UNIVERSITY OF HULL

CRITICAL EVALUATION OF THE IMPACT OF MULTI-STAKEHOLDERS' PRACTICES ON FOOD WASTE MANAGEMENT IN THE GARKI DISTRICTS OF ABUJA, NIGERIA– A QUALITATIVE STUDY

being a thesis submitted in partial fulfilment of the

requirements for the degree of

Doctor of Philosophy in Marketing

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by

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Declaration

This is Victor Oyewumi Ogunbiyi, I confirm the research paper entitled "Critical evaluation of the impact of multi-stakeholders' practices on food waste management in the Garki Districts of Abuja, Nigeria– a qualitative study" is submitted to achieve the Award of Doctor of Philosophy in Marketing at University of Hull Business School, is my original work.

Place: University of Hull, Hull, United Kingdom

Date: 08/12/2022

Signature of the Supervisor

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Signature of the student

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Dedication

With love and admiration, I dedicate this thesis to my parents for their enormous support in completing my studies. A special thanks to my true love, Bose Comfort Ogunbiyi, for her unimaginable love and support throughout my PhD journey and for assisting me with stress management, as well as to my children, Praise Eniola Ogunbiyi, Daniel Eniayo Ogunbiyi, and Richard Eniope Ogunbiyi, for their patience and understanding when I could not give them as much attention as they would like. My wife and my children were at times denied some basic fatherly care, but they never 'crucified' me for that. Instead, they showed me the greatest understanding and support that man has ever known. I love my family and will never forget the sacrifices they made and how immensely they supported me. To the memory of my late mother-in-law, who died 12 years ago, a few weeks after my master's graduation ceremony, she was supportive of my career aspiration. Although she is late, I still love her dearly and will never forget the affection she showed me during her life-time.

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Abstract

Critical Evaluation of the impact of Multi-stakeholders' Practices on Food Waste Management in the Garki districts of Abuja, Nigeria: A Qualitative Study

Victor Oyewumi Ogunbiyi

This research focuses on the main causes of food waste and strategic approaches that can be applied in reducing food service sector waste in the context of the Garki district of Abuja, Nigeria. Food waste (FW) is a global concern which is intricately linked to food safety, food security, and food sustainability. This research applies key theoretical tenets from the perspective of stakeholder theory and practice approach to identify and understand key elements (meaning, competencies, and materiality) of multi-stakeholder practices in engaging with and mitigating food waste in the food service sector. This research study aims to critically evaluate the strategies adopted by multi-stakeholders who are engaged in the provision of food services to manage and address the growing challenges of food waste (FW) in an emerging economy such as Nigeria.

The empirical data were collected using qualitative methods including participant observation in multi-stakeholder focus groups and semi-structured interviews with 32 stakeholders in the food service sector, as well as secondary sources. The intention is to investigate the fundamental causes of waste created in food services, the consequences of food waste in food services, potential techniques for the reduction of food waste, and recommendations for food service sustainability through waste reduction.

The study's findings demonstrate the significance of collaboration between core and supportive stakeholders of food services, viz. firms (owners, managers, and staff), suppliers, government agencies at both national and local level, non-governmental organisations (NGOs), research organisations, academics, customers, and local residents in the identification of the root causes of waste and its mitigation. In this thesis, the stakeholders and practises are studied. The theoretical contribution of this thesis lies in the distinct insights it provides from a single actor's perspective to a multi-stakeholder view on FW mitigation, as the majority of the academic work previously carried out focuses on the role of an individual within an organisation to tackle the issue. The study's practice contribution stems from the understanding that the work provides information both on best practices pertaining to FW management from the perspective of multiple

stakeholders in the Garki province and the challenges embedded in internal management practices which arise as a result of external actors' practices and influence. Overall, this study fills a significant gap by providing a framework which addresses multi-stakeholder interactions within the food service sector in Nigeria.

Key words: food waste reduction, stakeholders, multi-stakeholders, practice theory, sustainability, Nigeria.

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Acronyms and Abbreviation

Abbreviation	Meaning
FW	Food waste
FSS	Food service sector
UN	United Nations
SDG	Sustainable development goal
MDGs	Millennium development goal
SC	Supply chain
WRAP	Waste and Resource Action Programme
NBS	National Bureau of Statistics
FCT	Federal Capital Territory
FRCN	Federal Radio Corporation of Nigeria
NTA	Nigerian Television Authority's
FCDA	Federal Capital Development Authority
BBC	British broadcasting corporation
FEPA	Federal Environmental Protection Agency
AEPB	Abuja Environmental Protection Board
FAFH	Food away from home
UNWTO	United Nations World Tourism Organization
FAO	Food and agriculture organisation
EU	European union
NGOs	Non-governmental organisations
UAW	United Against Waste
UNEP	The United Nations Environment Programme Finance
UAE	United Arab Emirate
TCA	Tourism cultural authority
VSM	Value stream mapping
FIFO	First-in-first-out
HORECA	Hotels, Restaurants and Caterers
USD	United States dollar
SRI	Stanford Research Institute
ICT	Information and communications technology
IT	Integrated technology
SMEs	Small and medium-sized enterprises
CBO	Community-based organisations
CSO	Civil society organisations
FBO	Faith-based organisations
NAFDAC	National Agency for Food and drug Administration and Control

AMAC	Abuja Municipal area council
AFAN	All farmers association of Nigeria
NURTW	Food Produce Transporters/Nigerian Union of Road Transport Workers
AMAC	Abuja Municipal Area Council
ADB	African Development Bank
UNIDO	United Nations Development Organization
WFP	World Food Programme
FMARD	Federal Ministry of Agriculture the development
AD	Anaerobically digested
WRI	Water Research Institute
GDP	Gross domestic product
IFC	International finance corporation
NIFST	Nigerian Institute of Food Science and Technology
TETFUND	Tertiary Education Trust Fund
AFFCOM	Association of Fast-Food Confectioners of Nigeria
HORECA	hotel and catering industry

Chapter 1 Introduction

The challenges of foodservice waste in Garki, Abuja Nigeria, are substantial but under-reported. Current extant research on food waste (FW) seeks to understand FW patterns in developed countries and domains with significant efforts for its mitigation. This research focuses on the foodservice sector in the Garki province of Nigeria which has demonstrated considerable growth, accompanied by the inevitable problem of food waste. Despite this, no study to date examines the involvement of the foodservice industry in the occurrence of FW in Nigeria. This research, focused on the role of multi-stakeholders, their practices, and the intricate associations which link them in collaborative relationships in the Garki area district of Abuja, fills a key gap in research on FW. This chapter presents the research context, gaps in existing research, and aims and objectives. It also provides an overview of the conceptual framework, the research method, the structure of the thesis, and the key contributions of this study to the field.

1.1 Background and rationale of the study

Food waste (FW) is a global issue which poses a threat to both developed and developing nations, linking food safety, food security, and other aspects of food sustainability (FAO, 2019; Walia & Sanders, 2019). The United Nations' Sustainable Development Goals (SDGs) are 17 goals established by the UN as a worldwide call to action to safeguard the environment and ensure that all people live in peace and prosperity. SDG-2 deals with the issues of hunger, food security and malnutrition and promotes sustainable agriculture (UN, 2022). The call to eradicate hunger necessitates the need to improve on SDG 12, which addresses the issue of ensuring long-term patterns of consumption and production. Target 12.3 is to halve global per capita food waste, referring to retailers and consumers (Gustavsson et al., 2011) and decreasing food losses throughout the production and supply chain (Gustavsson et al., 2011, UN, 2022).

The fifth target of the United Nations Sustainable Development Goal 12 calls for a substantial reduction of waste generation by 2030 through prevention, recycling, and reuse. For these sustainable development goals to be achieved, it is necessary to identify the challenges faced in FW management practices, especially in the FS sector, and to consider how these potentially hinder the realisation of the set goal. There is a global lack of consistent information regarding FW, which introduces inconsistencies to reporting in developed countries such as the United States (Dalke et al., 2021) as well as developing countries. Furthermore, it is important to adequately understand FW challenges in Garki, Nigeria and develop strategic and multi-disciplinary approaches to the implementation of sustainable FW management in the food service sector (FSS).

Research on food service has been carried out, significantly focusing on FW (Chen et al., 2016; Gao et al., 2021; Silvennoinen et al., 2019; Canali et al., 2017), as a result of its negative economic, environmental, and social impacts. The majority of the studies investigate FW from a single food service provided, such as catering FW, focusing on the promotion of public health (Oliveira et al., 2016). Others, such as Silvennoinen et al. (2015), provide an account of destruction in Finnish food production, investigating waste in a diverse sector. The majority of these studies aim to ultimately understand how FW can be reduced and the sustainability of the food supply chain can be increased (Silvennoinen et al., 2015).

Academics believe that research on FW management is gradually growing in developed countries (Martin-Rios et al., 2018; Henchen, 2019), although the issue remains understudied in developing and transitional economies (Filimonau & de Coteau, 2019). In general terms, research on FW shows challenges in the management and reduction of FW which include a lack of infrastructural facilities, skills, and experts (Silvennoinen et al., 2019). In some cases, the government and its agencies have not shown much interest in the amount of waste generated and how it has negatively impacted the environment (Silvennoinen et al., 2019; Kilibarda et al., 2019). Stakeholders'

involvement in the management of FW within the FSS is generally recognised. Evidence from Denmark suggests that multi-stakeholder collaboration, including private and public partnerships, is required for the reduction of FW (Halloran et al., 2014). Consequently, FW reduction provides a rapid opportunity to decrease environmental consequences (Beretta and Hellweg, p.174).

Recent studies show that FW occurs at all stages of the supply chain (SC) (Silvennoinen et al., 2019; Canali et al., 2017), meaning agricultural production through to consumption (Poraral, Medin, & Lopez 2016). Efforts towards the prevention of FW in the SC are essential for stakeholders, including academics. Evidence shows that high volumes of FW occur significantly at the consumption level of the supply chain (Lebersorger & Schneider, 2014; Mena et al., 2011; Mishra & Singh, 2016), with the FSS accounting for the majority of this waste (Pirani & Arafat, 2016). Therefore, this study investigates FW generation, providing recommendations on the reduction of this waste in the Garki district area of Abuja, Nigeria from a stakeholder perspective.

Stakeholders can decrease FW by concentrating on identifying and co-creating strategies for achieving its avoidance. Food service stakeholders involve food producers, food processors, retailers, consumers, social organisations, and public authorities interested in reducing FW and operating across the entire chain (Ghinoi et al., 2020; Mourad, 2016). Successful experiences both in academia and practice show that stakeholders' involvement with distinct behaviours, values, and backgrounds is a vital enabler of the process (Morone & Imbert, 2020). The findings fill a critical gap theoretically, empirically, and methodologically by adopting the multiple approaches of interview, focus group, observation, and the visual method in order to understand how waste occurs in the FSS in Garki, Abuja. Due to the existence of similar circumstances in other African nations, the practical usefulness of this study is substantial because its conclusions and findings can be applied to other FS domains and/or any other food supply chain.

Previous research identifies that 1.3 billion items of food are lost or wasted X, amounting to approximately one-third of the total annual output (Silvennionen et al., 2015; Gustavassaon et al., 2011). Other studies represent this as percentages, estimating that between 25% and 50% of food is wasted along the SC (Mena, Diaz, & Yurt, 2011). A recent report estimates that 2.5 billion tonnes of food are wasted (WWF-UK, 2021), significantly more than the 1.3 billion tonnes throughout the supply chain. This waste is increasingly regarded as an environmental problem; as a result, the United Nations (UN) includes food sustainability as a goal for the reduction of hunger in its long-term consumption and production plans (Wahlem & Winkei, 2017). FW is a significant global concern; practitioners and institutions have paid much attention to this issue.

The reduction of FW is essential to the long-term viability of the FSS (Rios et al., 2018). Despite the significant implications of FW for the food service sector, there is limited research data linking stakeholder theory and stakeholders' roles in its management, and little attention to this subject is evident in the academic literature. Mena, Diaz, and Yurt (2011) provide some apparent reasons why all stakeholders should address FW with great concern. Firstly, millions of families globally experience hunger; wasting food raises a moral question (Stuart, 2009). Food is regarded as a natural resource; the inappropriate use of it negatively impacts the environment, including land, water, and energy (Lundqvist et al., 2008; Nellman et al., 2009). These researchers also assert that FW disposal in landfills is a significant polluter of the environment, producing the greenhouse gas methane (Griffin et al., 2009; Stuart, 2009). Finally, throwing away food exerts an economic impact as it affects everyone involved in the SC, from the point of production to consumption (Ventour, 2008).

The above concerns call for attention and the need for stakeholders' involvement in the FSS to address the escalating damage to the environment resulting from the generation of FW and socioeconomics (Morone and Imbert, 2020). This concern is widely acknowledged to be global;

Nigeria and specifically Garki's food service sector, is a contributor to this global threat. Despite widely accepted evidence that FW generates significant attention within food service activities, there is insufficient evidence that adequate attention is paid to addressing this waste, resulting in waste in all aspects of the SC. The role of innovation and the use of technology for management of the food sector is also under-researched.

In developing economies, the African continent, and Nigeria in particular, less attention is paid to FW (Dhir et al., 2020), both in practice and theory within the FSS; this negatively impacts both human health and the environment (Ogwueleka, 2013). According to reports, Nigerians throw away at least 189 kilogrammes of food per year, which totals 37.9 million tonnes annually. Nigeria ranks among the top food wasters in developing countries and is the highest in Africa (UN report, and WRAP survey report, 2021) with overall poor performance in food security, ranking 97th globally. Ironically, according to the National Bureau of Statistics, many people in the country live on less than USD$1 daily (NGN410) (NBS), with some 14 million people in Nigeria malnourished (Owoo, 2020).

Understandably, FW hotspots in the SC differ geographically (Food Wastage Footprint, 2013) and from developing to developed global economies. However, there are efforts to address waste in advanced countries, such as FW's quantity and source in Finland (Silvennoinen, 2015) and FS waste review in China, France and Italy (Dhir, 2020). The majority of the findings address the gaps within the boundaries of the developed world. Therefore, the inability to create a sustainable strategy to decrease waste at all levels in developing countries such as the continent of Africa and Nigeria in particular, poses a more significant challenge.

Again, the scarcity of studies on multi stakeholders' roles in the management of foodservice with the aim of reducing FW places many food actors such as restaurants, canteens, cafeterias, and local

food vendor owners out of business and losing food intake at the consumption stage. It can be argued that the Garki province food services sector has the potential to be effectively managed by stakeholders, with food waste being reduced. This is vital to the sector's sustainability and the improvement of the nation's economy, with many family members depending on the food sector for job opportunities and national economic development. The sector has a group of stakeholders who should collaborate to reduce the risk posed to itself and the sustainability of the environment and the population through the reduction of FW.

1.2 Key Gaps in the Literature

The previous studies on FW reduction in the foodservice sector in the context of multiple stakeholders' approaches are inadequate in both the empirical and theoretical context, and this requires investigation by researchers and academics. The current studies reveal three major research gaps, as shown in Figure 1.1. The subsequent sub-sections discuss the three main research gaps identified with further details in Chapter 2 of the Literature review and Chapter 3 of the conceptual and theoretical framework.

Figure 1.1: Research gaps
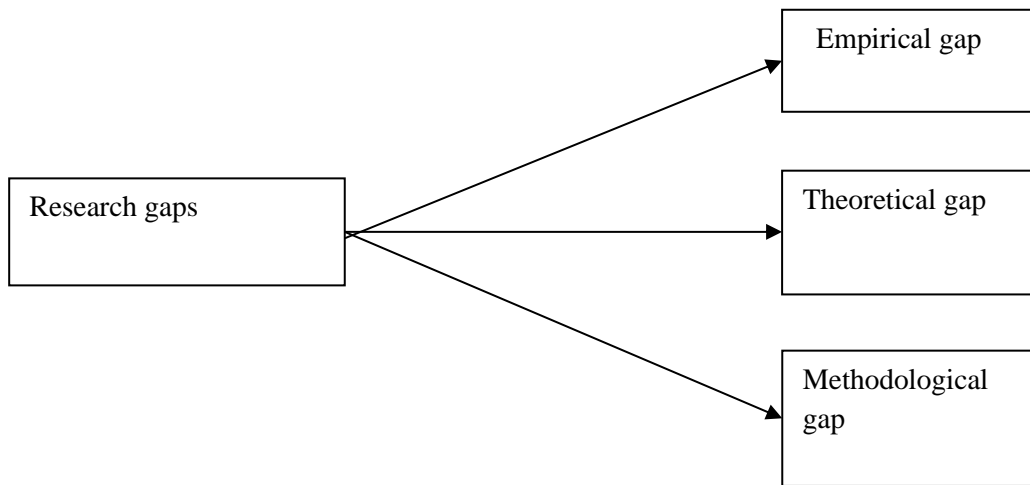
Source: Author's own

1.2.1 Research gap on food waste management and prevention in the food services literature

This research bridges a key gap in the extant research on Garki FW reduction from a multi-disciplinary perspective by examining the multi-stakeholders and practical approach to FW reduction in the Nigerian FS sector. Previous research conducted around these subjects indicates that the majority of the extant research focuses on developed nations (Sakaguchi, Pak, & Potts, 2018), and Switzerland (Silvennoinen, Heikkila, Katajajuuri, & Reinikainen, 2015). The USA, Switzerland, and Finland are particular focus areas, while developing countries such as Nigeria are generally excluded from the discussion. The fundamental limitation of these studies is that they fail to approach their subject from a multi-dimensional perspective with a broader view across boundaries, thereby creating a gap in empirical studies of food service waste from developing nations (Filimonau et al., 2020), such as in Nigeria.

Wang et al. (2017) contend that some academics deliberately exclude developing countries from association of with food waste, although food is lost due to the view that FW occurs downstream, while food is, in reality, lost at the upstream stage of the SC. Researchers further argue that developing countries face food loss due to a lack of infrastructure (Papargyropoulou et al., 2014; Kilibarda et al., 2019; Rodgers et al., 2015). This situation is one cause of the lack of studies to address FW in developing countries such as Nigeria from the perspectives of academics and practitioners. Nevertheless, this study indicates that this is not the case, as FW is a global issue and a significant problem in developing countries confronting expanding populations, urbanisation, and poor incomes. FW issues do not exclude any continent, countries, or geographical territories.

