retailer's Resources

Based on prior studies, it was expected that the financial resources available to local health departments could elucidate a significant portion of the variation in program innovation across these departments. Nonetheless, it was tentatively assumed that higher income would generally indicate more discretion in allocating resources within local health departments and organizations. For instance, a department with more nurses might find it easier to send them for training in mental health compared to a department with fewer nurses (Mohr, 1969). Within the framework of food waste management practices among retailers many authors have identified that limited resources for creating training programs and assigning skilled individuals to manage digital technology and oversee the transition to digital technologies in food waste prevention impedes the adoption of food waste strategies. This transition necessitates an understanding of existing operations and familiarity with older technologies (Annosi et al., 2021). Additionally, in the distribution sector, surplus food is often repurposed for human consumption or used as animal feed. However, retail stores typically handle excess food by disposing of it as waste and make minimal donations to charities. This is primarily due to the low degree of responsibility and the lack of financial incentives, such as fixed waste disposal fees (Garrone et al., 2014).

Filimonau et al., (2019) also identified the lack of internal resources (such as money, time, and staff) as obstacles to adopting more effective food waste management practices. Furthermore, food waste-reducing platforms (FWRP) have developed as a technological solution in various countries, linking different participants in the food supply chain to minimize waste by redistributing surplus or non-commercial food. However, designing and prototyping an FWRP with various functionalities is complex, expensive, and requires specific expertise that many entrepreneurs lack. Business owners noted that technology is crucial for the viability of their businesses, especially for platforms that sell food surpluses at reduced prices through B2C (business-to-consumer) interactions. These apps need to be functional, user-friendly, and capable of quickly disseminating information from food providers to recipients, particularly since some Brazilians are hesitant to adopt these apps. According to their responses, in a B2B (business-to-business) model, technology facilitates connections along the value chain and enhances traceability, which is vital for commercializing non-standard food. Business owners also highlighted their financial struggles to cover the high costs of developing and adapting these platforms (Freitas et al., 2024).

In answering Sub Question 3, this study anticipates that the availability of resources such as money will increase the innovation of retailers' food waste policies. (*Proposition 3*)

3.Methods of Study

The research explores the factors influencing the successful adoption of food waste management initiatives among retailers in the United Kingdom. This study, which focuses on a specific segment of the food supply chain- the retailers- and builds on the prepositions suggested in the theory section, employed a qualitative research approach using primary research methods. This approach is chosen for its ability to provide an extensive understanding of the factors that influence retailers to adopt food waste reduction policies, drawing on a variety of observations from different interviewees and document analysis (Gerring, 2017). The study used a combination of document analysis and interviews, aiming to enrich the findings and enhance the reliability and validity of the data (Alamri, 2019).

3.1 Data collection

3.1.1. Document analysis

Food retailers' policy documents in the UK were analyzed. This is because these policy documents were readily available, hence, it is less time-consuming. Additionally, they provide comprehensive coverage of food waste management practices among retailers. Eight policy documents were selected using purposive sampling. A purposive sample is chosen based on specific characteristics relevant to the study's objectives (Andrade, 2020). The characteristic for selection is the different market share sizes of the retailers. Within the food retail market, there are 17 supermarkets in the UK; within these, eight retailers were sampled. One retailer with a large market share, two medium-sized market shares, and five smaller market shares. Utilizing these criteria ensured that data collected from different retailers based on their market size provides relevant information about all the retailers in the UK.

Table 1

Documents Analyzed in the study.

Retailers	Documents analyzed	Year of publication	Retailer Size by Market Share (%) (<i>Grocery Market Share - Kantar, 2018</i>)	Market share(By Category)	Level of adoption
A	Corporate responsibility report	2017/2018	5.2	Small	High
B	Retailer B food waste report	2020/2021	2.3	Small	High
C	Food waste initiatives that have been launched-Policy blog	n. d	16.2	Medium	High
D	Initiatives taken to reduce food waste-Policy blog	n. d	5.0	Small	High

E	11 ways retailer E is helping reduce food waste-Policy blog	2016	27.9	Large	High
F	Policy blog-food waste	n. d	15.5	Medium	High
G	Retailer G reveals near zero food waste levels	2018	1.1	Small	High
H	How retailer H is tackling food waste	2018	5.8	Small	High

Table 1 explanations

All the documents in the study were accessed directly from the retailer's websites in June 2024. Retailer's market share is presented as a continuous variable from the website that the researcher accessed (*Grocery Market Share - Kantar, 2018*). For comparison and analysis, the researcher decided to categorize the market share based on each retailer's percentages by grouping each retailer with similar levels of influence in the market. I decided to redistribute the market shares using numerical breakpoints, and since the highest market share shown by the website was 27.9 in 2018, A significant market share starts from 21% to 30%, medium market share, between 11% and 20% and small market share retailers between 1% and 10%.

The column on the level of adopting food waste policies is explained by Mohr's theoretical framework (1969). Retailers who had a high level of adoption of food waste policies are those retailers who are highly motivated to innovate. This is demonstrated by having both a proactive perception of how important it is to work with stakeholders and a proactive viewpoint of introducing non-traditional policies in their operations. With a strong motivation, they overcame obstacles and utilized the available resources.

3.1.2. Interviews

Interviews, with their ability to encourage participants to share more about the phenomenon being studied, significantly enhanced the richness of the data collected. The subjective aspect of interviewing, where interviewees convey their opinions and experiences, allowed the interviewer to gain deeper insights into what the interviewee says (Alamri, 2019). As Connelly and Peltzer (2016) state, qualitative interviews offer a way to collect detailed information from a targeted group of individuals who have encountered the concept being studied.

The primary data was collected through interviews with academic personnel with a relevant background in sustainability, food waste, and retail. Interviews were conducted as part of my research project to support the data collected in document analysis about the factors that influenced the adoption of food waste among retailers in the UK, the interviews that were carried out, received ethical approval from the university of Twente with an ethical approval reference number, 241015. The following experts were contacted.

Interviewee one: Works at the University and has experience in food systems, environmental education and sustainable development.