This study specifically argues that FW is a global concern; its impact affects all of humanity irrespective of its location, therefore, its studies and approach cannot be a uniform construct because experiences vary according to region, triangulation culture, and practices. The mitigating approach also cannot be limited to a particular regional group of service providers or stakeholders for the analysis of global FW issues in terms of their causes and prevention. Other academics assert that FW should not be generalised (Wahlen & Wnkel, 2017; Aschemann et al., 2015) but should instead focus on contexts (Wahlen and Winkel, 2017).

As generalisation has failed to approach FW in developing countries, this explains the increase in waste. This is particularly important in the case of Garki foodservice stakeholders who have had experiences and a worldview of unique and complex FW management issues over a long time period. Consequently, it is essential to understand the stakeholders' views on FW management behaviour in the context of practice elements meaning competencies and materiality. To achieve food sustainability, stakeholders need to integrate their practices in order to achieve the reduction of FW as an outcome.

The element of practice which represents values, norms, and beliefs, competencies meaning abilities and knowledge, and their materiality in the form of infrastructure, tools, and technology, is an function which is carried out by management. Therefore, this study seeks to understand how engaging multiple stakeholders in different practices could reduce FW in the Garki foodservice sector.

1.2.2 Research gap in multi-stakeholders and practice approach literature

Extant FW research at each phase of the supply chain has primarily relied on the scope of practice (Hargreaves, 2011; Sonnino & Williams, 2011; Spaargaren, 2011; Goonan et al., 2015; Dyen, Sirieix & Costa, 2021; Plessz & Etile, 2019) and the stakeholder approach (Wallace & Michopoulou, 2019; Ghinoi et al., 2020; Caniato et al., 2014; Morone & Imbert, 2020) to understand FW management practices. There is a need to enquire beyond this conceptual background because practices go beyond a clear understanding of what the practices are or should be and/or the outcome of firms' practices. Moreover, previous studies focus on the competencies of the organisations' actors.

Waste reduction in foodservices should not be narrowly focused on the competencies of the stakeholders in terms of their knowledge and/or skills. If, hypothetically, foodservice waste issues are considered from a competency perspective, researchers might overlook other aspects related to FW reduction strategy, which could have been key to the sector's waste reduction and sustainability. It is not sufficient to address a complex issue from one perspective, but it is necessary to view the challenges and ways to mitigate the generation of FW from a wider practice view. Therefore, it is necessary to adopt a multi-disciplinary and theoretical approach to waste management from the perspective of stakeholders and practice theory, which enables the consideration of foodservice stakeholders' practices holistically.

This study's theoretical framework combines the key tenets of stakeholder and practice theory to examine how FW occurs in food services as a result of stakeholders' everyday practices. The premise is that if 'doing' causes food waste, then 'doing' can also reduce FW by behavioural changes which allow things to be done differently. Food service stakeholders' activities can pose a challenge to the sector if not properly examined, with recommendations being made.

1.2.3 Research gap on the methods of application on the study context

This study also addresses a key empirical gap in the study of FW management in Nigerian food services and their practices. The majority of the extant research which investigates FW from the services sector uses quantitative methods (Wu et al., 2021; Principato et al., 2018) to examine its causes and how actors respond to the challenges. The same is applied to understand their response to a change in practical behaviour. This approach subsequently fails to provide additional theoretical understandings required to understand why particular practical behaviour in the food industry over a period of time has, or has not, changed.

Few studies carried out in the food sector using a qualitative approach have been conducted in the beverage processing industry, which is dominant within the western part of Nigeria, with fewer food services. Specifically, existing research does not explore the expanding urbanisation of growing and developing cities. Significant investment by corporations and governments has led to the demand for food outside the home due to the significant migration of people for business and private activities. This study addresses this literature gap by using a metropolitan area as its research site.

Further, an additional disadvantage of past studies is a lack of adequate research on FW management in the literature, which focuses on the food services sector downstream and addressing FW from multiple food actors. The sector drivers' interest in foodservice management should not be underrated to understand the cause and mitigating strategy in FW management

practice in the Garki province of Abuja. Therefore, this study selects both core and supporting food services stakeholders and uses qualitative methods such as in-depth interviews, focus groups, and observation methods to comprehend misunderstandings linked to the food services practices of Garki stakeholders in Abuja, Nigeria.

1.3 Study area (Garki Districts, Abuja)

Garki is located in the Federal Capital Territory (FCT) in Abuja, the capital and administrative centre of the Federal Republic of Nigeria. Located between 8° 27' – 9° 20' North and 7° 25' – 7° 45' East (Figure 2), FCT Abuja covers an area of 8,000 square kilometres and is centrally positioned within Nigeria. It is 476 metres above sea level and surrounded by the states of Nasarawa (East), Kaduna (North), Niger (West), and Kogi (South) (Oluwafemi and Oluwayinka, 2020; Owolabi, Ogunsajo, Bodunde, and Olubode, 2020). Latitudes 8° 56' 48" to 9°1' 48" north and longitudes 7°17' 00" to 7°22' 12" east define the study region. The 2006 census rated the Federal Capital Territory of Abuja as Nigeria's seventh most populated city, with a population of 1,406,236 (NBS, 2019). In contrast, the population of Garki is 206,139,589 (NBS, 2019; Statista, 2020; Boluwade, 2022; Boluwade, 2022).

Abuja grew by 139.7% between 2000 and 2010, becoming one of the world's fastest-growing cities (Boumphrey, 2010). The headquarters and subsidiaries of government agencies are concentrated in Abuja and the majority of multinational corporations' administrative offices are located in Garki, with most governmental, business, and political decisions being made in the vicinity of Abuja's FCT. The city's continued annual population growth has resulted in the construction of satellite towns such as Karu Urban Area, Suleja, Gwagwalada, Lugbe, and Kuje, among others. The metropolitan agglomeration centred on Abuja had an estimated population of 2,959,199 in 2014 and 3,564,126 in 2016, with 2,215,000 young people constituting 62.1% of the population (NBS, 2019). For the fourth quarter of 2020, the Nigerian National Bureau of Statistics (NBS)

recorded a working age population of 2,940,209 and 663,931 unemployed individuals in the metropolitan region of Abuja, yielding unemployment and underemployment rates of 40.4% and 13.1%, respectively (NBS, 2021).

This research's study area (Garki) is one of the Districts in phase one of the city's development plan; this includes the inner Maitama Districts, the Central Area, Asokoro, Wuse, and Garki extending from the base of Aso Rock. Other phases include phases two to five, during which physical and structural development continues. The context of this study is the Garki 1 District cadastral Zone A01 and Garki 11 District cadastral Zone A03 of the FCT, Abuja (Ezeamaka and Oluwole, 2016). Figure 1.2 presents a map of the FCT depicting phase one of Garki.

Figure 1.2: Map of Nigeria Showing the FCT and the location of Garki Districts
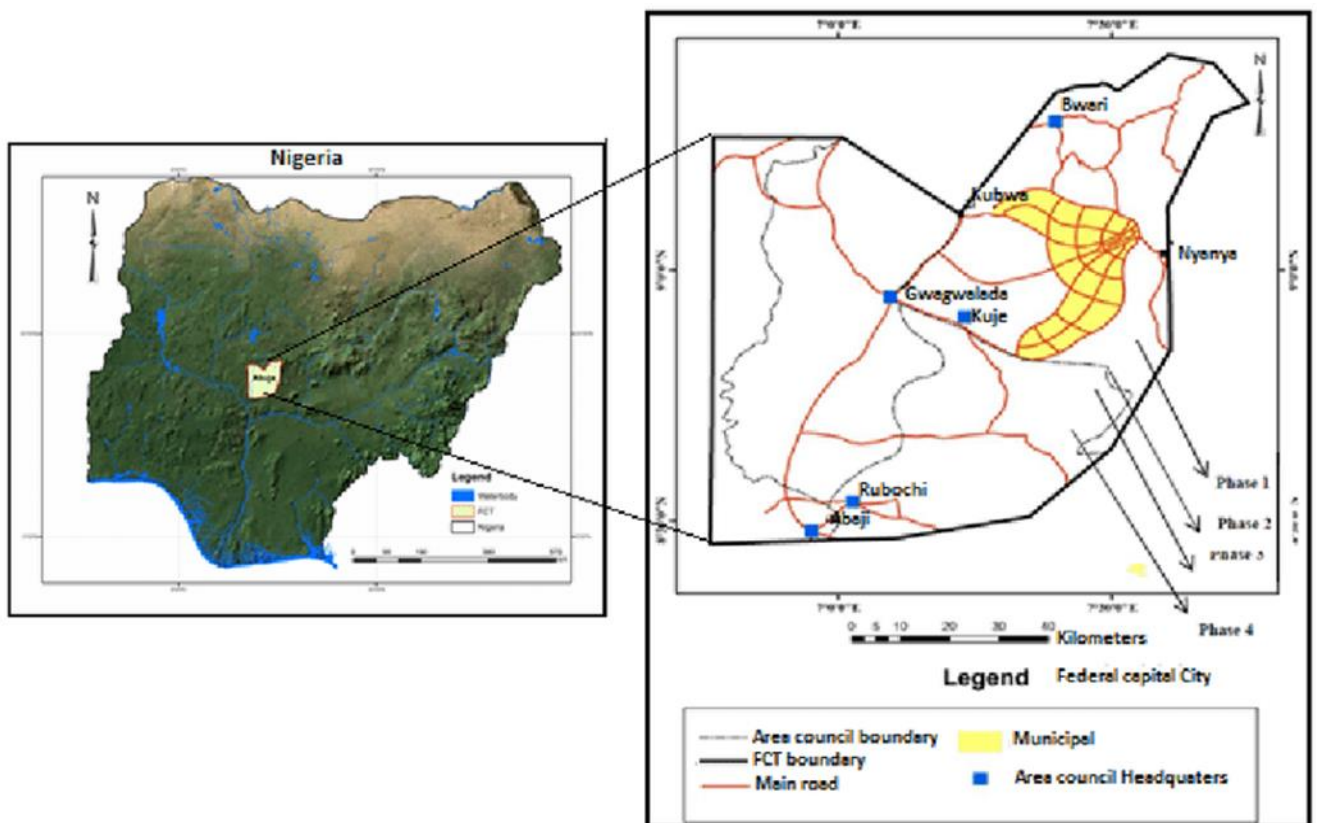
Source: Modified from Ukoje and Kanu, 2014

1.4 Research context

The challenges of FW in Garki Nigeria are extensive but under-reported. However, there have been efforts by researchers to understand how FW is generated in in different sectors (Kilibarda, 2019; Dhir et al., 2020; McAdams et al., 2019; Gao et al., 2021), although no research has provided insight into FW in the Garki FS services sector. No studies have been able to identify data on FW for Nigeria's foodservice sector therefore it was not possible to provide an estimate of its magnitude. Despite this, reports indicate that Nigerians throw away at least 189 kg of food year, totalling 37.9 million tonnes annually. Nigeria ranks among the top food wasters in developing countries and the highest in Africa, with overall poor performance in terms of food security, ranking 97th globally. Though, according to the National Bureau of Statistics, many people in the country live on less than USD$1 (NGN410) daily (NBS), with some 14 million people in Nigeria being malnourished (Owoo, 2020). The lack of specialised knowledge on the patterns of FW occurrence in foodservices of Garki, Nigeria and approaches to its mitigation is a major research gap which this study aims to close.

This research focuses on Garki, an area known to accommodate private and public corporations who conduct business on a large scale (Table 1.1). The nature of business activities such as manufacturing and construction, the service sector, private offices, trades, government establishments, and political manoeuvring have resulted in massive in-and-out movements. This has provided an FSS presence in the Garki area of the Federal Capital Territory (FCT), and the city as the case context has received an influx of migrants from other parts of Nigeria. Specifically, these are rural migrants who perceive Abuja as safer in terms of security and better infrastructure with better economic advantages because these are lacking in the majority of the rural communities. Hence, the rise in formal and informal business activities increases the need for food outside the home.

In the FCT, Garki is acknowledged to be a major commercial centre which houses the famous Abuja International Conference Centre, Garki market, the Garki Hospital, and the Nigerian Armed Forces Headquarters, comprising the Army, Air Force, and Navy headquarters. This district houses the country's tallest building the Radio House, and the Federal Ministry of Information and Communications and the Federal Radio Corporation of Nigeria (FRCN) is also located here. The stations and corporate offices of the Nigerian Television Authority (NTA) are located in Garki. The Federal Capital Development Authority (FCDA), which oversees and manages the administration of the Federal Capital Territory, is located in Area 2, Garki.

Banks are located in Garki along with the ultra-modern markets which are known for their fabric design work, sports pitches, and exercise spaces. Garki accommodates eateries and hotels whose activities are visible with attractive features for comfort. Thus, the city's road is networked with the country's federal highway to deliver an easy link to the remote countryside and states surrounding Garki, such as Kaduna State to the north, Niger State to the west, Kogi State to the south, and Nasarawa State to the east. The road network is designed to help move people in and out of the area for one business purpose or to integrate business activities with other parts of the country.

Garki's economic sector is divided into six areas in this study as there is no known data available for the area's economic classification.

1. Government establishments

2. Tourism and hospitality sector

3. Foodservice sector

4. Trade (production, agriculture, and retail) sector

5. Construction sector

6. Other service sector, including education, transportation, technology, and banking.

These five economic classifications play a vital role in the economic development of the Garki area, a popular area of the FCT. These businesses have supported Abuja and have led to a rise in residents' social, economic, and lifestyle standards. However, there are security fears in and around the city, although this is less than other parts of the north-central region, and the military and other security agencies provide security such as civil defence and regular policing.

Table 1.1 Business activities around Garki, Abuja

Classification	Nature of business
Government establishments	• Federal ministries' headquarters • Federal capital development Authority (FCDA) • Government parastatals • Government agencies
Tourism and hospitality sector	• Hotels • International conference centre • Life parks • Gardens • Ultra-modern market • Mongolia Amusement Park
Foodservice sector	• Hotels' food service • Restaurants • Cafeteria • Canteen • Local food vendor • Catering such as supermarkets
Trade (production, agriculture, and retail) sector	• Animal rearing • Agricultural food distribution • Farming
Construction sector	• Road • Housing
Other service sector	• Schools • Transportation • Technology • Consultancy services • Banking and insurance

Source: Author's own

Therefore, businesses operate in compliance with the national law, and businesses have a share in the economic opportunities available. For example, wholesale and retail trade business accounts for 9%, ICT 11%, banking 7%, and accommodation and food service business 18% of the total business around Garki (Economic Development in Urban Nigeria Report, 2015). The concentrations of businesses around Garki are shown in Table 1.1 allowing for movement in and out of foodservice outlets.

1.5 Food waste management in the context of Garki Districts

In developing countries, the management of FW is a complex concern (Olukanni & Nwafor, 2019; Amasuomo, Tuoyo, & Hasnain, 2015; Martin-Rios et al., 2018) and has been on the priority list of successive governments, local authorities, and foreign donors in recent years. The extent of FW has generated calls for multi-stakeholder intervention in identifying, preventing, controlling, and accounting for the volume, disposal, and effect on the various host communities. FW has been reported in various government papers (BBC, 2018; The Nigeria Voice, 2018; Apo Press Release, 2020), seminars and workshops, and paper articles (Apo Press Release, 2020). The consequence of FW is a significant concern raised by most commentators.

Despite these efforts, there is little awareness of the results of waste. Formal and informal institutions (national, regional, state-level, local governmental, and various community) authorities play a role in reporting FW by drawing the attention of relevant government agencies to addressing it. These agencies include:

1. Abuja Environmental Protection Board
2. The Federal Environmental Protection Agency
3. Garki waste disposal agency
4. Private sector companies and commercial activities (for profit)
5. Informal waste companies (local firms)

Representatives of these agencies have independence within their geographical area to formulate and implement policies to support their various mandates to assure a safe and healthy environment. This is a responsibility contained in the concurrent list of the Nigerian constitution, which allocates responsibilities to all tiers of government in this regard. However, their functions have not attracted significant attention because most of these agencies lack the capacity in terms of human infrastructure to carry out their duties. There is a need to re-engineer the framework, establishing the collaboration of organisations with optimal performance with other global societies addressing FW worldwide. Under Degree 58 of 1988, the Federal Government Environmental Protection Agencies position in Nigeria was enacted as a landmark defined by the Federal Environmental Protection Agency (FEPA). The essential role of FEPA in the supervision of solid waste (Onibokun, 1999) is primarily for the reporting and enforcement of the legislation to protect the environment.

The laws and regulations passed by FEPA include the 1991 National Solid and Hazardous Waste Safety Management Regulations. The management of waste in Abuja is the responsibility of the Abuja Environmental Protection Board (AEPB). This organisation is responsible for the removal, transportation, and disposal of waste, whether industrial, commercial, or domestic. The Federal Environmental Protection Agency (FEPA) has enacted various laws and regulations to regulate waste disposal in the FCT. The board evaluates the most reliable systems appropriate for local, household, and industrial waste. Responsibility may also necessitate a review of recycling as a waste management option for businesses and government agencies (Imam, 2008).

The quantity of waste generated has increased in diversity and quantity without sufficient expenditure on facilities for collection, transportation, care, and disposal. Political, economic, and social variables further complicate these issues. The median generation of FW in the Abuja Garki

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area is 43.75 % of the total domestic form of FW generated (Magaji & Mercy, 2020). The time of year, local culture, customs, and personal income are all factors which impact this.

In Nigeria, FSS is well-patronised; it provides restaurants, cafeterias, catering, and local food vendors, accounting for a substantial proportion of the SC's downstream activities, which contribute primarily to FW (Olumakaiye & Bakare, 2013; Heikkila et al., 2016) and provide support for the economy. The FS contributes significantly to employment (Eurostat, 2018), FW, management, and other sustainability issues. The value of the sector increased from NGN25.2 billion to NGN190 billion (Nigerian naira) between 2004 and 2009 (Carew, 2010; Ogundari et al., 2015). The result may be due to people's habits, as fast food has significantly become part of many Nigerians' lifestyles, especially in urban centres such as the Garki-Abuja area (Esohe, 2012).