Interviewee two: Works at the University as an associate professor and has experience in environmental policy planning and policy evaluation.

The academic experts were contacted by emailing their contacts. A message explaining who the researcher is, the research objectives, the reason for contacting them, and how long the interview will last, was informed to the two interviewees by mail. The interviews were conducted online via Microsoft teams. The online interviews were conducted over a period of two weeks and each lasted 40 minutes. All interviews were recorded at the consent of the interviewees, and these were transcribed using the transcription software. The transcriptions enabled subsequent content analysis thus allowing me to systematically categorize the codes. These interview responses from the interviewee's contact, enabled the researcher to collect enriched viewpoints from the interviewee about how motivation to innovate, barriers, and resources influenced the adoption of food waste reduction practices by retailers in the UK. This is because of the flexibility that interviews offered that enabled the researcher to delve deeper into the information behind the responses, the interviews also allowed the interviewees to share their opinions and experiences, giving the researcher a better understanding of the information shared (Alamri, 2019). Also, their response deepened my knowledge on what was discovered from the document analysis. The researcher approached ten informants, and two were interviewed based on the responses received. The interview questions (see Appendix) were based on the conceptual framework of the variables being studied and observed in the research question alongside the expected influence of the facets towards adoption of food waste policies.

3.2 Data Analysis

Content analysis is used to analyze the research question and sub questions, this is because content analysis provides a systematic category-based way of drawing conclusions on the data thus a foundation for the validity of the findings. A code scheme was formulated to structure the data so that it is analyzed logically. Here, deductive and inductive coding were performed. Predetermined codes were formulated based on the conceptualization and theoretical framework presented in the theory section and the inductive codes were formulated directly from the data. Categories were constructed from these codes to identify themes from the data. The themes provided me with a meaningful narrative as a base for the collected data. Below I present the reasoning behind the codes used in the research.

Code scheme

The basis of the code scheme was the theoretical framework presented in the theory section. The three categories: motivation to innovate, obstacles and resources were formulated by combining various codes in Atlas.ti. The first category of motivation to innovate is indicated by having motivations to reduce food waste and this category comprises of codes such as "environmental effects " "target to reduce" and "financial effects". To indicate a strong motivation to innovate the researcher observed the presence of both sustainability approaches which means adopting non-traditional policies and in the context of retailers this means adopting policies that align towards sustainability this is because retailers are private organizations that usually adopt profit making policies so for this case, retailers adopt policies that are align with the wellbeing of the public.

Another behavior to indicate a high motivation to innovate is working with other stakeholders which means being inclined towards activism and by activism the researcher means having an active perception on how it is important to work with other stakeholders to obtain new ideas, support and resources that enable retailers to adopt food waste policies. Both behaviors indicate a high level of motivation while one behavior indicates a low level of motivation to innovate.

The second category ,obstacles is described as barriers to innovation/adoption (Mohr, 1969) .The category of obstacles is comprised of codes such as "impact of COVID 19" "corporate policies" the first code, the impact of COVID 19 is indicated as an obstacle due to changes in the shopping behaviors of customers, hence a reduction in customers coming to stores to take part in price reduction strategies on food nearing its expiration date. Also, this code reflects a challenge in forecasting for some retailers in the UK and as a result the overall food surplus increased. The second code, corporate polices, is described as a barrier due to retailers focusing on the food coming in and out of their stores to maintain profits as their profit margins are small. Retailers do focus on corporate policy of making profits leads to less focus on creative ways to reduce food waste.

The third category is the resources which is described as the availability of means that enable retailers to adopt food waste strategies. The theme is comprised of codes such as trained employees which means trained staff who provide insights on the causes and quality of food waste as stated by retailer E. The second code is food waste programs this is described as redistribution programs that are launched by retailers such as "Feed it Back" and" The Bread and Butter Thing" this is evidenced from retailer D and B, the third code is technology, this is described as packaging technologies that aim to extend the shelf life of the products as described by retailer E and automated software that create efficiencies in operations hence reduction in food waste as stated by retailer G .

Table 2

The policy framework

Category	Code	Frequency of codes	Text example
Motivation to innovate	Motivated by the food waste environmental effects	3	"Did you know that food waste accounts for more global greenhouse gas emissions than aviation? The problem with throwing out food is that all the energy and resources used to produce it are wasted. What’s more, if food rots in landfill, it produces methane,

	<p>Motivated by the target to reduce food waste</p> <p>Motivated by the negative financial effects of food waste</p>	<p>6</p> <p>2</p>	<p>which is a greenhouse gas more potent than carbon dioxide." Retailer A</p> <p>" 50% reduction of food waste in our own operations by 2030"Retailer B</p> <p>" Wasting perfectly good food doesn't just hurt our pockets" Retailer F</p> <p>"The motivation to do this, yeah, again would be motivation as a steered by win, win money. I mean, because what they can still sell for half of the price and don't have to throw away gives them money "Interviewee two</p>
Obstacles	Impact of COVID-19	2	<p>‘‘As a result of the Covid-19 pandemic we saw an increase in the production of food waste. Our sales increased significantly during this period, alongside a huge change in shopping patterns leading to a 27% reduction in the number of customers coming to store, where</p>

	Corporate policies	1	<p>they usually take advantage of price reductions on products nearing their end of shelf life. These factors combined to result in an absolute 20.1% increase in food waste volume during the Covid-19 pandemic”(Retailer B)</p> <p>"Covid lockdowns and supply chain disruption brought significant challenges for forecasting and, as a result, our overall food surplus increased in 2021" (Retailer F).</p> <p>“ If these companies were not super driven by profit motive and thought, well, we can cap our profit at this, and we'll try to deal with these other food waste issues.^[SEP]In a more creative way, slow things down. Connect with stakeholders, see who could use this food.^[SEP]Who could sell it cheaply, you know, or just, you know, sell it and we give it away for free and stuff like</p>
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			that.’’(Interviewee One)
Resources	Food waste program	3	<p>‘‘The Bread and Butter Thing For the second year running, we partnered with The Bread-and-Butter Thing (TBBT) to redistribute surplus food from our online pick center in Hyde, Greater Manchester.’’(Retailer B)</p> <p>‘‘For us, it’s important that this food surplus is redistributed to good causes. That’s why, in 2017, we launched our national food redistribution programme called Feed It Back.^[F]_[SEP]’’ (Retailer D)</p>
	Trained employees	1	<p>‘‘We’ve set up Agricultural Hubs staffed by trained agronomists (agricultural scientists) in Europe, South America and Africa. These act as our eyes and ears on the ground, providing insight into the causes and quantity of food being wasted. (Retailer E).</p>