In Nigeria and the Garki area, no research has estimated the amount of food cooked and wasted per day, month, or year, which is a significant research gap. However, this study does not intend to assess the volume of food cooked, but rather to ascertain how FW is generated within the FSS and provide a stakeholder recommendation to reduce it from the study's various foodservice contexts. The Garki district area of Abuja has a high concentration of foodservice outlets. The large numbers of government establishments, private offices, and corporations, such as construction, production, and retail, mean that most workers live far away from their homes (Olumakaiye & Bakare, 2013). This accounts for the reason for the growing number of outlets. Food away from home (FAFH) has been associated with an evident and significant increase in fast-food service providers on every street and corner in both the highbrow and downtown areas of urban and semi-urban areas of Nigeria over the last two decades (Ogundari et al., 2015).

Garki area residents are predominantly people who must eat food away from their homes during work hours, ranging from 07:00 am to 5:00 pm daily from Monday to Saturday. On Sundays, the

FSSs provide services for people who have come out to socialise on their free days from work. This lifestyle also amounts to concentration on food demand at the supply chain's consumption stage in Nigeria. It produces a corresponding FW volume with no evidence from the empirical or the practitioner angle to tackle this FW in Nigeria. This research seeks to fill the literature gap by investigating the route for FW and measures to decrease waste in Abuja's Garki district area.

This study provides a managerial recommendation to the government and practitioners of the FSS by exploring qualitative methods and approaches based on different stakeholders' world views. In view of these considerations, it further seeks to enhance understanding of multiple stakeholders' roles in identifying the source and reduction of FW as feedback for the creation and development of a balanced FSS to improve the economy.

1.5.1 Sustainable FS sector opportunities in the Garki area

Food service has continued to expand with the formation of agencies and parastatals by successive governments. Garki is more of a business district, and people who work and come into Garki do so at a distance from their homes, hence the necessity for them to eat away from home. Over these years, Garki has continued to accommodate the influx of food service vendors. The Waste and Resource Action Programme (WRAP) divides the FSS into two parts; the first is the profit sector environment, which includes restaurants, cafeterias, fast-food restaurants, take-out eating places, canteens, bars, and catering, such as supermarkets. The primary function of these businesses is food service provision and profit maximisation (Sundt, 2012; Oliveira et al., 2016). The second is the cost sector, which comprises schools, universities, healthcare, correctional centres, and staff catering (Dhir et al., 2020); this functions in premises owned and operated by third parties to provide service to staff and/or other service users, such as hospital patients or students (Oliveira et al., 2016). This research study focuses on both the profit and cost aspects of the FS. The FS in Garki districts focuses on restaurants and mobile food service activities, event catering, and serving

activities. The sector has many stakeholders whose role can positively impact firms' activities. The various food service outlets provide timely services for their customers who rely on them for their food intake, leaving the effect on the environment of waste generated due to this massive patronage of food intake. Little is known about stakeholder roles in the food supply chain generally, and specifically FW reduction, although the sector has contributed significantly to the FW generated within the districts of Garki.

The sector has large, medium, and small-scale businesses; it provides support for the development of the economy (Sanni, 2009), and Garki in particular. The FSS offers employment opportunities, contributing to GDP, thereby increasing earnings from tax levels as a revenue source. The FSS is well-known as the lifeblood of the tourism and hospitality sector of the economy, generating some USD$1.3 trillion alone in 2012, mainly from patronage (Babalola & Oluwatoyin, 2014; Inglehart & Baker et al., 2000). It is well-known that the hospitality sector relies on the food services globally for survival; the United Nations World Tourism Organization (UNWTO) confirms that between 70% and 75% of international tourists spend the majority of their money on FS on an annual basis (Akpabio, 2007). As such, the sector has strategic importance to the economy.

The foodservice business including catering, fast food outlets, clubs, and snack bars is peculiar to hospitality services and tourism, providing accommodation, banquet halls, and event tents (Adeola & Ezenwafor, 2016). Garki Abuja has benefited specifically from the FSS with economic development through tax receipts, job creation, social life provision, beautification of the areas, and fast-food consumption. As mentioned earlier, both the food service's profit and cost aspects (Sundt, 2012) play a significant role in the generation of FW and mitigating them for food sustainability. Unverified figures estimate that Garki Abuja has over 805,000 (eight hundred and five) specialised varieties of companies which provide dishes and services. These services include restaurants and the management of events such as catering for birthdays, anniversaries, weddings,

conference services, outdoor catering, flight catering services and others, all potentially generating food waste. Both districts of Garki 1 and 2 have similar characteristics in terms of the food services provider, as shown in Table 1.2 below.

Table: 1.2 Characteristics of business activities in Garki area

Garki area districts	Business activities
Garki 1 District Cadastral Zone A01	Mainly five-star hotel such as Nicon Luxury Hotel Kitchens Restaurants Catering services Private wholesale and retailers
Garki 11 District Cadastral Zone A03	Residential areas Recreation areas (garden) Catering services Shopping centre Banks and other commercial offices Nigerian Armed Forces – Army, Airforce and Navy (HQ) Housing Federal Capital Territory (HQ)

Source: Author's own

The increase of these food services calls for an improvement of FW management strategy which can positively influence the community and ensure food availability to the growing population of Garki districts and Nigeria at large. Therefore, promoting the improvement of the food services in the Garki area will improve people's livelihoods, encouraging the sector's survival in the form of restaurants, catering services, canteen, local food services, cafeterias, thereby saving lives and the environment.

1.6 Research aim and objectives

This study is guided by the overall aim of understanding how different stakeholders' practices can help reduce FW in the foodservice sector in Garki district, Abuja, Nigeria. The study undertakes an analytical review of FW management practices as a vehicle for understanding stakeholders' activities in the food services in the Garki districts. In particular, the emphasis is on exploring and understanding how FW is generated and how the roles of different stakeholders intersect with, and impact on, sustainable FW reduction. This study is guided by the following research objectives:

1. To contextualise the problem of FW in Garki district's food service sector.

2. To conceptualise multi-stakeholders' practices and their role in FW reduction.

3. To critically review multi-stakeholders' practices and their roles in the reduction of FW in Garki district's food service.

4. To present a model illustrating best practice in the promotion of sustainable food service practice in Garki districts to inform policy, practice, and future research on the subject.

To achieve the above aim and objectives of this study, and to bridge the gap in existing literature on FW, the following research questions are addressed:

1. What are the causes of FW in Garki districts food services?

2. How has FW generation impacted the food services sector and created challenges in Garki districts?

3. How do management practices across food service sector networks in Garki, Abuja, affect food waste?

4. How do multi-stakeholder-practices help to mitigate the generation of FW in Garki districts?

5. What are key lessons that can be learned from case insights to address the issue of FW?

1.7 Conceptual framework

This study's conceptual framework is guided by stakeholder theory (Freeman, 1984) and practice approach (Bourdieu, 1972). Theoretical insights help to conceptualise the problem of FW within the food service sector, illustrating how multi-stakeholders' practices can bring about the reduction of FW. This view allows for an understanding of the impact of various individuals involved in FW management within the FSS.

Stakeholder theory identifies food service stakeholders and examines their profiles in depth. It provides an understanding of the various stakeholders' attitudes, interests, expertise, challenges, and views and their understanding of FW issues. The practice approach helps to identify and comprehend the various activities with which these actors are involved, and how they play their various roles in working within the available resources and ideas to achieve a result. The significance of the conceptual approach of this study is to examine the various stakeholder-practice perspectives on FW in the FSS because they are key players and would have close contact with FW issues.

The conceptual frameworks provide the instruments required to investigate in-depth and interact with FW generators, policymakers, and other sector stakeholders. This framework allows for rich and reliable data at every level of their involvement at local level (local council and foodservice stakeholders), state-level (state government and foodservice associations, and non-profit organisations), and national level (central government bodies and policymakers) in contributing to FW avoidance and foodservice development. This perspective provides an insight into FW's negative impact on the FSS and stakeholders' impact on waste.

1.8 Research methodology

Qualitative research is used to investigate the different roles of stakeholders in the FSS in defining methods for the reduction of FW. Stakeholders in the food service of Garki districts 1 and 11 are part of the research analysis unit. These are based on access, availability, type of FS such as buffet, à la carte, or a combination of the two, price range, type of cuisine, type of consumer, principal feature such as workplace canteen, hotel restaurant, banquet facility, or independent restaurant, and size, being volumes served per day for meals.

The chosen context of these studies is not intended to explore the entire FS market, but rather to provide opportunities for understanding the sources of FW and ways of reducing it. The research explores the generation of FW from the procurement of raw food supplies, storage of food, preparation, cooking and consumption (Papargyropoulou et al., 2019) but does not include the removal of FW because this is beyond the scope of the study. For data collection, semi-structured in-depth interviews, focus group discussions, and observations were explored and analysed qualitatively. The study discusses possible management practices in FW and how stakeholders' involvement can provide recommendations to practitioners in the FSS on possible responses to FW route identification and reduction.

The constructivist approach helps to socially construct multi-stakeholders' practices and to gain an understanding of the sector's stakeholders' worldviews and how their actions could influence the outcome (Lincoln et al., 2011). The constructivist approach is most relevant to this research; it provides the basis on which to explore and understand how waste occurs and ways to manage FW within the sector. The challenges in FW management, with specific insight from the stakeholders' viewpoint, for example economic, political, and cultural, influence the perception of issues and reactions. FW accounts for the majority of research in the FSS (Papargyropoulou et al., 2016).

Few studies review stakeholders' involvement at various levels in Nigeria, and none employ a qualitative approach to investigate the role of national, state, and local council level stakeholders in addressing the issue of FW. Thus, methodologically, this research study fills a key gap. The study includes policymakers, foodservice firms, the local council (specifically within Garki district areas with significant knowledge of FW such as workers and council officials), media, food market associations, and non-profit organisations. A non-probability purposive sampling procedure was applied to ascertain how "certain types of individuals or persons displaying certain attributes get involved in the study" (Berg, 2007, p.51). Such participants provide expert opinions or critical information (Valos et al., 2016). These experts are recruited specifically from the study context of the Garki area of Abuja, Nigeria. Further, secondary data were collated and analysed, such as firms and institutions' brochures, websites, and publications to identify and understand the stakeholder's role.

The data collected were also analysed and categorised to develop themes. The frequency of the themes detected was not the basis for the researcher's selection of theme from the data, but their link to the research questions (Braun & Clark, 2006). Thematic analysis was used to critically review and code transcribed qualitative data (Braun & Clark, 2006), and the transcripts were printed out and classified according to key themes. Data were then coded and analysed to generate concepts and relationships representing schematic analysis and identifying the correlation between concepts, being thematic analysis (Verrynne, Parker, & Wilson, 2013, p. 410).

The second phase involved the creation of a systematic coding system, representing a thematic framework which represented the primary topics and sub-themes of the study (Bazeley & Jackson, 2013); this whittling down results in 'conceptual clarity' (Bazeley & Jackson, 2013, p. 97). While the literature provides the background for the theme, this approach also enabled the discovery of

new concepts based on the data, representing inductive reasoning; the study analyses FW identification, courses, and ways to reduce waste according to stakeholders' recommendations.

1.9 Structure of thesis

The thesis is divided into chapters which provide a clear illustration of the steps involved in carrying out the current research investigation. This is in addition to this chapter which presents the study's background and rationale, research gaps, and the study's aims and objectives, along with the key contribution of research, the thesis comprises of six additional chapters, the summary of which will now be presented.

Chapter 2 reviews existing literature relevant to this research, such as conceptualising waste in the FSS. This research includes studies on FW in Africa and the waste reporting system in Nigeria. Furthermore, the study reviews FW classification details, focusing on the FSS to identify sources of waste and approaches to manage it during its operational stages (pre-kitchen, kitchen, and post-kitchen). FW predominantly occurs in the FSS, impacting the organisations' sustainability, the environment, monetary issues, food insecurity, economic losses, and the way in which innovation can improve food supply operations. This research introduces a theoretical lens and gaps are identified with a summary to conclude the chapter.

The conceptual framework in Chapter 3 provides an insight into the theoretical view adopted in this study and how its approaches fit with the phenomenon under investigation. The chapter discusses the role played by the various stakeholders in the foodservice sector in Garki and how their practices influence the operations of the sector at the pre-kitchen, kitchen, and post-kitchen levels of the supply chain. Furthermore, stakeholder-practice theory is used to examine the seemingly mundane practices of the food FSS in the Garki district in Abuja which remain largely under-studied. The various concepts are explored, and a framework is developed based on the

integration of concepts and theory, which provides a model for understanding the reduction of FW within the foodservice sector of Garki District, Abuja.

The methodology in Chapter 4 details the research design employed in the current study. It begins with a description of the philosophical framework used in the research, after which it defines and explains the qualitative method as the study's research technique. The research design explains why in-depth interviews, focus groups, and observation methodologies are chosen to address the research questions. The following section of the chapter considers the various stages of conducting semi-structured interviews and focus group discussions in greater depth; there is discussion of how data was analysed, and the chapter concludes with a discussion of the ethical issues that were considered during the research.

Chapter 5 provides an understanding of the profile of the key foodservice stakeholders and outlines the role they play in sustaining the foodservice sector in Garki districts. It also provides discussion of the causes of FW from the perspectives of food service stakeholders by identifying the main causes of FW in Garki Districts 1 and 11 of Abuja; these are primarily: (1) poor cooking skills of the chef, (2) lack of planning for the reuse of leftovers, (3) lack of communication amongst stakeholders, (4) poor menu planning, (5) inappropriate behaviour of kitchen staff, (6) lack of use of technology, (7) transportation mode in the case of perishable goods, (8) large portion size/overproduction, (9) the nature of the environment, and (10) lack of awareness of the impact of FW. The focus of the chapter is to provide an understanding of how this FW occurs, thereby providing a basis to address it.

Chapter 6 emphasises the key challenges of managing FW in the foodservice sector and the consequences which arise for the sector and the wider society, such as (1) environmental impact and (2) social and (3) economic consequences. The chapter provides a multi-stakeholder practice approach to FW management, emphasising collaboration amongst actors at the three operational

stages of food service, such as pre-kitchen, kitchen, and post-kitchen. It also provides an emerging opportunity for future growth and development of sustainable food services. Due to a growing awareness of sustainable FW management and the unique nature of food security, this offers the potential to increase stakeholders' collaborative networks and exchanges between the public and private sector members who have a stake and enhance the awareness and adoption of sustainable practices.

The conclusion of the research is provided in chapter 7. The section begins with an overview of the entire study, followed by a discussion of its theoretical, methodological, practical, and policy-level contributions. The chapter finishes by discussing the limitations of the research and identifying additional research areas for future studies.

1.10 Contribution of research

This study contributes theoretical, methodological, practical, and policy-level findings (Table 7.1). To meet evidence-based policy formulation requirements, policymakers and managers have always used a variety of evidence sources when making policy and service organisation decisions (Mays et al., 2005). Academics believe that the benefits and quality of a research contribution depend on two factors: the degree to which a proposition challenges existing beliefs or norms through its originality and interest, and the degree to which it enhances and advances understanding of core beliefs and norms (Corley & Gioia, 2011; Janiszewski et al., 2016). Thus, research should advance and challenge knowledge. This study also advances stakeholders' and practice theory by providing a novel and intriguing perspective on how food waste is generated and how to reduce it in the Garki District's food service sector. This study's findings can also inform management and policymaking (Whetten, 1989). Examining relevant research, interpreting data, and critically reviewing relevant research yields the identified contributions.

Theoretically, this thesis's significant contribution is the introduction and definition of multi-stakeholder practise theory, which provides practice-based insights into multi-stakeholders' role in food waste mitigation. No study known to the researcher has introduced the multi-stakeholder practise approach to food waste management or any other research. This thesis defines the concept and provides empirical evidence for it. Following this, a conceptual framework has emerged from these theories: a multi-stakeholder-practice approach to food waste reduction, thereby creating new knowledge and information by enriching the literature with views from different perspectives (Chapter 7.1). The framework highlighted the following four principal elements of the research: (a) Recognizing the importance of multi-stakeholder collaboration as a long-term link to FS waste reduction (b) Identifying food waste level management practises and the role of multiple stakeholders(c) an increasing quest for stronger coordination and integration of multi-stakeholder practises in food waste management. (d) a new concept for developing and improving food waste management practices, capabilities, and strategies for achieving a collaborative advantage.

This research makes a contribution to knowledge through the application of multi-stakeholder practise theory in food waste management, i.e., waste generation and mitigation, within the context of a developing country, Nigeria. This is achieved by investigating and analysing a range of stakeholders in the food service sector and their everyday activities and how they impact the food waste management sector in Garki, Nigeria. In addition, the experiences and opinions of key participants involved in the food service sector were obtained and analysed. By utilising the stakeholder theory as the guiding theoretical framework, it emerged from empirical data that in Nigeria, internal management, stakeholder collaborative and external stakeholder practices are means to achieve FW route identification and reduction.

This research argues that a practise perspective is useful for studying FW because it allows stakeholders to understand the dichotomies in their personal and social practises and how social

relationships can contribute to regressive mind-sets even if they are personally opposed to FW. (Connell, 1987; Hennchen, 2019). This study takes a multi-stakeholder practise perspective to show how stakeholders' intricate ties affect food waste. The thesis contributes to journal debates on multi-stakeholder collaboration (Bhattacharya & Fayezi, 2021), food supply chain classification (Richards et al., 2021), and food waste reduction in an emerging country (Matzembacher et al., 2021). These studies have neglected food service stakeholders. Thus, this study proposed firm-level multi-stakeholder practises in addition to stakeholder class identification and initiatives.

The conceptualization of social practise includes a detailed identification of dimensions with a set of sub-practice elements: materials (things, technology, and infrastructure), meaning (symbolic meaning, ideas, norms, value, ethics, and aspiration), and competence (knowledge, skills, and technique) (Pantza & Shove, 2010). Practice these subsets alone or together. Compared to previous studies on food waste management, this concept (practise) has been presented and applied in isolation to understand food waste generation and strategies to reduce it, with limited success because global evidence on food waste has not seen significant reductions, with evidence of growing waste in developing countries. Thus, a multi-stakeholder food waste management approach must be implemented.