	Technology	2	<p>“We are also working on a range of packaging technologies with the aim of extending product shelf life by up to two days.” (Retailer E)</p>
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3.1.3 Triangulation and Multi-method analysis

The significance of the research findings was highlighted through triangulation. By making the audience aware of the importance of the study and the concept of triangulation, in enhancing the reliability and validity of this research. This method helps to minimize the influence of potential biases present in a single method (Bowen, 2009). The primary data consists of existing food retailers' policy documents found on their websites and the data collected from interviews with academic personnels that share information about food waste and how these factors influenced retailers in the UK to adopt food waste reduction policies.

4. Findings

4.1 Comparison of retailers based on food waste policy adoption

The findings analyze the relation between the main categories from the coding process with the adoption of food waste policies by retailers to allow for large scale analysis. This enables the researcher to identify the relationships and variations in the results. By analyzing and comparing these categories in relation to adoption of food waste policies by retailers the study presents which factors successfully influence retailers in the UK to adopt food waste policies compared to the other factors.

4.1.1 Motivation to innovate

How does retailer's motivation to innovate influence successful adoption of food waste management practices?

Given that the research sampled eight retailers, I decided to utilize two features of motivation to innovate: High level of motivation to innovate and low level of motivation to innovate. The data presented below shows that all the eight retailers in this sample have a high level of motivation to adopt food waste policies, and this is indicated by their perception on how important it is to actively collaborate with external stakeholders to obtain ideas, support and resources that encourages them to adopt food waste reducing practices and the retailer exploring sustainability approaches.

Three out of eight retailers were motivated by the environmental challenges caused by food waste and that is why these retailers have worked with external stakeholders such as food donation apps, local charities and suppliers to seek resources and ideas in order to adopt food waste policies and have explored sustainability approaches to reduce food waste. Retailer F mentioned that "We have a target to reduce food waste by 25% by 2025 and 50% by 2030. Wasting perfectly good food doesn't just hurt our pockets, it's also a major cause of climate change" "Since 2013, Retailer F has been working with FareShare to donate surplus food caused by over-supply, damages or short-date codes directly from our chilled depots" and "When we have bread that is too stale to be donated to charity we send it to be used for animal feed. In 2021, 1071 tonnes of bread was sent for animal feed, +39% vs 2020" (Both behaviors of a strong motivation are demonstrated). Text example from Retailer F.

Retailer A states, "Did you know that food waste accounts for more global greenhouse gas emissions than aviation? The problem with throwing out food is that all the energy and resources used to produce it are wasted. What's more, if food rots in landfill, it produces methane, which is a greenhouse gas more potent than carbon dioxide. That's why tackling this problem has been one of our priorities." "We have been donating food at a local level for many years. In 2017, Retailer A redistributed over £2.1 million worth of stock to local charities and good causes. We also started working with Fare Share, Food Cloud, and we have donated the equivalent of over 48,000 meals to those in need" and "Any remaining food and other organic matter waste (including horticultural waste and coffee grinds) is sent to generate energy through anaerobic digestion. We reduced this waste stream by 17.5% this year through better waste management practices." (Both behaviors of a strong motivation are demonstrated) and text examples from retailer G state " Our goal is to be the most environmentally friendly supermarket as such, minimizing food waste is a key part of their long-term strategy." "Retailer G works with 17 Food Partners; food banks, charities, organizations and animal parks" " to redistribute

food to individuals and families in need" and " "Our business model is built around efficiency and low waste. By continually improving our technology, processes, and our relationships with suppliers, we've been able to reduce our food waste to practically zero"(Both behaviors of a strong motivation are demonstrated). (policy documents read on 24, June 2024).

Six out of eight retailers were motivated by the target to reduce food waste to 20% by 2025 and 50% by 2030. By having this motivation, six retailers (Retailer A, B,C,D,F,G) actively seek external interactions to obtain resources that enable and influence them to adopt food waste policies. Text examples by some of the retailers on how this motivation influences the retailers to adopt food waste reduction policies are , Retailer B mentions that " 50% reduction of food waste in our own operations by 2030" " We continue to work with suppliers across our supply chain to develop new packaging, transportation and storage approaches to keep products safer and fresher for longer. To avoid waste, we are also improving our forecasting and ordering system. "Retailer C mentions that " Our commitment ; Reduce food waste by 50 per cent by 2030 " "In 1998, we launched our Food Donation Programme, where stores partner with local organizations operating both Front of Store (customers donations into donation points in stores) and Back of Store (donating surplus stock to local organizations) programmes" and " we're working to reduce or put as much of our waste as possible to good use" (policy documents read on 24, June 2024).

One out of eight retailers were motivated by the negative financial effects of food waste on their operations as a motivation to reduce food waste. Retailer F mentioned that " Wasting perfectly good food doesn't just hurt our pockets' and that they seek out external interactions as illustrated in the text example mentioned earlier. It is observed that two out of eight retailers did not mention any motivations that influence their adoption of food waste policies, but the two retailers do demonstrate the mentioned behaviors that indication a high level of motivation to adopt food waste policies. Text example " Last year we launched a programme in partnership with FareShare FoodCloud which links retailer E to stores to local charities and community groups allowing us to redistribute surplus food that's left over at the end of the day and ensure it's not wasted." We're now following through on our commitment to roll out the scheme nationally under the name Community Food Connection" " Our target is to have rolled Community Food Connection out to all large Tesco stores – numbering over 800 – by the end of 2016, with all stores covered by the end of 2017" Text examples from retailer E. (policy document read on 24, June 2024). " Donating surplus food from our depots to those in need with Fare Share" As of April 2018, we are now matching local causes with retailer H Food stores to redistribute unsold food through our Food Share programme and "managing our stock to try to make sure we don't have too much " Text example from retailer H. (Policy document read on 24, June 2024).