The use of a practice-based approach to understand stakeholders in an unfamiliar study context like Nigeria is theoretically significant. According to the researcher, these theories have never been used in Garki, Nigeria. Thus, applying these theories to FW issues in Nigeria's FS sector, both alone and in combination, would theoretically contribute to the research.Due to the Nigerian FS market's uniqueness, this study integrated stakeholder and practice-based approach concepts to create a holistic understanding of the sector's waste management behaviour. This approach helps stakeholders understand the importance of identifying their roles and how practises are applied to

different streams of knowledge that can be used to develop the foodservice sector. Thus, a multi-stakeholder practise approach has identified Nigeria's FS stakeholders, roles, and broader FS practises.

Secondly, this study uses semi-structured interviews, observation, and focus groups to examine the food service sector's food waste practises in Garki, Abuja, Nigeria. Most studies on food waste use quantitative methods, according to the literature review (Drabik, Gorter, & Reynolds, 2019; Eriksson et al., 2020). Most quantitative studies quantify food waste without considering stakeholders' daily actions. This strategy does not provide the theoretical and practical insights needed to understand food waste and how to reduce it. However, qualitative methods provided in-depth knowledge about food waste route identification and reduction within the FSS, allowing stakeholders' practises, particularly expert professional opinions and worldviews, to be interpreted. Observation gave the researcher a first-hand view of activities, which piqued their interest and added valuable layers to the findings.

In practice, this study advances practical concepts by linking theory and practise (Corley & Gioia, 2011). This thesis offers management and practical tips to the food service industry and serves as a tool for the strategic process of waste mitigation. These emphasise that foodservice stakeholders should design a model to apply a multi-stakeholder approach to their practises, where each stakeholder can share knowledge, value, and ideas to support foodservice operations. Stakeholders must also understand the importance of different knowledge streams in the foodservice sector's development. This study also shows how actors' understandings of their roles can help firms achieve cohesion, mobilisation, and action through dialogue, collective decision-making, and jointly implemented decisions.

Finally, this study has policy implications. This suggests that critical stakeholder groups should be involved in the FSS at all stages of the firm's operations—pre-kitchen, kitchen, and post-kitchen. Kitchen staff, chefs, and the community can help the sector develop economically, environmentally, and socially (Papargyropoulou et al., 2016; Gao, 2021). It shows how strong food waste management policies can help Garki district food services achieve food sector sustainability. This study proposes sustainable FW management for Garki and other areas.

1.11 Chapter summary

In summary, it is clear from a review of the context presented in this chapter that, despite the growing acceptance of the volume and the impact of the FSS and FW, the scholarly work completed to address this issue with attention to multiple stakeholders' roles in the pre-kitchen, kitchen, and post kitchen is scant. However, few studies have examined FWL irrespective of the sector in Nigeria and the Garki district in the Abuja area, focusing on the upstream of the SC. Thus, this research study contributes to the body of knowledge by adopting stakeholder and practice theory in its analysis of FW management in the FSS. The following chapter provides a framework for the identification of FW and the management of waste in greater depth by investigating the source and approach to mitigation in order to facilitate the sustainable reduction of food waste.

Chapter 2 Literature Review-Food waste in the foodservice sector

This chapter examines existing academic research on food waste (FW) in the food service sector. The purpose of the literature review is to increase the understanding of current literature on FW in the food service sector. This is achieved by identifying routes for waste, exploring ways to reduce FW in the sector, and identifying a theoretical basis on which to further investigate stakeholders' theoretical knowledge based on empirical data. The section initially considers existing studies on FW globally, reviews African publications, and then conceptualises FW in the food service sector. It further classifies FW, identifying the root cause of food waste generation, types of waste, and ways to specifically control FW, considering the management of FW from the various stakeholders' perspective of the sector.

2.1 Definition of FW

The issue of FW has gained widespread recognition in recent times. Various stakeholders have paid attention to waste generation and prevention within diverse business settings (Gustavsson et al., 2011; Charlebois & Hughes, 2015) and academic, political, and public contexts. Waste is difficult to define due to its complex composition (Williams, 1995), and a universally acceptable definition is lacking (Lebersorger & Schneider, 2011). This poses a challenge to the comprehensiveness of the study of the quantification of the issue of FW (Buzby & Hyman, 2012). However, academics seek to provide a working definition (Table 2.2).

Some definitions include the use of food initially provided for human consumption for   non-consumption purposes (Dhir et al., 2020); this is also referred to as the disposal of edible food (FAO, 2014). This waste includes the edible and the inedible parts of food removed by the food SC which are useable through disposal (Bos-Brouwer et al., 2014). Others, such as Filimonau and Coteau (2019), refer to FW as food primarily intended for human consumption which is later re-purposed, such as animal feed. The EU Waste Directive 2008 defines waste as: "any substance or

object which the holder discards" (Directive, 2008/56/EC), merely referring to waste as having lost its value for human use. Studies show that this definition has been criticised; it fails to consider the consumer's intention in its description of the waste, which could be subjective in the research of Filimonau and Coteau (2019).

Table 2.1 FW definitions

Author	Year	Definition
Filimonau and Coteau	2019	FW is defined as food which was edible at the time of disposal and spoiled food prior to being disposed of due to operational inefficiencies, and/or irresponsible behaviours of food providers and consumers.
Dhir et al.	2020	FW is described as the consumption of human food by animals, the diversion of food for animal consumption, or the dumping of edible food. It consists of edible and inedible food components that have been removed from the food supply chain and are recoverable or disposable.
Wu, Mohammed, and Harris	2021	FW refers to food that was created for human consumption but is lost or wasted at some point of the food supply chain. FW excludes animal feed and the inedible components of products.
Porral et al.	2017	FW most commonly means food that was purchased but not consumed and ends up in the refuse bin.
Beretta and Hellweg	2019	FW refers to food which was initially intended for human consumption but was subsequently diverted to a non-food use including animal feed or discarded as waste.

Source: Author's own

Waste cannot be total because when it loses its value to one individual, it may be valuable to others (Filimonau & Coteau, 2019); the definition therefore depends on its usefulness to a different individual. Hence, waste is subjective and conditional, subject to the current state of technology,

the environment, and the political climate (Bontoux & Leone, 1997). FW is significantly different to food loss (Papargyropoulou et al., 2014).

Table 2.2 Food waste and loss definitions used in this study

Term	Definition	Drivers	Sectors included	Examples
Food loss	Decrease in edible food mass along the portion of the supply chain which directly becomes consumable human food.	- infrastructure inadequacy - Caused by climate and environmental factors - Standards for quality, aesthetics, and/or safety	Production, post-harvest, and processing	- Edible crops left in the field - Food wasted as a result of inadequate factory-to-supermarket transportation infrastructure - Food is contaminated during processing
Food waste	Food intended for human consumption which humans reject or do not consume. Includes food which was still edible at the time of disposal, and food which had gone bad prior to disposal.	- decisions made by businesses and consumers - Standards for quality, aesthetics, or safety	Retail and consumer	- Plate waste - Food spoiled as a result of inadequate storage - meals produced but rejected in food service establishments due to lack of demand

Source: Author's own (adapted from Thyberg, K.L., Tonjes. D.J., 2016)

'Food lost' refers to the loss or decline in food quantity or quality initially intended for consumption but not eaten by people, or lost economic value, nutritional value, or food safety (Filimonau & Coteau, 2019). As mentioned earlier with regard to FW, this research focuses strongly on the SC's downstream of the foodservice sector where FW is a frequent occurrence, specifically the kitchen area.

Reducing wasted food is a crucial element in the development of a sustainable food system (Quested et al., 2011); it has the potential to impact significantly on increasing food security (Priefer et al., 2016; Gustavsson et al., 2011), thus it is essential to consider increasing the effectiveness of the food distribution system. FW is classified into three forms in this study: avoidable, unavoidable, and potentially avoidable (Section 2.2).

The 2011 FAO Report from the Food and Agriculture Organization of the United Nations (FAO) contends that an estimated one-third of edible food is wasted around the globe and in the food SC annually, which accounts for an estimated 1.3 billion tonnes of FW (FAO, 2011; Gustavsson et al., 2011). FW occurs at various points of the chain, from primary production in agriculture, over-processing industries and trade, through to private households (Niehof & Wahlen, 2017). However, food loss is caused, whether by a flawed system or individual carelessness (Ju, 2017), this study examines waste irrespective of how it occurs. It is estimated that between 25% and 50% of food lost along the SC is wasted (Mena et al., 2011; Green & Johnston, 2004; Nellemann et al., 2009), although it is difficult to quantify this when considering consumer-level waste generation ((Heller et al., 2019). This waste is a huge global issue for a number of reasons. Firstly, millions of people worldwide face the challenge of hunger, which poses a moral question (Mena et al., 2011; Henderson, 2004; Stuart, 2009), leading to a food crisis (Nellemann et al., 2009). Secondly, environmental repercussions are related to the inefficient use of natural resources such as water, energy, and land, such as deforestation and land degradation (Nellemann et al., 2009; Stuart, 2009).

In addition, pollution is generated by refuse disposal, which releases methane, a greenhouse gas, in landfills (Griffin et al., 2009; Hogg et al., 2007; Stuart, 2009). Lastly, wasting food has economic consequences (Evans, 2011; Morrissey & Browne, 2004) which eventually impact all firms and individuals involved in the SC, including the end consumer (Ventour, 2008; Papargypoulou et al., 2014). As a result, the debate on FW has already drawn the attention of researchers, governments,

non-governmental organisations (NGOs), and significant players in the SC, including agriculture, food manufacturing, packaging, retail, and catering. FW is strongly associated with the negative factors of undervalued costs and is underreported (Binyon, 2007).

Hence, there is a need to explore this research area in order to understand the causes and routes in which waste occurs in the sector to suggest ways of minimising waste through the stakeholder's knowledge and firms' capabilities. In view of the importance of the issue, research has focused on waste generation and refuse courses in the SC from various perspectives and at specific stages of the chain, such as agriculture (Griffin et al., 2009) and consumption (Filimonau & Coteau, 2019). This research study aims to address the significant gap in waste by both identifying the root causes of waste and also accessing FW in the foodservice sector, such as hospitality, catering, restaurants, cafeterias, correctional centres, hospitals, and schools (Halloran et al., 2014), thereby proposing solutions to minimise it. FW should not be generalised; it should focus on contexts (Wahlen & Winkel, 2017; Aschemann et al., 2015). Foodservice is an appropriate subject for this thesis due to its role and impact on food sustainability.

Therefore, this thesis assesses and explores the role of stakeholders' orientation in the improvement of firms' efficiency to minimise FW. Food supply efficiency at each stage of the SC is crucial, as demand for food is expected to increase by 50% between 2009 and 2030 (Evans, 2009). The rise in population requires that the food sector continues increasing production and appropriately distributing sufficient food needed for consumption.

Research into the food sector has not been sufficiently carried out and has received a limited amount of attention from academics and practitioners. This under-explored area poses significant challenges for the sector and its players are seeking to understand the direction in which it is heading. Reducing waste across the SC is a primary target to ensure global food security. As mentioned in the preceding chapter of this research, waste is prevalent at each stage of the food

SC (Porral et al., 2017; Mena et al., 2011), with some of the FW stages receiving a higher level of attention during a period of waste generation (Mena et al., 2011).

Prior research indicates that consumers are the world's most significant contributors to the quantity of FW generated (Engstrom & Kanyama-Carlsson, 2004; Griffin, Sobal & Lyson, 2009; Pellegrini et al., 2019) in different economic sectors. The relevance of waste in the environment had led to some entire textbooks being devoted to waste in agriculture (WRAP, 2007; Griffin et al., 2009) and others to food manufacturing (C-Tech Innovation, 2004; WRAP, 2007). The quantity of waste is important, not only because it represents a financial loss for households, but also because it wastes natural resources and impacts food supply, which has a huge influence on developing nations (Stefan & Pincovschi, 2013). The literature also examines the main reasons for the generation of FW during distribution and the various types of waste which reduce firms' performance.

For this reason, various approaches, such as the Japanese approach of classification known as MUDA, address this issue. MUDA defines eight causes of waste, specifically: over-production, inventory, defects, motion, waste and scrap, waiting, transportation, and skills (Vaněček et al., 2018; Filimonau, Fidan, et al. (2019). Other researchers cite inappropriate packaging, poor handling and transportation, and forecasting and storage errors (Mena et al., 2011; De Steur et al., 2016). This research constructs FW in the foodservice sector to determine the waste route and identify its cause from academic studies. This approach is intended to minimise waste using stakeholder theory as a strategy to limit the volume of FW generated (Kilibarda et al., 2019) and to improve food supply efficiency.

A decrease in FW can be achieved in various ways, firstly by developing awareness among individuals of the application of fair food system practices and responsible behaviour and by involving critical stakeholders who have experience in developing and implementing policies (Janjic et al., 2019). Furthermore, food service firms should create a campaign and awareness of

FW and its impact on society. This function can be achieved through efforts by the various multi-stakeholders to harness and develop the available resources and improve the environment. Therefore, this research contributes to the body of knowledge by offering a critical and analytical account of waste in foodservice and discussing ways to reduce it, in view of the actors' role in the sector.

2.2 Classification of food waste

Food waste has been defined within the context of this study based on academics' different views (Section 2.3). Hence, it lays a foundation for the comprehensive classification and knowledge of the concept. Nevertheless, it is essential to expand on the understanding of its category; this classification provides a better grasp of the degree to which strategies can be formulated to prevent FW. Academics argue that food is different based on the diverse cultural contexts in which it occurs (Liu, 2014). There is no agreed method of collecting data on waste or loss quantification, although the evidence available shows that various definitions and classifications have been used to address waste or loss classifications. As such, previous studies carried out are not comparable to the current one (Lebersorger & Schneider, 2011).

Various efforts have been made to provide an acceptable general description of FW. Academics such as (Lévesque et al., 2022) advance an explanation based on FW studies; this is graded into three subclasses: avoidable, partially avoidable, and inevitable. This study adopts the classification by Dhir et al. (202), which defines waste threefold as: (i) avoidable, (ii) unavoidable, and (iii) potentially avoidable. Avoidable waste means that food good for consumption at a particular time and has become unconsumable (inedible) at disposal due to its deterioration (Dhir et al., 2020).

Unavoidable FW refers to food, which is unfit and, in reality is not edible. This category includes meat bones and fruit skins. Potentially avoidable FW applies to a specific waste occasionally consumed, with exceptions including potato skins (Papargyropoulou et al., 2014). Hence this

classification provides insight into the understanding of the possibilities of FW prevention. Therefore, this study focuses on a firm's stakeholders in the form of owners, managers, staff, policy, and opinion makers, taking responsibility for the reduction of FW, specifically, in the case of the FS sector and Garki districts.

2.3 Existing research on FW

Several studies on FW have been published in recent years; some take a quantitative approach, generally by seeking to find out where and why FW waste is generated, and in what quantities. For example, according to research conducted in the United Kingdom (UK) (WRAP, 2013a) based on literature reviews and surveys, some 23% of food purchased is wasted in restaurants, while slightly lower rates of FW are found in the health and education sectors at 18% and 17%, respectively. A separate study (WRAP, 2013b) with a smaller sample size of 19 catering facilities finds that FW was mostly caused by incorrect preparation at 45% and food abandoned by clients ('leftovers') at 34%.

As part of the 'United Against Waste' initiative, a separate study analyses the proportion of FW in 29 professional kitchens in Austria (UAW, 2015). Canteen kitchens generate the most waste, with a loss ratio of 29%; this waste consists primarily of leftovers or unserved items ('serving waste'). Hotels and restaurants, on the other hand, have slightly lower rates at 15% and 19%, respectively. The majority of FW at these restaurants results from production losses and leftovers rather than by service waste. Two further case studies (Eriksson et al., 2017) from Finland and Sweden reveal comparable results in terms of the causes of FW in restaurants and canteen kitchens (Silvennoinen et al., 2015).

Although a credible database for the quantification of FW has been established, important methodological constraints persist. Schneider (2013) highlights the widespread inaccuracy of

statistics about FLW. The author claims that the existing contradictory usage of definitions renders a comparative analysis between regions and segments of the FSC complex. In contrast to quantitative research, qualitative research focuses on organisational processes with the goal of identifying the major causes of FW and then working out how to reduce it (Heikkila et al., 2016). For example, expert workshops highlight eight criteria for the management of restaurants and public catering services with fewer FW. The study underlines the importance of societal standards, the development of professional skills and expertise, product quality, and dependable communication channels with suppliers, consumers, and other staff members. Papargyropoulou et al. (2016) contend that other factors have an impact on the generation of FW including issues in organisational processes such as uncertainties in forecasting customer numbers or internal communication struggles, as well as different consumption patterns based on disposition and cultural sensitivity.

Report asserts that a large number of guidelines (Creedon et al., 2010), practice-oriented (Nisonen & Silvennoinen, 2020; ReFED, 2018a; ReFED, 2018b; Hennchen, 2019), and some other best-practice examples (Sundt, 2012) have been published; it appears that providing information in both quantitative and qualitative research traditions is key to effecting change. The stakeholder network 'ReFED: Rethink FW through Economics and Data', which provides solutions for businesses to reduce FW, is an excellent example of this. ReFED (2018a, 2018b) suggests a solution matrix for the FSS in one of their most recent papers. Prevention methods are proposed and assessed for their predicted viability and financial impact. According to the research, menu planning and increased manufacturing efficiency based on waste audits, and more accurate purchase of commodities are the areas with the greatest opportunity for improvement. In the United Kingdom, research on the quantification of FW in the foodservice and hospitality sector (WRAP, 2013a) includes an entire chapter on preventative options, ranging from demand forecasting to waste monitoring measures.