The findings from Interviewee one do not support the hypothesis that the retailer's attitudes towards the importance of working with other stakeholders and exploring sustainability approaches is likely to increase their motivation to adopt food waste policies .Interviewee one mentions that while retailers may want to appear socially and environmentally responsible their main motivation is making profits which leads them to treat food waste as another financial concern rather than a sustainability issue which means that a motivation to make a profit did not lead them to make external interactions and explore sustainability approaches but rather to fill

shelves, satisfy customers and gain profits. Text examples from Interviewee 1 " Their main motivation is profit, so for them. They need to move food onto their shelves as fast as possible. Never have an empty shelf. That is the cardinal sin of retail. If you see as a consumer, a store with an empty shelf, they're already they have lost. You know that that is not get OK so." and " So I think this is the main motivation for retailers. It is not about. You know, to some extent, yes. We don't want to look bad at consumers. We want to keep their trust to say that we're doing something for the environment or doing something for, climate. But for the most part, the bottom line for them has always been profit making." , " But the food waste for them is just another kind of line item on their ultimate spreadsheet.' (Interview given on July 4, 2024).

Interviewee two mentions a similar motivation as interviewee one by stating that retailers in the UK were motivated by a financial gain which led them to adopt food waste policies such as automatic product labelling so as identify products nearing their expiration dates and placement of food items near expiration dates in visible areas to encourage customers to buy them and they still gain profits. However, this person differs from the interviewee one by illustrating that this motivation influences retailers UK to adopt food waste policies. Text examples include " If you if you talk about innovation, you have to mostly think about three things, labelling of products, how you do this. Automatically work with product labelling in a way that you could more easily filter out products that nearly overdate and do something with that, and the third innovative part would be how you place products in the supermarket " and " the motivation to do this, yeah, again would be motivation as a steered by win, win money. I mean, because what they can still sell for half of the price and don't have to throw away gives them money " (Interview given on July 6, 2024) . Another motivation mentioned by interviewee two is the social objective, retailers adopt price reductions on food items nearing their expirations dates so as to support customers that can only afford to buy such items at a reduced price. Text example states " I mean you see then in the you see in the shop that they're trying to do the best not to throw it away, but try to at the last moment for it to sell the food for a for a lower price until people would take it might also be a social objective for the company and then it would be that they would do this because they want to support some customers that cannot buy certain foods that would only be able to do that at the last moment." (Interview given on July 6, 2024).

4.1.2 Obstacles

How do organizational obstacles to retailers influence successful adoption of food waste management practices?

Under the category of obstacles, I compared two features: the presence and absence of obstacles among retailers influences the adoption of food waste policies. The results from the coding of documents show that two out of eight retailers faced COVID-19, which hindered their ability to adopt price reductions on food items near expiration dates and accurate forecasting strategies, respectively, that could reduce food waste in their stores. "As a result of the Covid-19 pandemic, we saw an increase in the production of food waste. Our sales increased significantly during this period, alongside a huge change in shopping patterns leading to a 27% reduction in the number of customers coming to the store, where they usually take advantage of price reductions on products nearing their end of shelf life. These factors combined resulted in an absolute 20.1% increase in food waste volume during the COVID-19 pandemic " Text example from Retailer B (policy document read on June 25, 2024).

The above statement means COVID-19 hindered the retailer from adopting price reductions on products closer to their expiration date. Text example from retailer F " Covid lockdowns and supply chain disruption brought significant challenges for forecasting and, as a result, our overall food surplus increased. (policy document read on June 24, 2024). The statement means that the existing forecasting methods needed to be revised in forecasting demand due to COVID-19; hence, retailer F faced hindrances in adopting accurate forecasting policies because of the disruptions in consumer demand. In contrast, six out of eight are observed to have no obstacles impeding the adoption of food waste reduction policies in their operations.

Results from Interviewee one does not confirm the hypothesis that organizational obstacles such as lack of trained employees impede the ability of retailers to adopt food waste policies. This person mentions that corporate policies focused on making profits led to a fast movement of food products in the supply chain to satisfy customers and achieve profit margins without slowing down to focus on reducing food waste. " But I think these are all corporate decisions. I mean these are all about the way in which they want to make profit " If these companies were not super driven by profit motive and thought, well, we can cap our profit at this, and we'll try to deal with these other food waste issues. In a more creative way, slow things down. Connect with stakeholders, see who could use this food" Text example from Interviewee One (Interview given on July 4, 2024).

In conclusion, only two out of eight retailers mentioned to have faced one obstacle impeding their ability to adopt two food waste policies, namely accurate forecasting strategies and placing discounts on food items closer to their expiration dates; the other six retailers from the sample did not mention having obstacles that hindered the adoption of food waste initiatives hence two policies were not adopted by retailer B and F respectively due to the impact of covid 19 compared to adoption of various policies such as printing of storage instructions on loose and packaged fruit and vegetables by retailer H, commitments to reducing food waste and donating to local charities by retailers A, C, E, D, G, H because of the absence of obstacles. However, interview responses show that these retailers in the UK faced an obstacle of corporate policies, and this led to a low level of adoption of food waste reduction policies. This contrast between the document analysis and interview responses is significant in understanding the different perspectives on the obstacles faced by retailers. Retailers might be selective in portraying the ease of adopting food waste strategies without considering corporate policies such as making profits as an obstacle, yet the academic expert has based their responses on their experiences and research, which portrays real-world obstacles; hence, interview responses have provided the researcher with an understanding of obstacles that hindered the adoption of food waste policies by all the retailers.

4.1.3 Resources

How do retailers' resources influence successful adoption of food waste management practices?

The researcher chose to study this category by comparing two features under resources: the availability and unavailability of resources among retailers influence the adoption of food waste policies. Three out of eight retailers showed that the availability of food waste programs increased their ability to adopt the redistribution of food surplus. "The Bread and Butter Thing For the second year running, we partnered with The Bread and Butter Thing (TBBT) to redistribute surplus food from our online pick center in Hyde, Greater Manchester."

(Text examples from Retailer B)" For us, it's important that this food surplus is redistributed to good causes. That is why in 2017 we launched our national food redistribution programme called Feed It Back. Text example from Retailer D "Since then, we have expanded our charity donation program to include our home offices, ambient depots, and since 2020, all stores have been able to donate surplus through Fare Share Text example from Retailer F. (Policy documents read on 24 June 2024).

Two out of eight retailers showed that the availability of technology has led to an increase in the adoption of food waste policies. The availability of technology has led to an increase in the adoption of food waste policies such as packaging technologies that increased the adoption of a policy that extends product life shelf among retailer E and the adoption of efficient operations that lead to less food waste due to technology such as automation software as part of retailers G's strategies. "We are also working on a range of packaging technologies with the aim of extending product shelf life by up to two days." (Text example from retailer E) "Retailer G's three Customer Fulfillment Centers (CFCs) are highly automated hotbeds of technology, which the retailer has developed internally over the past 18 years. Using technology such as automation, robotics and proprietary software, the retailer has created a slick operation with efficiency at its heart. Consequently, less than 0.02% of food items are wasted, or 1 in 6,000 food products" (Text example from retailer G). (Policy documents read on 24 June 2024).

One out of eight retailers demonstrated that the availability of trained employees increased the adoption of food waste policies. Retailer E, with a large market share, has set up agricultural hubs that provide insights on the causes and quantity of food being wasted with the availability of trained agronomists; "We've set up Agricultural Hubs staffed by trained agronomists (agricultural scientists) in Europe, South America and Africa. These act as our eyes and ears on the ground, providing insight into the causes and quantity of food being wasted. Recently, our African Hub flagged our specification for fine beans as causing unnecessary waste on farms in Kenya. So, we widened our specification and stopped trimming the beans. As a result, on average 15% more of the crop is now being used rather than going to waste" (Text example from retailer E. (Policy documents read on 24 June,2024).

With the above findings, the researcher can find an increasing adoption of food waste policies due to resource availability among five out eight retailers compared to a decrease in food waste policy adoption among two retailers (A and H) who did not show resource availability in their policy documents hence no actual adoption of policies was observed in relation to resources.

4.1.4 Additional observations

Table 3

Summary of policies adopted by retailers in the UK

Retailers	Policies Adopted
Retailer A	<ul style="list-style-type: none"> Commitment to food waste reduction roadmap.

	<ul style="list-style-type: none"> • Partnership with Fare share and Olio food waste heroes. • Purchasing whole meat from livestock. • Support food waste action week. • Identify areas where food is wasted.
Retailer B	<ul style="list-style-type: none"> • Signatories to the Courtauld Commitment 2030 to reduce food waste • Signatory to the WRAP/IGD Food Waste Roadmap • Sent food waste to anaerobic digestion • Collaborate with suppliers to enhance forecasting improvement • 50% percent discount • Donation of surplus food • Successful launch of food waste reduction programs
Retailer C	<ul style="list-style-type: none"> • Work with suppliers • Launched food donation program • Update product labelling • Working with WRAP
Retailer D	<ul style="list-style-type: none"> • Collaboration with WRAP • Food waste program to identify surplus food • Redistribution of surplus food
Retailer E	<ul style="list-style-type: none"> • Collaboration with Fareshare, Food cloud • International food donations • Reporting food waste data • Processing food to avoid waste • Paying attention to specialists • Working with suppliers on forecasting • Food donations made by suppliers • Advancing technology to keep food fresh • Adopting promotions on food • Seeking innovative solutions • Collaborating globally
Retailer F	<ul style="list-style-type: none"> • Reducing food waste at household • Reducing food waste in operations • Working with suppliers and food waste programs to donate • Redistribution

Retailer G	<ul style="list-style-type: none"> • Repurpose • Work with suppliers • Helping customers reduce food waste • Increased shelf life of food items for one day • Fewer storage location • Controlled supply chain • Improved software to reduce waste • Adopted packaging solutions • Redistribution • Work with WRAP
Retailer H	<ul style="list-style-type: none"> • Donating food surplus • Managing food to avoid waste • Turning what remains into green energy • Reducing prices to food near expiration dates • Helping to reduce food waste at home

Source: Retailer's websites

5. Discussion

5.1 Interpretations of the results

Motivation to innovate

How does retailer's motivation to innovate influence successful adoption of food waste management practices?

The findings from policy documents confirm that retailers' attitudes towards working with other stakeholders and exploring new avenues will likely increase their motivation to adopt their food waste policy. All eight retailers in the sample have a high level of motivation to innovate to adopt food waste policies. This is because retailers demonstrated that they seek external collaborations to obtain support that enables retailers to adopt food donations of their surplus food and explore sustainability approaches. Six retailers out of eight (A, B, E, F, G, and H) have adopted more policies than Retailers D and C. Five policies by Retailer A, seven policies by Retailer B, five policies by Retailer F, and nine policies by Retailer G. Retailer E with a significant market share, adopting eleven policies in 2016. The number of policies adopted by the retailers is between five to eleven. Four out of the six retailers mentioned above are motivated by the environmental effects of food waste on the climate and their goals to reduce food waste to specific percentages. That is why the retailers have worked with Fareshare, and food banks; these stakeholders have provided support to retailers by redistributing surplus food to local charities and community groups, while two out of six retailers (E and H) who have demonstrated adopting eleven and six policies respectively, do not mention any motivations.

Four out of five retailers with a small market share (A, B, G, and H) with environmental and goal motivations have adopted have demonstrated both behaviors of having a strong motivation to innovate (working with other stakeholders and exploring sustainability approaches) and have also adopted more policies with a positive impact in reducing food waste than retailer C with a medium market share who demonstrated both behaviors but adopted less policies (four policies). Retailer A, with a small market share, distributed surplus through the Fareshare distribution network in 2017 and has donated 16 million meals up to date, hence saving over 7000 tonnes of food, retailer B with a small market share, sent 9555 tonnes of food waste to anaerobic digestion in 2020/2021 which turns food waste into energy.