In Germany, the 'Lebensmittel Abfall Vermeiden' (LAV) initiative at Münster University of Applied Sciences offers checklists, practical tips, and other information resources for managers in the catering industry. The German Federal Environmental Agency has recently published a study in conjunction with the German Hotel and Restaurant Association (DEHOGA), on avoidance measures for this sector (Fink et al., 2016). With the support of practitioners, suggestions for cost-cutting measures in the kitchen's planning, purchasing, stock keeping, preparation, and serving processes have been produced. The recommendation focuses on training (Priefer et al., 2016; Derqui et al., 2016; Gao et al., 2021), with programmes designed to increase employee knowledge and a variety of practical assistance measures.

2.3.1 Research on stakeholders' views of FW

The purpose of this study, in common with the preceding qualitative studies, is to identify the causes of FW and to recommend ways to prevent its continuous generation from the stakeholders-practice perspective. The findings show that a general lack of knowledge causes FW issues, challenging the meeting of customers' expectations, along with the unattractive nature of food (Betz et al., 2015; Falasconi et al., 2015), and the integration of monitoring activities into work routines. Although stakeholder engagement studies are essential for the development of a solid inter-disciplinary network to manage waste (Joseph, 2006), in the case of FW, the food supply chain, city planners, NGOs, educational institutions and teachers, store owners, and politicians are all stakeholders. Researchers in this industry advocate FW solutions as a synergistic effort on the part of governments, stakeholders, and merchants (Aschemann-Witzel et al., 2015). Calvo-Porral et al. (2017), for example, propose leveraging marketing to reduce FW and the establishment of a clear connection between consumer behaviour and purchasing habits in industrialised nations (Calvo-Porral et al., 2017). Despite recent applications of social marketing to environmental concerns, these indicate their potential application to the problem of FW (McKenzie-Mohr, 2011),

there is little research on social marketing published in peer-reviewed scientific literature at present. Academics' compilation of FW intervention efforts reveals insufficient stakeholder participation (Hodgkins et al., 2019). There is a need to extend research in this area, because although it has been covered in recent studies, it is insufficient.

To date, the literature on FW demonstrates a particular 'behavioural bias', which to some extent extends to studies arguing with a theoretical practice vocabulary. The focus is primarily on stakeholders and their decision-making when examining kitchen procedures and giving recommendations for the enhancement of business operations. FW can be reduced to the explanatory element of humans lacking the knowledge to form better judgments in its most simplistic version. As a result, it is expected that raising awareness and providing information to stakeholders will automatically promote changes in particular behaviour patterns, leading to increased food efficiency.

The focus of enquiry switches from stakeholder-centred analysis, and notably, stakeholders' deliberate decisions, to practice when using multi-stakeholder-practice theory. This shift helps researchers to develop a more contextualised understanding of knowledge when researching the foodservice sector. This research analyses what this shift in viewpoint means in terms of approaching the problem of FW in new ways. In Chapter 3, this study's theoretical foundation provides a more extensive explanation of the element concept of practice as an intrinsic part of this research.

2.3.2 Existing studies on FW in Africa

Attempts have been made to document the food SC and how it operates in Africa in general, and also specifically investigating the food production and waste which are generated within the value chain. Ugonna et al. (2015) investigate the tomato value chain in Nigeria, determining that some

1.8 million tonnes of fresh tomatoes are produced annually. Nonetheless, over 50% these are wasted due to inadequate storage systems, inadequate conveyance, and a lack of processing businesses. In developing countries like Nigeria, food loss and waste occur primarily in the production, processing, and distribution stages, due to a lack of infrastructure (Kilibarda et al., 2020). However, the FW is more evident at the chain's downstream level at the retail and consumption stages due to handling and consumption patterns (Aschemann Witzel et al., 2015).

These indicate the challenges faced within the food SC around the world, and in Nigeria in particular. In emerging economies, the problem of FW in the foodservice sector is even more acute (Papargyropoulou et al., 2019). Wen et al. (2018) conclude that China's foodservice sector generates half of the country's total FW.

Practitioners and academics have made little effort to improve SC efficiencies and performance for waste reduction, which is the area of interest of this research study. FW prevention is a critical aspect of a firm's sustainability strategy (Silvennoinen et al., 2015) and can improve, especially with a high priority component (Parfitt et al., 2010; Hodges et al., 2011). There are concerns about the impacts of FW throughout the world because the issue implies increasing poverty, hunger, and poor health conditions for growing populations.

Despite all these challenges, little has been done to avoid and/or reduce this waste. Therefore, firms need to be innovative, offering creative ideas to change the sector's narrative in order to impact the economy. Innovation in today's world requires stakeholders to adopt internal and external resources to firms' advantage. Firms have continued to innovate and seek solutions to solve their business concerns, proposing innovative ideas to stakeholders who are familiar with the sector's operations. The growing global competition among foodservice firms is also evident in Africa and Nigeria. The volume of FW generated and its impact on firms and sustainability call for it to be addressed in a different way.

There appears to be limited research on stakeholders' roles and how these influence firms' outcomes, performance, and waste reduction in Africa. The sustainable coordination and implementation of stakeholders' policies required for business purposes and poor infrastructure remain significant barriers to a full knowledge search in the continent of Africa (Adeyeye et al., 2018). Small firms in Africa have received insufficient attention compared to their role in developed countries like the UK, where 98% of businesses are SMEs. Therefore, much is unknown about how FW is generated and ways to reduce it in the Garki district area, which is also the case globally. Therefore, this study adds to the body of knowledge because no known research study investigates FW reduction from a multi-stakeholder and practice perspective in Garki districts, FCT Nigeria.

2.3.3 The FW issue in Nigeria

In recent years many initiatives have been launched by governments across the globe regarding FW and how it affects society. These ideas have raised the profile of FW, including nutritional safety, environmental impact, destruction of resources, and sustainable growth. In Nigeria, policymakers have openly joined the growing concern and debate around FW. Chief Audu Ogbe, Nigeria's Federal Minister of Agriculture, shocked his audience and millions of starving Nigerians in a public presentation in June 2017 when he admitted that 30% to 40% of the significant parts of foods produced are ultimately wasted, costing USD$750 billion per year. UN figures show that more than 14 million people in Nigeria were categorised as undernourished in 2016 (FAO 2017, Owoo 2020) and 25 million in 2018 (The World Bank, 2020); the increased impact of waste requires urgent attention. The government has made several efforts to tackle FW, such as holding round table discussions with organisations in the private and public sectors. Although the government and other institutions recognise the volume and impact of FW on the Nigerian population, there is continued starvation, loss, and waste of food. Those involved in food

production have not done enough; government effort has made no significant impact in tackling FW. For example, at no time has the institution documentarily recognised the sources of FW. Hence, this study investigates FW generation and ways to reduce it, especially in the foodservice sector in the Garki district area of Abuja, Nigeria.

This study does not seek to consider the entire country, but it does focus on a specific geographical area due to the concentration of various food stakeholders. FW generation is well known to firms, the government, customers, suppliers, the local community, and other associations. Academia, the media, and activists are directly and/or indirectly engaged in the various activities of canteens, cafeterias, correctional centres, hospitals, and schools.

For example, the app 'Chowberry' is an innovation which links people in Nigeria to supermarkets for food which would have normally ended up in the bin (BBC, 2018). Nigeria has tried to coordinate activities through private sector collaboration; for example, with 35 retailers, NGOs, and other organisations. Amara Mwarikp, the Director of public policy of the Shehu Musa YarAdua Foundation, an organisation which also works for food security, says: "We have no alternative but to innovate our way out of this dilemma". The United Nations (UN), through its partners' food and agriculture organisation (FAO) and environmental programmes, urges countries, including Nigeria, to address FW issues and to be concerned with the risk to food security and natural resources.

Reduction in FW might not be achieved without firstly identifying and understanding the reasons for its emergence in the food SC (Kilibarda et al., 2019), in this case specifically the foodservice sector. Therefore, looking at the rate of waste and the situation described by relevant stakeholders in Nigerian society's public and private sectors, it is essential to address these challenges and advance recommendations for ways in which to reduce waste within the sector. Most studies and investigations of FW from an academic perspective consider the courses and drivers from diverse

segments (Silvennoinen, Nisonen & Pietiläinen, 2019; Dhir et al., 2020). In this study, the FSS is the focus area, in which the majority of the post-harvest FW is generated. Additionally, the majority of these studies focus on a single country. To some extent, they provide a detailed and in-depth analysis of their focused context. This study limits its focus to Nigeria following this pattern, although its findings may be applicable to another domain.

2.3.4 Uniqueness of Nigeria context

There have been studies that argue that FW, rather than food loss, occurs in developing countries; this has already provided a bias in looking at the regions' contribution to FW; additionally, the majority of studies conducted were in developed countries (Papargyropoulou et al., 2014; Kilibarda et al., 2019; Rodgers et al., 2015; Filimonau & de Coteau, 2019), drawing on their findings to enrich the literature on FW generation and mitigation and further the discussion on FW management within the FS sector. The large numbers of samples and approaches used in contemporary studies favour developed countries and clearly apply to the day-to-day activities of these developed countries such as Finland, China, and France (Silvennoinen, 2015; Dhir, 2020). Even though these studies provide insight and understanding of FW generation and strategies to reduce it, the same result cannot be directly applied to the Nigerian context.

In developing countries such as Nigeria, the uniqueness of FW management practises has not been properly documented in the consideration of her business's environmental cultural practices, resulting in the continued generation of waste and the lack of a best practise approach to FW mitigation. In Nigeria, there is no evidence of any global FW management practices that have been successfully applied; the lack of infrastructure to help manage FS operations, the lack of specific market research to understand why FW occurs and ways to reduce it, and the lack of clearly defined roles of the FS stakeholders from the Nigerian perspective have hindered the improved performance of the sector. For instance, in Nigeria, there is no punishment for practices leading to

FW generation. Therefore, in the absence of these, there is a need to understand the behaviours that lead to FW and how they can change. Hence, the need to conduct research on the causes of FW and how this can be reduced from the view of the market actors (those who perform the day-to-day activities within the specific market domain).

Table 2.3 Recent studies analysing FW and geographical region

Author	Segments of the FSC addressed	Description and Methods	Geographical coverage	Classifying FW cause or drivers
Kilibarda et al. (2019)	Hospitality sector	Review paper of food waste management and recommendation of waste prevention.	Serbia, Belgrade	No
Rios and Meier (2018)	Foodservice sector	In 2015-2016, 110 semi-structured interviews were conducted in two rounds to examine the interrelationships between foodservice provisions and waste management advancements.	Swiss	No
Silvennoinen, Nisonen and Pietiläinen (2019)	Foodservice sector	The creation and sources of FW in outlets, as well as methods for preventing the overproduction of food and buffet line waste, were investigated, as was FW data.	Finnish	
Heikkilä et al. (2016)	Foodservice sector	A deeper understanding and clarification of the complex problem of FW is provided. During three participatory seminars, research data was gathered for workers from three separate catering companies in Finland.	Finland	Yes
Wu et al. (2021)	Food services (catering)	Based on data collected from 32 firms in Wales, UK, the primary causes of foodborne illness (FW) in the catering industry are considered.	UK	Yes
Gao et al. (2021)	Food services	A questionnaire and qualitative research were used to analyse and identify important concerns of FW and to identify viable solutions for the food service sector to minimise FW. 228 questionnaires were collected, and 51 representatives from 19 businesses and other organisations attended a subsequent workshop.	China	Yes

Source: Author's own

Having established the basis for an understanding of food waste in Nigeria, this study investigates how the concept of food waste has been addressed in other developed domains where substantial research has been conducted. The next section provides a detailed explanation of foodservice, which helps to show how food waste in food service differs from that in other parts of the supply chain. Additionally, Table 2.3 shows how food waste has been investigated in the context of food services to ascertain the level of waste generated and how this occurs; these studies focus on the role played by the different stakeholders to understand the root causes of FW and identify possible solutions.

2.4 The food service sector and FW

Foodservice establishments are businesses which offer ready-to-eat meals and snacks, such as food away from home. This category comprises full-service restaurants, quick-service eateries, caterers, cafeterias, and other establishments which prepare, serve, and sell food to the general public for a profit or with government assistance (Saksena et al., 2018). The 'eating-out-of-home' sector is another popular phrase for the FSS, and this might help to clarify what kinds of outlets are included and excluded. The FSS, like households, is located downstream within the food supply chain, and both are anticipated to produce considerable amounts of FW (FAO, 2011; Stenmarck et al., 2016).

Current demographic and consumption trends also indicate an increasing urban population and a growing FS sector (Knorr et al., 2018; Satterthwaite et al., 2010). This could increase the number of outlets within the FS, as well as the amount of FW produced and is therefore significant in terms of economic and social value. It is also stated that one in five meals are consumed in the industry (IRi worldwide, 2017). The FSS is defined by the European Commission's Statistical Classification of Economic Activities in the European Community (NACE) as: "establishments or actors providing complete meals or drinks fit for immediate consumption, whether in traditional

restaurants, self-service or take-away restaurants, whether as permanent or temporary stands with or without segregation" (European Commission, 2006).

The fact that ready-to-eat meals are available, rather than the type of facility which provides them, is decisive (EUROSTAT, 2008). It is essential to remember that, as with all structural business statistics, this definition and category only applies to businesses whose primary activity is providing food or beverages. Meals and beverages may represent a large secondary activity, such as in sports stadiums, cinemas, or recreation parks, and are included in businesses which offer food and drink to complement their core industry, if separate enterprises do not operate these. As a result, pinpointing and obtaining specific data from government sources to assess the size of this sector can be challenging.

The FSS, on the other hand, is undeniably important to any national economy. Small to medium-sized businesses which provide food for various meals make up the foodservice sector. Due to underlying variables such as types of consumers targeted, seasonality, whether food is a primary or secondary business, the size of the institution and operational hours, and the type of meals supplied, food service establishments come in a wide variety of settings. As a result, a solution which works to reduce FW in one location may not be universally effective. A method which successfully reduces FW for lunch in one establishment may not be beneficial for breakfast in another. Some of the most well-established food service locations are work canteens, restaurants, hotels, preschools, schools, secondary schools, correctional facilities, and hospitals.

Some of these organisations operate in the free market, but others fall into the category of public catering, which means that taxes and other government revenue sources partially or completely sponsor their activities with subsidies or government backing. In certain circumstances, companies are introduced through the procurement process to run a hospital kitchen, and in others, a public catering organisation manages everything. Individuals organise the majority of public catering in

Nigeria and the Garki districts as a family business, a partnership, or firms owned by various government sectors and their agencies; these are responsible for preschool and school meals and catering for diverse members of the public who choose to patronise their services. FW is dominant within the foodservice sector, which generates a high volume of waste. The next section of this thesis explores FW in foodservice.

2.4.1 Food waste in foodservice

After homes and food processing organisations, foodservice supply is the third greatest contributor to global FW (FAO, 2019). However, the exact size of this impact was unknown until recently because no worldwide FW estimates were available (Filimonau & Ermolaev, 2022). Instead, estimates were made using regional (FUSIONS, 2016) and/or country-specific numbers (WRAP, 2020). While these data are useful, they do not reflect the complexity of the incidence of FW in the worldwide foodservice industry. Foodservice supply, for example, makes the highest contribution to China's overall FW due to different socio-cultural variables (Wen et al., 2015).

As a result, it may be inappropriate to use statistics from China, or any other area or nation, to reflect FW in the global foodservice context. UNEP (2021) has reviewed existing research to provide FW statistics for the foodservice industry of 235 countries and territories in order to solve the problem of insufficient and inaccurate global estimates. According to UNEP (2021), the global foodservice business generates approximately 244 metric tonnes of food waste annually, which is equivalent to 26% of the food waste eaten globally or 19% of the food waste produced along the global food supply chain, based on data from FAO (2019). The national foodservice sectors of China (65 metric tonnes), India (38 metric tonnes), and the United States (21 metric tonnes) waste the most food, contributing 27%, 16%, and 9% of global FW, respectively.

Despite being the first estimate of FW in the worldwide foodservice industry, UNEP (2021) notes that this is only an estimate, recommending that it is used with caution. This necessitates the need

for empirical, ground-level observations on the breadth of FW, particularly in emerging and transitional countries like Nigeria, in order to understand its context.

The post COVID-19 pandemic events show that the foodservice sector has seen an improvement in terms of customers' patronage and increase in sales . This is likely to continue to be the case in many geographical areas worldwide, with a meaningful growth rate (Pirani & Arafat, 2014). This is expected in all countries worldwide, irrespective of geographical location; the anticipated expansions in this sector's activities are likely to result in a massive waste generation throughout the SC. In different forms, more waste, including FW, is consequently produced (Bilska et al., 2020). In hotels, schools, and restaurant canteens, FW is produced during storage and processing in cooking facilities, in the dispatch area (buffet), and in the consumer room, in the form of leftovers.

Therefore, practice for better waste management is inevitable and is likely to lead to significant savings for firms. Again, the firm's location and how waste management is coordinated, regulated, and implemented within the firm's policies will determine the outcome (Pirani & Arafat, 2016). The issue of waste management in the foodservice industry has remained unresolved for many years (Kilibarda et al., 2019), including in the Garki area, resulting in ongoing debate and issues. As a result, there is a greater need for food management control, most notably the amount of FW resulting from its handling during preparation and storage, as well as the likelihood of reusing food which is prepared but not sold (Bilska et al., 2020). Therefore, FW refers to unwanted and consequently disposed of food, such as the leftovers from guests' plates and vegetable peelings which are produced during cooking (Pirani &Arafat, 2016).

It is necessary to improve FW's current global practice in the food service industry (Filimonau et al., 2022). Waste generation within food services is considered to exert a significant impact on the environment (Bohdanowicz, 2006). Considering the global volume of substantial noticeable waste

and placing it into the foodservice context provides information on the sources of waste. Some studies in other geographical areas, such as Denmark and the UK, provide figures on the volume of FW and its impact on their geographical location and the world. This sector accounts for one-third of all food consumed in Denmark (Marthinsen et al., 2012) and accounts for 50% of Denmark's waste (Marthinsen et al., 2012; Curry, 2012). UK figures show that 920,000 tonnes of food are wasted annually in hospitality and industry outlets, 75% of which could be avoided (Parfitt et al., 2013).