However, one retailer out of eight (retailer F) with a medium market share has similar motivations and adopted more policies (Six). One of the policies had a positive impact on reducing food waste; the retailer redistributed surplus food with over 27.3 million meals through fare share between 2013 and 2021. One retailer with a significant market share has adopted eleven policies so far by 2016 and did mention that in 2015, the retailer introduced a food donation program in 14 stores and saved 22 tonnes of food, which is 55,000 meals for local charities a policy that had a positive impact on food waste reduction.

The above discussion means all eight retailers have a high adoption of food waste policies due to their motivation to innovate. However, some retailers are adopting more policies than others, and some have created a positive impact in reducing food waste. Some retailers with a small market share are adopting more policies with positive impacts than some retailers with a medium market share.

The interview findings do not support the hypothesis that retailer's attitudes towards the importance of working with stakeholders are likely to increase their motivations to adopt food waste policies; however, the findings from interviewee two show how having motivations to innovate influences retailers in the UK to adopt food

waste policies and interviewee one shows that mainly one motivation (the drive to a make a profit) that retailers have, does not influence them to adopt food waste policies. Moreover, other motivations, such as environmental and social concerns, are not strong enough. In other words, collaborations with external stakeholders and exploring sustainability approaches do not increase a retailer's motivation to adopt food waste policies. This means that even though policy documents and findings from interviewee two illustrate that retailers in the UK have strong motivations that are influencing them to adopt food waste policies, responses from an academic expert whose research has focused on retail and food waste is interpreted as retailers in the UK do not have strong environmental and social motivations, and this leads to adopting less food waste policies which has had less impact in reducing food waste.

Obstacles

How do organizational obstacles to retailers influence successful adoption of food waste management practices?

The hypothesis proposed that organizational obstacles to retailers, such as lack of training among employees, impede the ability of retailers to embrace innovations; the findings do not confirm the assumption. This is because different obstacles have impeded the ability of retailers to adopt food waste policies; one obstacle, corporate policies, was mentioned by interviewee one. Two out of eight retailers (B, a small store, and F, a medium store) identified covid 19 as the obstacle that impeded the retailers from discounting products nearing their shelf life and better forecasting strategies respectively; however, even with this obstacle, retailer B has a high level of adopting food waste policies as mentioned seven other policies have been adopted. This is because only one policy was not adopted during the COVID–19 lockdowns between 2020 and 2021. However, the retailer indicated working with suppliers in the redistribution of surplus food, committing to the WRAP/ IGD food waste roadmap, and taking various sustainability policies to reduce food waste, such as applying 50% discount on fresh foods such as vegetables, bread, milk that were nearing their expiration dates and turning food waste into energy by sending the waste to anaerobic digestion for the rest of the period under study hence retailer B maintained a high level of adopting waste strategies despite the challenge.

Retailer F has a high level of adoption of food waste policies. This is because only one obstacle hindered better forecasting, but the retailer adopted six other policies during the period under study. Even though the impact of COVID-19 hindered the adoption of two policies by two retailers out of eight, the retailers adopted many other policies to reduce food waste, for example, policies concerned with repurposing and redistribution of food waste, reducing food waste among consumers and suppliers. Although the rest of the six retailers, especially those with a small market share, did not acknowledge facing obstacles, interviews with academic experts revealed that these retailers face hindrances such as corporate policies to make profits. This impedes their ability to adopt food waste policies because retailers in the UK focus on filling their shelves and satisfying customers rather than adopting more food waste policies than what is being done. Despite the internal challenges that are not acknowledged publicly, there is a high level of adoption of food waste policies among all eight retailers, as observed in having a high motivation to innovate with these retailers adopting more food waste policies.

In conclusion, obstacles can hinder food waste policy innovation, but their impact varies depending on the retailer's motivation to innovate and available resources. Retailer B, with a small market share, faces one obstacle but still innovates food waste policy highly because of its high motivation to innovate, adopting seven policies with one policy having a positive impact in reducing food waste, like retailer F, with a medium market share. However, all eight retailers are faced with corporate policies that drive them to focus on making profits; thus, less food waste policies of limited impact were adopted by all these retailers.

Resources

How do retailers' resources influence successful adoption of food waste management practices?

The findings do not confirm the hypothesis that the availability of resources such as money will increase the innovation of retailers' food waste policies. Diverse resources are mentioned to have influenced retailers to adopt food waste policies. The availability of resources among five retailers, B, D, E, F, and G, of the eight that were sampled shows an active adoption of food waste policies. —the availability of food waste programs, trained employees, and technology. Retailers B and D, with a small market and F, showed that the availability of food waste programs such as The Bread-and-Butter Thing for Retailer B and Feed it Back for Retailer D have enabled the donation of food surplus to local charities and families in need. Similarly, retailer F, with a medium market share, has utilized the charity donation program that enabled the retailer to work with Fareshare to donate surplus food to local charities in the UK. On the other hand, retailer A, with a small market share, presented no resources but adopted similar policies of donating and redistributing food surplus, reducing food waste through the Fareshare redistribution network thus resources play an aiding role to the first factor a motivation to innovate Retailer E, with a significant market share, has utilized technology and trained employees, which has enabled the retailer to adopt packaging technologies that extend product shelf life, redistribute surplus food, and gather information on the causes and intensity of food waste in their operations. Similarly, retailer G has utilized automation and robotic software that creates efficiency in operations; hence, less food is wasted. Although five out of eight retailers indicated the presence of resources that increased their ability to adopt food waste policies, two remaining retailers, A and H, with a small market share, did not indicate any resources but still showed a high level of adopting food waste policies due to a strong motivation that influenced them to adopt similar policies like donation of food surplus, turning food waste into energy, working with supplies to manage their stock. Resources are an essential factor in influencing the adoption of food waste management policies, but only with the presence of a motivation to innovate, which enables the utilization of these resources.

In conclusion, motivation to innovate is seen as the most important factor that influenced food waste adoption; this is because when retailers have motivations to innovate their food waste policies, they seek external interactions to obtain ideas and support that enable the retailers to adopt food waste policies as well as taking on sustainability approaches that reduce food waste without any legal mandate. At the same time, resources and obstacles play an aiding role. This has led to the conclusion that all eight retailers in the sample had a high level of adoption of food waste policies because of strong motivations. However, fewer obstacles were mentioned to impede the ability to adopt food waste policies. Nevertheless, one interviewee mentioned that the drive to make a profit impeded the retailers' ability to adopt more policies; thus, there were less food waste policies adopted by retailers in the UK. Even though no retailers are observed to have a low level of adopting food waste policies,

this study states that retailers with a low level of adopting food waste policies ,have a low level of motivation by demonstrating one behavior either seeking external interactions or taking on sustainability approaches and are impeded by organizational obstacles even with available resources.

5.2 Discussion of Implications and Limitations

The findings from the data collected contribute to a clear understanding of Lawrence Mohr's theory on the determinants of innovation in organizations published in 1969, in the context of retailers' adoption of food waste policies in the UK. These findings suggest that retailers in the UK who demonstrate a proactive perception of engaging with stakeholders and taking on sustainability approaches adopt food waste policies. This aligns with Mohr's concept of health officers' activism and ideology, where proactive engagement with external stakeholders and proactive viewpoints on introducing a range of non-traditional services facilitate innovative programs. The theory by Mohr presented obstacles such as a lack of trained vital employees in the context of local health departments that impede the ability to adopt policies. In contrast, the results from this study revealed different obstacles, such as a drive to make a profit and the impact of covid 19, that influenced retailers in the UK to adopt a few food waste strategies.

Also, the existing research by Filimonau and Gherbin, 2017 mentions that corporate policies such as restrictions on bulk purchasing, limited influence over supplier delivery sizes and frequencies, and the requirement to strictly adhere to internal health, safety, and quality control standards impeded the ability of store managers to adopt food waste policies and research by Filimonau and De Coteau, 2019 which mentions lack of trained employees on the significance of operational practices for minimizing food waste may be hesitant to participate in adopting food waste policies as obstacles to retailers, differs from the obstacles demonstrated in the results, the findings observed that the impact of COVID-19 and the drive to make a profit were the obstacles that impeded the ability of retailers in the UK to adopt more food waste policies. While the previous research by Mohr,1969 focused on money as a resource in the context of local health departments that enabled health departments to allocate resources that led to adopting new programs, the results differ from the theory and do demonstrate that different resources, such as trained employees, technology and food waste programs, increase the possibility of successfully adopting food waste strategies by UK retailers.

For policy implications, since there is a voluntary commitment by retailers in the UK to prevent and reduce food waste in the UK and there is no legal mandate from the government, the findings of this research have shown that there is no necessity for a legal obligation from retailers. However, policymakers should utilize other approaches to sustain this voluntarism. Policymakers in the UK should consider offering incentives such as grants or support programs in ways that food waste prevention and reduction is not a burden to the retailers, especially retailers with a small market share to sustain their innovative efforts towards food waste prevention and reduction; additionally, policymakers could consider implementing policies that solve obstacles faced by retailers in the UK, for example, the drive to make a profit could be solved by providing incentives that allow retailers to have reduced expenses hence can innovate policies without losing their profitability and also implementing continuous awareness campaigns about the environmental and economic benefits of food waste reduction.

The generality of these results is limited by the fact that the researcher was unable to interview the employees of the retailers in the UK; hence, the findings are limited to a few obstacles where six out of eight retailers did not mention obstacles in their policy documents if interviews were to be conducted with employees of these retailers then the researcher could have delved deeper into the obstacles faced ,that impede their ability to adopt food waste policies so as to provide more evidence on why interviewee one states that retailer's adopted less food waste policies due to the retailers focus on profit making. However, the results are valid because the researcher accessed retailer policy documents and viewpoints of academic experts in food waste and retail. Additional studies could expand on the findings in this study by exploring the obstacles faced by retailers in adopting food waste policies hence why there is still limited impact of the policies that have been adopted so far and by answering a research question on why retailers in the UK demonstrate high voluntarism in adopting food waste policies even though food waste policies involve investing money, which is burdensome to them.

6. Conclusion

The main research question for this research was "*What factors influenced the successful adoption of food waste management practices among retailers in the United Kingdom between 2015 and 2021?*" I find that motivation to innovate is the most important factor in influencing retailers in the UK to adopt food waste policies successfully; most of the retailers were motivated by the environmental effects of food waste and their targets to reduce food waste, hence demonstrated a high level of adopting many food waste policies due to a strong motivation to innovate which is seen through a willingness to engage with other stakeholders and exploring sustainability approaches to reduce food waste. Text examples from the retailers highlighted their efforts in working with Fareshare and Food Cloud in donating to local charities, partnering with organizations, such as WRAP and IGD food waste roadmap, converting wasted food into animal feed and energy, and applying 50% discounts on fresh products on their last day of life to reduce food waste.

Secondly, resources are another factor that influenced retailers to adopt food waste policies successfully. Five out of eight retailers in the sample had access to food waste programs, technology, and trained employees. These resources increased the adoption of food waste policies, such as food redistribution programs, utilizing technology to extend product shelf life, and employing agronomists to reduce waste at the source. Lastly, obstacles are another factor that hindered retailers in the UK from adopting food waste policies. COVID-19 and the drive to make a profit are obstacles that hindered retailers from adopting more food waste policies. Obstacles and resources play an aiding role to motivation to innovate, with a motivation to innovate retailers can utilize their resources to overcome obstacles and successfully adopt food waste policies.