Nigeria and most developing countries (Akanwa & Joe-Ikechebelu, 2019) cannot be excluded from the global FW crisis. The waste reduction challenges are primarily due to inadequate technologies, infrastructure, and skills to manage the flow of resources throughout the food SC and food service outlets. FW is believed to be dominant in developed countries (Kilibarda et al., 2020). Academic criticism of FW focuses on how food is produced, processed, and consumed in the foodservice industry and thus, how to reduce FW (Pirani & Arafat, 2016). However, with the growing debate regarding limited substantial global studies to provide solutions to FW generation, the United Arab Emirates (UAE)'s FS sector has made noteworthy progress in developing policies from the political perspective in reducing waste through the tourism cultural authority (TCA Abu Dhabi).

The following section provides evidence of FW generation within the foodservice sector, focusing primarily on waste generated at pre-kitchen, kitchen, and post-kitchen stages.

Table 2.4: A review of selected studies focusing on FW in the foodservice sector

Key studies	Author	Main objectives	Methods	Key findings	Limitations	Further research
Management of FW reduction in hospitality	Kilibarda et al. (2019)	Identifying and recognising the causes of FW and its emergence in each segment of the food chain	Paper review	Food wastage impacts global sustainable development	Empirical study is required	The need to integrate FW management into other business areas such as training
Elements affecting FW in the foodservice sector	Silvennoin, Nisonen & Pietiläinen (2019)	Examining the causes of its generation in restaurants and catering businesses	Qualitative study	Results show that some 20% of generated food is wasted in FSS, which has substantial societal repercussions	The case study has a small sample size, consisting of FS establishments in Finland	The need to measure and monitor the amount of FW in order to find novel ways of reducing it and proving the efficacy of the new solutions
Management innovation of FW in foodservice	Rios et al. (2018)	Investigating FW using innovation management and social constructivism	Semi-structured interviews	Study identifies that fewer businesses are active in innovating within the waste domain	The sample is limited to restaurant managers in Switzerland	To present tools and concepts for designing innovative waste management system practices
A systematic literature assessment and approach to framework creation for FW in hospitality and food services	Dhir et al. (2020)	Examining the position of FW literature in the hospitality and food services sector (HaFS)	Systematic review of the literature (SLR)	The study identifies key stakeholders as managers, staff, and diners	The focus of the study is restricted to the profit segment of FS which provides	To evaluate the framework with other variables

					dining away from home	
Studies on the patterns and causes of FW in hospitality and FSS: FW prevention insights from Malaysia	Papargyropoulou et al. (2019)	Examining the trends and causes of FW generation in the hospitality and foodservice industries	Mixed methods approach	FW constitutes a loss to the economic equal to 23% of the food's value		Additional study should use approaches, methods, and instruments from more diverse fields
Drivers and reduction solutions of FW in the Chinese foodservice business	Gao (2021)	Recognising and defining the key FW problems and finding possible ways to reduce FW in the foodservice sector	Mixed methods approach	Lacking FW measurement	Limited to staff opinions	FS businesses should influence more stakeholders at the up- and downstream of the SC via different approaches
Elements affecting FW in the FS sector	Heikkilä et al. (2016)	Explaining the complexities of FW and its origins in the fast-food industry	Qualitative study	Eight factors affecting the production and reduction of FW are identified	Focuses on a single factor (catering)	In the foodservice industry, there is a lack of understanding of the status quo, drivers, and FW solutions
Size and origin of FW: Case studies in the Finnish foodservice industry	Silvennoinen et al. (2015)	The project aims to estimate the amount and distribution of initially edible (OE) FW between various foodservice outlets	Quantitative study of 51 food outlets	In addition, the studies reveal that buffet facilities and overproduction are the primary causes of food waste	20% of the food handled and prepared in the industry is lost or discarded	Qualitative techniques and structured interviews with management, employees, and clients should be used

FW management in Shanghai's full-service restaurants: The perspective of top managers	Filimonau et al. (2020)	Aims to further the study agenda on FW in the foodservice industry by investigating it in a sample of restaurants in Shanghai, China	22 semi-structured interviews with top managers	Lack of engagement of consumers in FW mitigation	The study is limited to senior managers	Evaluation of effective FW mitigation policies in other countries and applicability to the Chinese context should be ensured
Enablers and interrelationships of FW management in the catering services	Wu et al. (2021)	Identifying the primary FW enablers and then advising managers on how to tackle fundamental causes by performing a cause-and-effect analysis	A multi-criteria decision-making method from 32 businesses	Identifies crucial waste enablers, including waste procurement and storage, processing, operating strategy, personnel, and consumers	Relates only to catering service	There should be investigation of the behaviour of consumers and managers from other cultures in order to facilitate the transferability of the results
A study of restaurant managers' attitudes towards zero waste	Principato et al. (2018)	Evaluating the characteristics related to restaurant FW by differentiating between kitchen-generated and client-generated FW	Collected information from 127 eateries in the regions of Lazio and Tuscany in Italy	Significant factors include the disposition of restaurant managers, the sorts of menus presented, and the size of the restaurant	Study is limited to managers	In-depth and qualitative interviews should be carried out with kitchen workers

Source: Author's owns

2.5 Key causes of FW in the foodservice sector and preventive approaches

Several studies identify the root causes of FW (Lebersorger & Schneider, 2014; Teller et al., 2018; Heller et al., 2019) such as value stream mapping (VSM) to understand waste in the food sector (De Steur et al., 2016). To make this FW route visible and recommend ways to reduce it, academics have developed means of measuring and understanding FW such as kitchen diaries, waste statistics, and waste stream analysis. These approaches have their own challenges and peculiarities in terms of over- or under-accounting for FW (Quested et al., 2011; Edjabou et al., 2016; Tucker & Farrelly, 2016), although they all provide valuable information on waste hot spots and their causes (De Steur et al., 2016). It is essential to understand how FW is produced, because successful FW management requires stakeholders to understand FW's amount and the route of this waste (Ai & Zheng, 2019).

2.5.1 Cause of FW in food services

In the majority of studies, researchers identify various causes of FW and how it is generated around food services, such as procurement and operation strategy, storage, processing, people, and the consumer (Ravandi & Jovanovic, 2019; Heikkila et al., 2016; Barkowitz et al., 2016; Pirani & Arafat, 2014; Reynolds et al., 2019; Papargyropoulou et al., 2016; Priefer et al., 2016; Sakaguchi et al., 2018). Other areas of FW include preparation, service, and consumption (Dhir et al., 2020). Academics contend that FW arises from overproduction, service issues, and plate waste (Sebbane & Costa, 2018), food menu, production methods (McAdams et al., 2019) and large size of dinnerware (Wansink & Ittersum, 2013), employees' skill level (Kasavan et al., 2019; McAdams et al., 2019) and size of food portion (Heikkila et al., 2016; Barkowitz et al., 2016). Wu, Mohammed and Harris (2021), present detailed causes of FW in a tabular form (Figure 2.1) identifying the levels at which this waste occurs and their possible causes.

FW sources in food services can be better categorised under two headings: re-consumer and post-consumer causes of FW (Baldwin & Shakman, 2012). FW occurs at different SC stages, from the point of supply to the after-service. FW cannot be avoided within the various food service outlets; therefore it is accepted to occur before and after food preparation. Studies on FW have dominated the FSS, representing a challenge to all stakeholders across all boundaries (Kilibarda et al., 2019; Rios et al., 2018), evidenced by the various contributions of academics.

FW has become noticeable at the pre-consumer stage in the procurement and storage of materials purchased (storage/purchase waste) and also at the phase of food preparation (preparation waste) and handling by kitchen staff (Baldwin, 2015; 2016; Pirani & Arafat, 2016; Kilibarda, 2019b). Post-consumer waste is produced as leftover FW, usually being the leftover food on a plate, and is categorised as food that the consumer requested and paid for which was subsequently not eaten (Costello et al., 2016). Overproduction waste may be regarded as post-consumer waste because it is food available but neither sold nor consumed due to excess production. (Costello et al., 2016).

Regardless of where FW occurs, the reasons for its production vary depending on the stage at which the waste is produced (Kilibarda et al., 2019). Non-compliance with good hygiene and manufacturing practices in the procurement and storage stage is a frequent explanation of FW generation during preparation (Kilibarda, 2019b). These processes provide for better handling of food, safety, and convenience. The implication of not complying with temperature regimes or inability is to enforce the FIFO (first-in-first-out) belief that rules can in fact lead to FW (Engstrom & Carlsson-Kanyama, 2004).

Indiscriminate ordering can lead to poorly-organised or bulk food procurement because stored food expires and it should be recycled if not used up (Baldwin, 2015). The food preparation stage usually produces inedible FW as a result of chemical processing. Authors argue that some

of the waste produced may be higher due to unskilled staff and/or ineffective kitchen equipment for food processing (Baldwin, 2015; Papargyropoulou et al., 2016; Filimonau, Fidana, et al., 2019).

In some cases, staff incorrectly estimate the expected numbers of customers and therefore overproduce food. Additionally, spoilage might result from overproduction (Garrone, Melacini, & Perego, 2014). This spoilage is the result of insufficient cooking (Charlebois, Creed, & von Massow, 2015) and serving abilities (Goh & Jie, 2019). Hence, multi-stakeholders in food service collaborations are required on the matters of the quantity of food to be produced, the expected number of clients needed before food preparation, and the entire management of the foodservice, from production to consumption.

Collaboration is an essential technique for mitigating FW; it has gained validity and urgency among stakeholders throughout the food supply chain (Govindan, 2018; Mena, Terry, & Ellram, 2014; Priefer, Jorissen, & Brautigam, 2016). This collaborative approach is based on stakeholders' realisation that waste occurs at all levels of the food supply chain due to the nature of its activities (Silvennoinen et al., 2019; Canali et al., 2017), and tackling the complex problem of FW necessitates multi-stakeholder engagement. Stakeholder-practice theory supports the analysis of stakeholders' handling to identify the many types of practice in which stakeholders participate across the food supply chain.

The requirement for good communication between and among a firm's actors (Graham-Rowe et al., 2014; Quested et al., 2013; Pirani & Arafat, 2016; WasteMinz, 2014; Sakaguchi et al., 2007) has been emphasised by numerous researchers (2018) in the FS, and particularly in the pre-kitchen (upstream processing, procurement, and storage), kitchen, and post-kitchen levels (consumption and consumer communication), where a large proportion of FW is frequently generated (Gao, 2021; Papargyropoulou et al., 2016; Kilibarda, 2019). Some academics argue

that buffet services generate substantial FW (Silvennoinen et al., 2012; Betz et al., 2015; Pirani & Arafat, 2016). This occurs because of non-adherence to the temperature level required to maintain food safety at buffet table service (Papargyropoulou et al., 2016; Sakaguchi et al., 2018).

Finally, waste is attributable to oversized portions of food (Sakaguchi et al., 2018), usually after food intake (Pirani & Arafat, 2014; Reynolds et al., 2019). Ingredients are also well-represented in high quantities due to the significant portion size of the food prepared, producing waste due to non-compliance with standard portion sizes. Waste here is caused by over-ordered plated food. Conclusively, factors responsible for FW in different food service outlets depend on the season, numbers of customers, the time of the week and days, and the routes via which waste is produced (Merchant & Cloy, 2017).

Table 2.5 Pre-consumer and post-consumer causes of FW

Pre-consumer	Post-consumer
Demand not known	Large portion sizes
Excess stockpiling	
Over-production of meal	Ineffective service model
Lack of adequate communication	
Workforce actions	
Unprofessional cutting skills	Customers' menu acceptance
Over-merchandising	
Food safety	

Source: Baldwin & Shakman (2012).

Interestingly, these authors concur on the types of waste and causes in several studies (Papargyropoulou et al., 2014; Steur et al., 2016; Vaněček et al., 2018). However, in developing countries such as Nigeria, FW has received limited attention and constitutes a challenge

(Tucker & Farrelly, 2016), as it does worldwide. This research proposes a construct based on studies which review the causes and possible approaches for the reduction of FW in the food service sector. It is essential to understand these elements to help reduce FW in foodservice outlets, monitoring its progress within the context of FW in the FSS. This study examines the pre-kitchen, kitchen, and post-kitchen operational phases of the sector and is empirically investigated (Filimonau & Coteau, 2019).

Stakeholders play a critical role within the operational phases of a business in eliminating FW. Relevant stakeholders such as staff, managers, and suppliers, along with public institutions, play a part in improving the procurement process at pre-kitchen level, taking into account forecast demand and ensuring that this is as reliable as possible, enhanced by effective stock management (Derqui et al., 2016; Baldwin, 2015). Studies show that an excessive amount of food which is processed is wasted because it is neither used nor eaten within a reasonable time (Filimonau & Coteau, 2019). Managers should prevent food spoilage by conducting a detailed stocktake with a foundation for a more reliable purchase. The kitchen stage enables the service actors to make essential decisions about handling, preparing, and serving food.

The actions of the firm's stakeholders, including owners, managers, supervisors, and kitchen workers, all help to minimise waste while achieving efficiency. FW reduction involves owners/managers planning a proactive mechanism for their clients at post-kitchen stage, implementing advanced food delivery approaches by use of technology and innovation, and opening businesses to a more effective FW management strategy.

Table 2.6 Studies of causes of FW in the food service sector

Levels	Causes	References
Procurement and storage	Difficulty in forecasting	Gao, Bao, Li, Liu, and Wu (2021), Santos (2017), Baldwin (2015), Papargyropoulou et al. (2016); Filimonau, Fidan, et al. (2019), Priefer et al. (2016),
	Non-compliance	Baldwin (2015), Kilibarda (2019b), Engstrom and Carlsson-Kanyama (2004), Papargyropoulou et al. (2016)
	Forgotten and spoiled food	Garrone, Melacini, and Perego (2014), Charlebois, Creedy, and von Massow (2015), Gao et al. (2021)
	Over-stocking	Baldwin (2015,2012), Derqui et al. (2016)
Processing	Strict regulation on safety and quality	Baldwin (2015), Kilibarda (2019b), Engstrom & Carlsson-Kanyama (2004), Gao et al. (2021), Filimonau and Coteau (2019), Gustavsson et al. (2011), Papargyropoulou et al. (2016), McAdams et al. (2019), Priefer et al. (2016)
	Excess preparation	Dhir et al. (2020), Derqui et al. (2016), Filimonau & de Coteau (2019), Papargyropoulou et al. (2016), Santos (2017)
	Lack of knowledge of cooking quantity	Dhir et al. (2020)
	Lack of equipment and tools	Baldwin (2015), Papargyropoulou et al. (2016), Filimonau, Fidan et al. (2019), Kilibarda et al. (2019)
Operational strategy	Inappropriate portion size	Garrone, Melacini, and Perego (2014), Sebbane and Costa (2018), McAdams et al. (2019), Wansink and Ittersum (2013), Heikkila et al., 2016; Barkowitz et al. (2016), Priefer et al. (2016)
	Buffet style leading to taking of excessive amount	Silvennoinen et al. (2012), Betz et al. (2015), Pirani and Arafat (2016), Gustavsson et al. (2011), Priefer et al. (2016)

	Large menus	Garrone, Melacini, and Perego (2014), Sebbane and Costa (2018), McAdams et al. (2019), Pirani and Arafat (2014), Reynolds et al. (2019)
	Poor waste management	McAdams et al. (2019), Derqui et al. (2016)
	Over-production	Sebbane and Costa (2018); Costello et al. (2016)
People	Staff mishandling	Baldwin (2015, 2016), Pirani and Arafat (2016), Kilibarda (2019)
	Miscommunication between management and staff	Govindan (2018), Mena, Terry , and Ellram (2014); Gao (2021), Papargyropoulou et al. (2016), Kilibarda (2019)
	Unskilled staff	Charlebois, Creedy, and von Massow (2015), Kasavan et al. (2019), McAdams et al. (2019), Filimonau, Fidan et al. (2019)
	Serving skills	Goh and Jie (2019)
	Attitude towards FW	Filimonau, Fidan et al. (2019), Dhir et al. (2020), Gustavsson et al. (2011)
Consumers	Customers' attitudes, values, and behaviours towards food	Filimonau, Fidan et al. (2019), Dhir et al. (2020), Coskun and Ozbük (2020)
	Random customer purchase	Baldwin (2012), Charlebois et al. (2015), Filimonau, Fidan et al. (2019)
	Unattractive nature of food	Betz et al. (2015), Falasconi et al. (2015)
	Over-ordering	Merchant and Cloy (2017), Gao et al. (2021)
	Leftovers	Costello et al. (2016), McAdams et al. (2019)

Source: Author's own (Extracted from Wu, Mohammed and Harris (2021)

2.5.2 Preventive approaches to the reduction of FW in foodservice

Waste management practices differ between countries around the world. These approaches have been applied to other waste issues; their application is also relevant to food, hence the techniques and concepts are shared. Waste hierarchy techniques are typically used for waste management because there is a preferred order of applications. Academics and practitioners

endorse the use of this approach as applicable; it is also found to be helpful by the European Union (EU) as it features in the EU Waste Framework. The hierarchy as presented uses its first three techniques, which are: 1. strict avoidance 2. reduction at source and 3. product reuse; this is a concept which aims to address waste prevention in order to reduce FW (Huhtinen, 2009, p.17). The essence and application of this technique is to provide waste management benefits for each specific type of waste.

A company has the management responsibility of monitoring food flow from the point of processing to where it is taken (Balser & McClusky, 2005). Firms are responsible for the elimination of any food surplus, which is an aspect of FW waste reduction and waste management (Papargyropoulou et al., 2014). Waste is dominant within the kitchen area, which is also referred to in this study as the operational phases of the food service (Filimonau & Coteau, 2019), i.e., pre-kitchen, kitchen, and post-kitchen (see 2.5.4 for details). Current FW management practices show benefits in the foodservice sector, both technically and in the literature (Filimonau & Coteau, 2019).

Any of these activities involve the updating of kitchen processes (cooking, meal preparation, and FW control), consumer awareness-raising programmes (Filimonau et al. (2020); Gao et al. (2021); Betz et al. (2015), the use of food recovery, recycling, and redistribution (Filimonau & Coteau, 2019; Dhir et al., 2020) strategies such as possible food donation (Papargyropoulou et al., 2014; Bharucha, 2018; Harvey et al., 2020; Sakaguchi et al. 2018), and the production and use of technologies to improve service operations (Filimonau & Coteau, 2019).