The study utilized a qualitative research approach, incorporating primary research methods. This approach was selected for its capacity to offer a comprehensive and in-depth understanding of the factors influencing retailers to adopt food waste reduction policies. This method ensures a rich and nuanced exploration of the subject matter by gathering diverse observations from two interviewees and conducting a thorough document analysis. The qualitative approach allowed for the capture of complex, context-specific insights, hence facilitating a deeper understanding of the motivation to innovate, challenges, and resources involved in retailers' food waste management efforts. The research was based on the understanding of Lawrence Mohr's theory on the determinants of innovation in organizations, which is discussed in the theoretical section. The findings confirmed the proposition that working with stakeholders and taking on sustainability approaches is likely to increase retailer's innovation, but the other two hypotheses on how organizational obstacles, such as untrained employees, impede the ability of retailers to adopt food waste policies and resources such as money increase the ability to adopt food waste policies were not confirmed by the findings. This study has contributed to understanding what factors influenced food retailers in the United Kingdom to adopt food waste management practices between 2015 and 2021 successfully and how these factors influenced this adoption. Finally, a policy brief is written to offer recommendations informing policy decisions on how the factors examined in this study (motivation to innovate, obstacles, and resources) can be leveraged to influence retailers to adopt food waste management practices.

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8. Appendix

8.1 List of Abbreviations

COVID-19 – Coronavirus Disease 2019

FAO-Food and Agricultural Organization

IGD - Institute of Grocery Distribution

UK- United Kingdom

WRAP -Waste and Resources Action Program

8.2 Sub Questions and propositions

Sub Questions	Propositions
SQ1. How does retailer’s motivation to innovate influence successful adoption of food waste management practices?	Proposition 1. The thesis expects that taking on new avenues and working with stakeholders is likely to increase retailer’s motivation to innovate their food waste policy.
SQ2. How do organizational obstacles to retailers influence successful adoption of food waste management practices?	Proposition 2. The thesis expects that organizational obstacles to retailers such as lack of training among employees impedes the ability of retailers to embrace innovations mainly their ability to adapt food waste management initiatives
SQ3. How do retailer's, resources influence successful adoption of food waste management practices?	Proposition 3. This study anticipates that the availability of resources will increase the innovation of retailer's food waste policies

8.3 Interview questions

1. How does the motivation to innovate influence retailers to adopt food waste management policies?

Follow up: Can you elaborate on how taking on new avenues and working with stakeholders motivate them to adopt food waste management policies?

2. How do organizational obstacles to retailers impede the ability of retailers to innovate food waste policies?

Follow up: Can you elaborate on how the lack of employee training impedes retailers' ability to embrace the adoption of food waste control measures?

Follow up: How do corporate policies, such as restrictions on bulk purchasing impede retailers' ability to embrace the adoption of food waste control measures?

Follow up: How do strict internal health, safety, and quality control standards impact the adoption of food waste reduction strategies?

Follow up: How does irresponsible attitude among operational employees impede retailers' ability to adopt food waste policies?

3. How does the availability of resources increase retailers' adoption of food waste policies?

4. How does the size of a retail organization influence its approach to adopting food waste management policies?

Follow up: Do larger retailers face different challenges or advantages compared to smaller retailers?

8.4 Policy Brief

Addressing food waste among retailers in the UK: A Deliberate Approach to Sustainability

Background information

Three significant WRAP studies conducted in 2013 and 2016 estimated that the UK generates approximately 10 million tonnes of food waste annually across households, the hospitality sector, food manufacturing, retail, and wholesale industries. Of this, 60% was deemed avoidable. The economic value of this wasted food exceeds £17 billion per year, and its environmental effect is linked to about 20 million tonnes of greenhouse gas (GHG) emissions (WRAP,2017). Retailers are responsible for less than 3% of the UK's total food waste, according to WRAP (2017). Although retailers make a low contribution to food waste, they hold a crucial position within the supply chain. Retailers can scale down on food waste by joining forces with suppliers and influencing buyer's actions (Young et al.,2017).

Causes of food waste in retail

As mentioned by Mena et al. (2014), causes of food waste in retail regarding fruits, vegetables, and meat include temperature control during transportation and storage, in-store management (both in display and storage areas), inventory control (inaccurate stock records can lead to over-ordering), shelf-life management, improper handling by staff and customers, slow sales rates, seasonal demand variations, limited access to retailer information, inconsistent ordering patterns.

Effects of food waste and why it matters

When food is wasted, it's not only the food that goes to waste but also the resources and endeavor used in cultivating, processing and transportation is lost. For example, fertile land, fresh water, fertilizers and energy. Additionally, environmental issues result from food waste such as greenhouse gas emissions. Therefore, beyond concerns about food abundance, wastage of food has significant environmental impacts because of the draining of these interconnected resources (Kummu et al., 2012; FAO, 2019).

Reasons for writing the policy recommendations

This policy brief examines the current external impacts of food waste and explores ways to solve these externalities by positioning retailers as critical actors in addressing the issue. While the retail sector is not the largest source of food waste, it has significant potential to influence waste reduction across the entire supply chain (WRAP, 2017; Young et al., 2017) and reduce food waste in its operations.

Policy recommendations based on the findings in the study

Results from this research indicate that retailers show the willingness to collaborate with other stakeholders and do actively engage in adopting innovative initiatives, such as a 50% discount on food that is nearing their expiration date, as mentioned by retailer B, policy decisions should focus on sustaining retailers to continue the innovate efforts of addressing food waste and overcoming obstacles such as the drive to make a profit.

Solving the obstacles: The obstacles such as corporate policies focused on making profits can be addressed through tax reductions to reduce retailers' business expenses to allow retailers to adopt food waste management practices such as technologies that reduce food waste without retailers giving up their profitability.

Resource availability: The availability of resources supports and enhances the motivation to adopt food waste management practices. For Instance, policy decisions should be based on availing such resources as knowledge by offering access to experts whom retailers can consult on food waste management, and offering workshops and training linked to the specific needs of different retailers.

Additionally, policy decisions should support research and development of new technology that assists retailers in addressing food waste, such as mobile apps to engage customers by offering discounts or rewards for purchasing soon-to-expire products, demand forecasting software that integrates sales data to provide better demand forecasting, ensuring that retailers only order what they can sell and also policy decisions should encourage the use of technology which will encourage collaboration between retailers and suppliers, this will lead to improvements in just-in-time deliveries hence reducing over stocking of perishable products. Lastly, technology can be utilized in the form of customer loyalty programs through customer engagement technology that rewards customers that send their excess food to food charities through redistribution programs. This will influence customers to prevent and reduce the food from going to waste.