FW can also be reduced through multi-stakeholder collaboration (Derqui et al. 2016), while others recommend decreasing food size (Ravandi & Jovanovic, 2019; Priefer et al. 2016; Sakaguchi et al. 2018), which they claim decreases FW by 30%. Rethinking the buffet and using smaller serving bowls is a recommended strategy (Priefer et al. 2016; Silvennoinen et

al., 2012; Betz et al., 2015; Sakaguchi et al. 2018). Other words include FW management activities and Nudges, which refers to a signal used to remind other actors of their waste reduction role. To better understand the methods of reducing FW in the foodservice sector it is necessary to study the SC's operating phases where waste is produced (pre-kitchen, kitchen, and post-kitchen, see Figure 2.6) (Filimonau & Coteau, 2019).

The approaches to the management of FW provide opportunities for food availability and firm development in diverse ways; FW management offers benefits to the foodservice sector in the following three dimensions: environmentally, waste is avoided when food is appropriately managed because food is not deposited and landfilled where it will eventually rot and produce greenhouse gases. This prevention saves both space and a firm's resources which have been already used for processing, also reducing water consumption and forest devastation (Bell & Cerulli, 2012; Marthinsen et al., 2012). Further, if FW is used for composting purposes, this can improve the soil's fertility and its capacity to maintain nutrients (Regional District of Nanaimo, 2013). Economic benefits can be considered on both large and small scales, reducing disposal costs for various foodservice outlets and processors, and decreasing household food bills (Bell, 2012). Social benefits include the responsibility factor of not wasting edible material given the world's hunger. There is an even more significant and beneficial social impact when saved food is redirected to those in need with the aim of eradicating hunger.

2.5.3 Impact and challenges of FW in the foodservice sector

The effects of FW on the sector and its significance for sustainability and the environment have been examined by academics (Thyberg & Tonjes, 2016; Papargyropoulou et al., 2019; Dhir et al., 2020). In emerging nations, the challenge posed by FW to the foodservice industry is much more evident (Papargyropoulou et al., 2019). For example, global FW, including the emerging economy, represents a considerable amount of FW (Wen et al., 2018). The problem posed by

the growing amount of waste has been reported and accounts for 23% of the economic loss of food purchased (Papargyropoulou et al., 2019). Wang also contends that the economic consequences of hotel and catering industry (HORECA) pollution are twice the amount of arable land in China. This influence is even more significant in developing nations such as Nigeria, although there is no approximation of its FW output.

FW has significant adverse economic, environmental, and social implications (Papargyropoulou et al., 2016; Gao, 2021). FW was highlighted by FAO (2011) due to its effects on food safety and quality, economic growth, and the environment. Despite its importance, there is a lack of knowledge of the status quo, drivers, and solutions for FW in the FSS (Gao, 2021). There is a need to understand and address the impacts of FW in the food services sector and bridge the extant gap. Aschemann-Witzel et al. (2015) also highlight the way in which FW impacts the sustainability of the food sector (Silvennoinen et al., 2015) at social, environmental, and economic levels.

This research addresses the different impacts of FW on society and the threats it raises, such as adverse economic, environmental, and social impacts (Papargyropoulou et al., 2016) and food security (McAdams et al., 2019). These waste challenges are also a concern for food action organisations, which highlight the global cost implications of the impact of this level of FW such that USD$2.6 trillion is attributed to the different effects mentioned above. The social consequences of FW vary from rising food demand increasing food prices to considering how the reduction of FW may be an effective strategy for feeding the world's growing population. It is understood that approximately one-third of global food production is wasted, and that more than 800 million people suffer from chronic hunger. This estimate constitutes a significant step towards developing an understanding the social effects of FW (Chrobog, 2014).

Table 2.7 Global cost implication of the impact of FW

Impact	COST (US DOLLARS)
Economic impact	1 trillion
Social impact	700 billion
Environmental impact	900 billion
Total	2.6 trillion

Source: FAO (2014) Food wastage footprint (2014)

(i) Environmental impact

FW represents a waste of the resources required to create food, including water, land, and energy. Due to the non-consumption of the food produced with this water, one-fourth of the fresh water used in global food production is wasted (Kummu et al., 2012). The annual blue water footprint of global crop production is 723 km3 (consumed fresh surface water and groundwater), demonstrating the fact that uneaten plant-based FWs consume 174 km3 of blue water annually (Kummu et al., 2012). FAO (2013) estimates that FLW wasted 250 km3 of blue water in 2007, taking into account waste consisting of animal products.

In comparison, FLW wastes more than three times the annual amount of surface and groundwater. FW also exerts an impact on climate and biodiversity; its removal from landfill sites would exert the same positive gas emission contribution as taking 25% of all the cars traversing America's roads. Climate change, biodiversity loss, and the nitrogen and phosphorus cycles all place pressure on the planet's boundaries as a result of food production.

(ii) Social impact

An increasing food price relies on the fact that a lower price potentially represents greater food access for consumers (FAO, 2011). Furthermore, humanitarian and development goals can be

undermined by hunger (Global Food Banking Network, n.d.). According to the FAO (2013a), the social cost of hunger and malnutrition is high. These are pillars of human health and well-being which also represent physical and cognitive development; their implication is extra budgeting in order to improve the impacts exerted by FW. Human health can be affected by the poor state of solid waste management, significantly when the environment is contaminated by the disposal of untreated waste. A significant amount of FW is acknowledged to contribute to the proliferation of diseases (Tello et al., 2011).

(iii) Economic impact

FW impacts both producers and consumers. It indicates the loss of resources which have a cost to the producer, such as a fossil fuel for storage, processing, distribution, and/or any other type of energy utilised, water, labour, and raw materials, along with organisation and planning expenses (FAO, 2014b). Any waste throughout the SC and production chain is an expense for the producer, representing a poorly-managed resource. For the consumer, food waste represents a cost and loss of economic acquisition power for a resource that was not used or fully utilised (Ibid). It is also essential to acknowledge and consider the reasons for the impacts presented and why FW should be regarded as unethical behaviour. Throwing food away along the supply chain affects organisations, consumers, and all other individuals involved in activities associated with food management. The knowledge of the depth of the economic costs of wastage is likely to create behavioural change thus reducing waste. Saving money is documented as a driving factor in FW prevention behaviours (Graham-Rowe et al., 2014; Quested et al., 2013; WasteMinz, 2014). The next section examines the approaches to food management as a strategy to reduce FW.

2.5.4 Activities in the operational stages of foodservice

Pirani and Arafat (2014) conducted a survey from which they conclude that 44% of their sample organisations use equipment such as signs encouraging kitchen staff to minimise FW. This measure is to raise kitchen workers' awareness of the need for good manual handling to avoid FW due to the importance of food. The foodservice industry engages in a series of activities, mainly in food procurement, preparation, and consumption.

Figure 2.1 Operational stages of foodservice
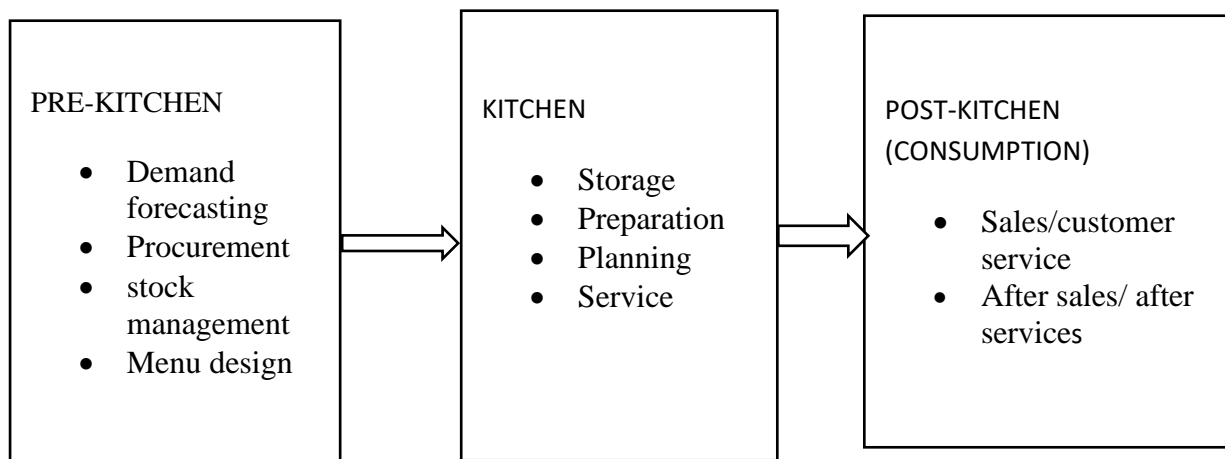
Source: Author's own

The kitchen area facilitates a series of actions which lead to the generation of FW, as kitchen activities are central to food handling. The minimisation of FW requires an understanding of both the pre-kitchen activities and market situation, which is based on knowledge required from information in the store. For example, the menu is planned before cooking, and likewise procurement is based on the needs of the kitchen staff. As demonstrated by the fact that food services generate the third largest amount of FW (FAO, 2019), the kitchen plays a variety of roles in FW generation or reduction. The extent of FW within the sector was previously unknown (Filimonau et al., 2022).

Furthermore, FW is dominant in the kitchen, where cutting, washing, use of ingredients, and service occur as a result of the movement and use of various handling techniques for cooking. There is much wastage at store level, in the meal's preparation and service. Hence, professional skills in cooking and handling resources are required in order to prevent waste. Customers also play a role in what happens after kitchen staff have provided food by serving customers.

The post-kitchen stage concerns the behaviour and attitudes of customers (Filimonau, Fidan et al. 2019; Dhir et al., 2020), as a significant factor in the management of FW challenges at the operational stages of the food supply chain. Food may be left uneaten, be thrown away, or become leftovers for a variety of reasons. However, waste is generated regardless of the cause. Gao et al. (2021) provide a detailed account of the drivers of FW within the foodservice sector. Therefore, FW managers need to understand their customers, staff, and other external stakeholders who participate in the pre-kitchen stage of the courses, teaching them how to prevent further waste. The information in Table 2.8 below is extracted from Gao et al. (2021), who provide details of a workshop discussion focused on the various drivers of FW within foodservice.

Table 2.8 Drivers of FW in the three operational stages of the food services sector

Groups	Drivers	Participants
Pre-kitchen: upstream processing, procurement, and storage	Overly strict/unclear raw material criteria (not acquiring those that are too little or too ugly), excessive processing waste upstream, or later abandonment due to not fulfilling requirements, particularly for restaurant chains.	Procurement managers and suppliers
	Inaccurate ordering (poor demand projection), resulting in the expiry of raw supplies that are not utilised	
	Not emphasising the consumption of food with an earlier production date	
	Standards and practices for food safety which are excessively stringent, including for imported- and for ready-to-eat food	
	Due to a lack of strong and clear laws on food donations, it is difficult to donate nearly expired, unused food.	

	Transporting fresh products, particularly in adverse weather and long distances	
Kitchen: Food preparation	Low staff capacity	Chefs and chefs' assistants
	Excessively stringent requirements for raw materials such as chefs' practices and/or kitchen routine	
	Food safety issues: quality issues	
	Effectiveness of central kitchen processing	
	Limited storage duration and excessive preparation	
Post-kitchen: Consumption and communication with consumers	Unstandardized plate size which makes it difficult for newcomers to estimate the volume of food	Owners, managers and/or communication officers
	No option for smaller portions of the main course or side dishes, especially for children	
	Promotional activities to encourage the ordering of food in excess of what can be consumed	
	Food decoration	
	Free food waste, free condiments, and free dishes	
	Service errors	
	Food quality is unacceptable	
	Ordering an excessive amount of food when there are few diners as a result of a wish to compensate for long waiting times, face, or a desire to sample more foods (cultural, physical, and habitual influence of consumers).	
	Consumer concern for food safety (suspicious of food quality)	

Source: Author's own (extracted from Gao et al., 2021)

Regulating and monitoring the operations of these phases is essential for the reduction of FW; both managers and staff are responsible for taking precautionary steps to minimise the rate of waste before and after operational activities. As argued by researchers, FW exerts a detrimental effect on human beings, the environment, and socio-economic well-being. There is a need to avoid the rise in FW simply because this is essential for social well-being. The distribution of food for human consumption is significant in the management and handling of food within the food system's operational stages, hence stakeholders' cooperation is essential in the management of food within the sector. The adequacy of food supply to the various outlets, households, and institutions is determined by the handling of food at these stages.

For this study, the generation of FW is examined from the procurement of raw food supplies through to food storage, preparation and cooking, consumption and ultimately the disposal of FW. This report does not provide an in-depth study of the warehousing and final treatment of waste because this exceeds the boundaries of this research study.

2.6 The theoretical lens

This research aims to provide a deeper understanding of FW from the perspectives of multiple stakeholders and practice theory in the foodservice sector. However, this approach requires an objective viewpoint which allows a company's activities in dealing with FW, and how these might be managed, to be discussed. Several theories have the potential to support this research, representing an innovative approach and recognising the role of technology in improving the SC and managing FW. Entrepreneurial marketing orientation involves gaining an understanding of a firm's attitude towards improving company efficiency and reducing waste (Barney, 1991; Day, 1994; Qureshi, Aziz, & Mian, 2017), and resource-based view theory (Marinagi et al., 2014; Akash, 2017; Mishra et al., 2017). However, the theoretical perspective followed does help to accomplish the aims and objectives of this research report. It is considered that the above theoretical lenses lead this research towards different dimensions and directions, as its emphasis is on the practices of the multiple stakeholders in the management of FW by identifying the route for FW and how to reduce it in the Garki districts of Abuja, Nigeria. The theory of stakeholders and practice is the theoretical lens that was found to be most appropriate to achieve the specified study outcome.

2.7 Summary

In conclusion, several studies on food services and waste management suggest that a significant amount of food is wasted along the SC (Gao, 2021; Silvennoinen et al., 2015; Dhir et al., 2020). The majority of this research focuses on developed countries, with few mentioning developing

countries. However, few of these studies examine food service waste management and waste identification across the entire SC; in contrast, others consider the role of managers and staff in the reduction of FW. Thus, this research makes an essential contribution by examining stakeholder theory in the analysis of FW. To achieve this, the researcher identifies routes for FW from the perspectives of the various food service actors in the Garki district area of Abuja by determining the relationship between the various foodservice outlets and the stakeholders involved in managing the services. Food service stakeholders in the form of government authorities, private sector organisations, civil society, academics, and other actors can collaborate to find ways to reduce FW. The application of this theory provides a means of better understanding the foodservice sector of Garki districts. This view supports the understanding of how the various stakeholders' relationships work within the sector regarding structure and processes in its management. The next chapter considers the relationship between foodservice and stakeholders in greater depth to present the conceptual framework of this research.

Chapter 3. Theoretical framework

In this chapter the theoretical framework of this research study is introduced. The discussion focuses on stakeholder-practice theory by firstly describing its philosophical roots and considering how it has evolved overtime. Thereafter, various meanings of stakeholders and practice theory by different academics are represented in order to provide an understanding of the stakeholder-practice approach. This chapter builds on the discussion presented in Chapter 2 which critically reviews how the various functions of food sector (FS) stakeholders play a role in the management of the sector, particularly by focusing on sources of FW and its reduction. However, as demonstrated by research, the many theoretical perspectives used to analyse FW have not sufficiently captured the concerns of FS players and their activities. Thus, this chapter presents the structure which unites smaller elements into a single system which functions as one. Furthermore, the stakeholder-practice approach is used to explore the apparently mundane practices of Garki district, Abuja which remain generally understudied but provide valuable insights into many aspects of stakeholder-practice theory, specifically material, competence, and meaning.

The following sections broadly describe stakeholders' concepts and how they apply to foodservices; secondly there is discussion of practice theory by considering its concepts and application in the foodservice context. The discussion is then narrowed down by detailing the ways in which stakeholder and practice theory are specifically used in foodservices research, and how they apply to this research study. The third section of the chapter discusses the integration of both theories: stakeholders' and practice theory, in order to particularly understand stakeholders' attitudes towards FW in foodservice. The conceptual framework is developed based on the understanding of the above constructs in this research. This framework contributes to the extant research by applying the stakeholder-practice approach to food

services operations and management to identify the sources of FW generation and mitigating strategy for the reduction of FW generation.

3.2 The roots of stakeholder theory

In the 1960s the Stanford Research Institute (SRI) was the first to propose and describe the stakeholder approach, along with the term 'stakeholder' (Wentges & Gossy, 2008). The SRI defines "stakeholder" as "those groups whose support the organisation would cease to exist without" (p. 89 in Freeman & Reed, 1983). Shareholders, employees, consumers, suppliers, lenders, and the general public are all represented. This concept has rendered stakeholder analysis an important tool in the SRI corporate planning process (Freeman & Reed, 1983, p. 89). Stakeholder theory was originally introduced into corporate management by Freeman (1984). Groups of academics working in normative fields of business created the stakeholders' principles such as management of corporate ethics and social concerns (Freeman et al., 2010), drawing on a number of theories, including strategic management (Ansoff, 1965; Salancik & Pfeffer, 1978).

Strategic planning literature has made a significant contribution to the structure of stakeholders' current ideas. For example, Dill (1975) defines stakeholder connections from the perspectives of both influence and duties, focusing on multiple stakeholder-firm interactions. Researchers such as Rhenman (1968) use the word 'stakeholders' explicitly in organisational theory literature to describe the people or groups who rely on a business to achieve their own objectives, and on whom the company is reliant (Freeman, 1983, p.45). The literature has also aided the growth of the stakeholder notion in systems theory. Ackoff (1974) devised a stakeholder analysis approach in which individuals and organisations are viewed as elements of larger systems in which stakeholders' interactions, participation, and support are critical in

terms of system design and solving social problems by reducing stakeholders' conflicts between levels, namely subsystem (individuals), system (organisations), and suprasystem (societies).

The necessity to incorporate non-traditional business issues into the strategic management process had become critical by the late 1970s. Governments, special interest groups, trade organisations, foreign rivals, and complex matters such as labour rights, environmental degradation, consumer rights, tariffs, and government regulation are examples of non-traditional business challenges (Freeman & Reed, 1983, p.90). It is clear that stakeholder theory offers a new method of considering multi-actor interactions between stakeholders which have different stakes in an issue (Freeman & Reed, 1983).

3.2.1 The stakeholder concept

The stakeholder concept, also known as 'stakeholder management' or 'the stakeholder approach to strategic management', emphasises the fact that managers must create and implement processes which satisfy all groups of stakeholders who have a vested interest in the success of an organisation. The primary objective iis to manage and integrate the relationships and interests of shareholders, workers, consumers, suppliers, communities, and other groups in such a way as to secure mutual long-term benefits and the necessity of strong collaborations and partnerships (Wallace & Michopoulou, 2019). Many researchers use stakeholder theory to build an interpretation of companies and their activities to resolve market issues (Freeman, 1984; Freeman et al., 2018), and this view has been seen in numerous scientific fields (Raun, 2018; Morone & Imbert, 2020), representing the idea that a company can build a strategic edge by including its partners in its management function. Freeman and Reed (1991) conclude that stakeholders influence a firm's service results, either negatively or constructively. Stakeholders have the right to control their interests and should be considered by company management; as such, a company requires a collaboration of partnerships which can exert a long-term effect on

a business's priorities (Freeman, 1999, p.234). An empirical study by Roberts (1992) provides an example of the use of different approaches.

The stakeholder approach is also compatible with the management method of building a new future for a company (Freeman & McVea, 2005) by cooperation with business interest groups. Stakeholder strategy work is characterised by many distinct viewpoints (Freeman & McVea, 2005). In reality, stakeholder strategy is often applied to include a single strategic structure which is flexible to allow managers to implement new strategic paradigms within their context as changes arise (Freeman & McVea, 2005). Understanding in this way means escaping the complexities of the implementation of a new approach and changing its climate.

Secondly, the stakeholder concept is a strategic process rather than a strategic planning process. The former focuses on seeking to foresee the future, while in contrast the latter focuses on identifying a new path for a firm and contemplating how an organisation can exert an influence on the world, and also how the environment can exert an impact on it.

Thirdly, with reference to the stakeholder solution is to a firm's sustainability; Freeman describes this as fulfilling a corporation's goals. For companies to succeed in a competitive environment, firms' management must determine their plans; to accomplish these goals, a company must collaborate with others which might influence its activities at all stages. The partnership of the stakeholder is, thus, against the goal at which the company is set up and its sustainability. Stakeholder structure should not rely on a common overriding management goal for all decisions; it therefore does compete with the utility of the traditional purpose of maximising shareholder wealth. On the contrary, a stakeholder approach does not encourage a focus on a single target function as a holistic approach to management strategy. Instead, stakeholder management is a continuous means for companies to communicate and integrate with their various stakeholders, taking advantage of their partnership.

Fourthly, the strategy is to allow management to build techniques from outside a firm, recognising and investing in all facets of a partnership; this can lead to long-term results. This view argues that there is an integral aspect of value-based management within a firm's strategic context. Individual partners with disagreements are likely to work together in the long term, even though they have differing beliefs; integrating their differences of opinion is crucial to the strategic management process.

Fifthly, the stakeholder method is known to be prescriptive and descriptive (Roberts 1992; Mainarde et al., 2011), rather than merely analytical and descriptive. It blends fiscal, political, and moral analysis with strategic governance. This strategic management perspective enhances analysis discipline and realistic consequences for managers. A management strategy is intended to provide business stakeholders with a new path for companies to meet their goals and build sound data and research. Thus, it is important for firms to move beyond this definition and decide on their potential direction within their stakeholders' climate. An essential feature of the stakeholder approach is that it can be generated by their power, and not merely by their friendship. Stakeholder managers indicate that this is a mechanism in which management imagines how its decisions are likely to impact stakeholders, and it helps to create a positive climate.

Sixthly, the stakeholder strategy's interpretation concerns specific 'names and faces' rather than simply studying stakeholders' positions within the company. The critical issue here is to understand the actual, tangible stakeholders specifically relevant to the companies and their current situation. This level of understanding allows management to build solutions and plans specifically designed to benefit the company's stakeholders. Companies' sustainability relies on the support management receives from its partners; managements need to know how their clients communicate with them and what should be provided to them, so that customers follow up on a firm's achievements, subsequently looking forward to these, along with existing

achievements and their hopes for the future. A firm requires a deeper view of all types of stakeholders; this approach comes from facts, rather than general and theoretical assumptions.

Finally, stakeholder strategy calls for a cohesive and integrated approach to strategic decision-making. This is the secret to a firm's outcome, rather than the identification of strategic stakeholders. Managers need to find ways of pleasing several stakeholders at the same time, whilst operating within the company's framework. Integrating all parties' viewpoints is a successful approach to be implemented rather than one being against the other.

However, this does not mean that such integration would necessarily deliver a win-win scenario for management. Some stakeholders will not gain all the advantages, considering extensive understanding of individual stakeholder partnerships. Various stakeholder groups may benefit differently, others will be affected, and win-win outcomes cannot be guaranteed. Management must, however, always consider and balance the needs of stakeholders in the same direction. The interests of stakeholders and how they operate together influence business results, which means that the sector has various groups of stakeholders and has different roles to play in managing the sector at different levels. Stakeholder theory has been used to identify and manage the interests and obligations of various stakeholders; managers and staff, government departments, the local community, research and academic institutions, customers, and suppliers in the foodservice sector all have their roles to play as stakeholders. As a result, the routes of FW can be identified, and waste can be minimised by stakeholders' participation.

3.2.2 Application of the stakeholder approach to FW

Stakeholder theory has already been used to study FW in several qualitative research studies. Although stakeholder- and practice theory are used separately in studies, Goonan et al. (2014) evaluate the work of three different caterers, identifying a list of factors which contribute to the problem of FW. A management guideline, the 'system-practice framework', was established

on the basis of the findings of these researchers (Goonan et al., 2015). The list includes employees' perceptions of FW, electronic procurement systems, and knowledge transfer. Ofei et al. (2015), who performed case studies in hospital kitchens, present another example of the application of practice theory; the authors highlight two major ways of reducing FW which are accurately estimating client numbers and allowing for adjustable serving sizes.

Foodservice is a multi-stakeholder based sector in which the responsibility for effective food procurement and management is shared by suppliers, government departments, business intermediaries, NGOs, the public, and customers (Azzopardi, 2011). Public and private sector partners and urban authorities play a vital role in the creation and delivery of sustainable programmes (Timur & Getz, 2008); this study demonstrates that a consensus has been reached on the need for collective action in order to eliminate food waste. It is not possible to accomplish these improvements without incorporating these stakeholder partnerships which strengthen distribution (Papargyropoulou et al., 2014).

Byrd (2007) contends that the first step towards stakeholder engagement in the FSS sector is to recognise who the stakeholders are; co-creating value amongst multiple stakeholders is more than just a focus on shareholder value (Manning, 2015). Failure to recognise a single primary stakeholder group's interest brings the possibility of failure of the entire stakeholder engagement process (Clarkson, 1995). While there is no need for fair representation among all stakeholders in the decision-making process, both parties' interests should be recognised and appreciated (Donaldson & Preston, 1995). Identification and participation of stakeholders are essential steps in the achievement of community collaborations and cooperation within the foodservice sector (Hardy & Beeton 2001); the collaboration of foodservice stakeholders has benefited from the challenge of FW (Ghinoi et al., 2020).

Based on foodservice and FW management concepts, authors identify various stakeholder categories (Saftic, Tezak, & Luk, 2011; Caniato et al. 2014; Morone & Imbert, 2020). The literature indicates that stakeholders take various forms, which Waligo, Clarke and Hawkins (2013) group into six categories: visitors, business, local populations, government, special interest groups, and educational institutions (p. 343). These stakeholder groups exert an impact on the various FS firms in multiple ways, including policy, analysis, FW control, the detection of waste routes, the elimination of FW, and how it affects the environment. Researchers also categorise members (Saftic, Tezak, & Luk, 2011); these categories can be classified as: (1) primary (core) stakeholders: those with formal or official contractual relationships with a company, such as manager, owner, supervisor, chef, supplier, other employee, shareholder and (2) secondary (supportive) stakeholders: those without such contracts, such as governmental authorities, local community, and research organisations.

Table 3.1: Stakeholder types

Stakeholder type	Stakeholder
Primary or core	Manager
	Owner
	Supervisor
	Chef
	Supplier
	Other employee
	Shareholder, among others
	Transportation company
	Customer
Secondary/supportive	Government agency
	Local community
	Local resident
	Academic/research organisation

Source: Author's own

A stakeholder is any group or individual affected by FW production at foodservice outlets (Freeman, 1984, p 46). Stakeholders are also referred to as individuals or organisations engaging in management practices who can therefore control or be influenced by decisions and

actions relevant to those activities (Waligo et al., 2013). The following description by Morone and Imbert (2020), refers to a community of influencers of organisational objectives and, in this sense, stakeholders are defined in this thesis: *"Stakeholders are described as any community or persons that may or may be influenced by the achievement of the organisation's goals" (Morone & Imbert, 2020).* Morone and Imbert (2020) classify stakeholders into four key groups:

(i) players, i.e., stakeholders of high power and interest

(ii) subjects, i.e., stakeholders with high interest yet comparatively low power

(iii) context-setters, i.e. stakeholders of low power but low level of direct interest

(iv) audiences, i.e., stakeholders of low interest and power (Bryson, Patton & Bowman, 2011).

The practice of stakeholder participation is increasingly being seen in diverse research areas (Raum, 2018). A significant number of parties are interested in companies' activities, calling for a greater degree of analysis under this review. Caniato et al. (2014) propose that these can be classified into five broad groups: government, private sector, academia, civil society, and other stakeholders. This classification allows for a thorough analysis of the approaches used to classify and examine parties who might have an interest, and whose views may be considered on a given subject/case of concern (Bryson, 2004).

Thus, this research distinguishes stakeholders in the foodservice in the Garki region of Abuja (Table 3.1) based on the grouping and classification defined by Caniato et al. (2014), not conflicting with this categorisation. Boundaries should be determined by what comprises a community of stakeholders and the requirements for awarding individual membership to one

group or another (Mainarde et al., 2011), drawing on Caniato et al. (2014), arriving at: government, private sector, academia, civil society, and other stakeholders.

Table 3.2: Stakeholders groups relevant to the research for interview

Stakeholders' groups	Stakeholders engaged	Numbers
The firm:		
• Restaurant	Owner	3
• Cafeteria	Supervisor	3
• Canteen	Chef	3
• Local food vendor	Manager	7
Suppliers	Food suppliers (raw materials)	1
	Transporter (catering service)	4
Customers	Consumer	6
Government	Municipal area council member	1
Local community	Residence	3
Research organisation	Academic research	1
Total		32

Source: Author's own

From the above classifications and stakeholder recognition, realistic practice within the foodservice sector is illustrated, based on the different functions they fulfil. Stakeholder associations such as food services influence and affect organisations, thus playing a particular role in improving food procurement by defining the route to FW and recommending solutions to minimise waste. In the context of this research in the Garki district of Abuja, the stakeholders are defined in Table 3.2 above, being members and part of the groups of stakeholders identified by Caniato et al.2014)

Complex environmental issues should be handled using transdisciplinary methods and collective decisions to implement effective environmental management strategies. The use of 'top-down' and 'bottom-up' approaches encourages greater acceptance by all the stakeholders

involved (Nieto et al., 2015). This argument provides a basis for stakeholders' understanding of their different roles within the relationship and their determination to provide service for a firm's overall interest (Mainardes et al., 2011) through transdisciplinary approaches (Chan et al., 2012) to food management and an environmentalist approach to waste. Evidence emerges from the literature that the process of collaboration can be challenging for partners at any stage of its assessment.

The stakeholder approach should be participatory (Nieto et al., 2015), even within the FSS. In designing a partnership, stakeholders are expected to bring value into the relationship; each one expects benefits and wants to be taken into consideration, listened to, and to be relevant to the discussion and decision-making. However, the practice of collaboration suggests that the difference is in organisations, with individual stakeholders in a partnership posing a challenge to effective decision-making (Berger, Cunningham, & Drumwright, 2004). It is therefore suggested that the individuals involved in a collaborative relationship should, before staring their involvement, firstly decide to submit to the relationship's terms (Stadtler, 2015). Hence, role integration and different stakeholders' perspectives are likely to provide a firm with a competitive advantage over others, both within and outside the foodservice sector.

The issues of FW management can be viewed differently by stakeholders from their perspective and therefore contribute their various ideas to benefit firms. This is because waste would then be tackled from these perspectives as they are all part of the FSS and therefore relevant to food management within the study context according to Gray (1989). In the context of food service, there is evidence of barriers to the implementation of good FS practice; therefore, strategic collaboration among the various groups of stakeholders (Brookes et al., 2014) is required to ensure firms' sustainability. Apart from the involvement of different partners in mitigating these challenges, success is also dependent on awareness and understanding of ways to address them (Brookes et al., 2014).

Stakeholders can collaborate to improve firms' operational processes, especially the kitchen, by adopting different innovations. Because of the complex nature of technological innovation within a firm, different stakeholder roles are required to determine the kind of innovation to adopt. However, irrespective of the type of improvement needed, firms' continuous innovation is key to their competitive advantage. The strength, effectiveness and advantage of stakeholders' collaboration are in partners' ability to: exchange information, co-create value, improve capabilities of partners , sustainably share responsibilities and show commitment to, and ownership of, the partnership. The following section focuses on the collaboration of the various stakeholders within the food services sector.

3.3 The history of practice theory

The idea of examining society through the lens of practice theory has long existed; it can be divided into two stages. The opinions of a number of theorists, including Bourdieu, Giddens, Wittgenstein, Garfinkel, Latour, and Foucault, are based in the first phase of practice theories (Blue et al., 2016). This period arose primarily as a reaction to the challenges presented by classical social theory (Spaargaren, 2011; Warde, 2014). To address agency-structure duality, Giddens (1984) and Bourdieu (1972) developed the idea of practice theory. Bourdieu (1972, 1990) pioneered the notion of 'habitus', which expands the perspective of a recurring connection between agency and structure (Westrom, 2018); his idea of practices is related to that of habitus (Gram-Hanssen, 2010). Habits are formed throughout childhood and determine an individual's preferences, habits, and desires (Gram-Hanssen, 2010).

Conforming to structures, according to Bourdieu, is the result of abilities and habits acquired via actions, which allows people to establish societal norms and standards (Westrom, 2018). Giddens (1979, 1984) expands his account of practice theory as a theory of structuration, which is strongly influenced by Wittgenstein's work. Giddens emphasises the significance of practices

in comprehending society's structure (Ahva, 2017); he argues that the primary field of research in social sciences is not people but social behaviours, which are constantly replicated throughout space and time, based on his structuration theory (Ropke, 2009). Similarly, Foucault developed a variety of theoretical approaches which are comparable to practice studies (Reckwitz, 2002); academics such as Garfinkel (1967) focus on ethnomethodology, Butler (1990) on gender performative theory, and Latour (1991) on science studies; all can be regarded as members of the practice theory family.

Contemporary practice theorists critique the initial phase of practice theories, describing them as exclusively social and ignored material objects, technology, product attributes, and infrastructure (Ropke, 2009; Spaargaren, 2011). Furthermore, one of Bourdieu's greatest disadvantages is that his work offers no insight into social development (Brownlie & Hewer, 2011). In order not to underestimate the relevance of objects and technology, academics sought to revitalise practice theory in the 1990s, based on the work of Bourdieu and Giddens. Schatzki (1996) and Reckwitz greatly revitalised the second phase of practice theories, which focus more on the 'philosophy of action' (Warde, 2014, p. 285). Schatzki (1996) and Reckwitz (2002) establish the most comprehensive and persuasive approach to practice theory, paving the way for other academics to apply it to a variety of empirical studies. Schatzki (1996) and Reckwitz (2002) encourage other researchers to construct and advance practice theory in a variety of disciplines and situations, including healthcare, management, recreation, tourism, energy, design, marketing, consumption, and foodservices. This study employs a later tradition of practice theories to determine the pathway for FW and its reduction in the Garki district of Abuja.

3.3.1 The concept of practice

With reference to the 'practice shift' in social theory (Schatzki et al., 2001), in German sociology the concept that all social action is grounded on a body of common knowledge and practical understandings was developed by Andreas Reckwitz, placing the emphasis on practices as the fundamental unit of analysis. Reckwitz (2004) holds that such understandings are demonstrated by common people who simply know and do not actively examine, for example, how an umbrella is used during a rainstorm. Based on this knowledge, practices may be defined as "typed, routinized, and socially comprehensible" sets of behaviours (Reckwitz, 2003, p. 289). Two criteria distinguish practice theory from other social theories: firstly, by emphasising social acts, the conflict between individualistic and structural viewpoints in social theory can be addressed. Giddens argues that: "structures are both the medium and the result of the activities they successfully organise" (Giddens, 1984, p. 25).

Based on Giddens's notion, practice theories generally concentrate on "socially structured" and "socially 'structuring" practices (Brand, 2011, p. 174). By concentrating on practice, social life is no longer be limited to individual decisions based on ideas or knowledge, nor can it be characterised only by institutions such as social standards (Shove, 2010; Spurling et al., 2013). Individual preferences and cognitive resources may not always translate into matched behaviour, as explained by the "value-action gap" (Shove, 2010; Shove & Walker, 2010).

Secondly, in practice theory, materiality is essential. The usual shortcomings of traditional social theories which describe only social factors support this perspective. The interdependencies between the social world and the environment are recognised when material components of social activity are reintegrated into research (Brand, 2010), allowing for the detection of, for example, the effects of resource-consuming activities on environmental conditions. This approach, however, necessitates acknowledging the constitutive character of

things, along with the ways in which the material world affects human interaction (Shove et al., 2012).

To achieve the study's objective, the analytical framework of Shove et al. (2012) is adopted. According to this paradigm Ropke (2009) and Hargreaves (2011) classify practices with three linked components as: (1) meanings which are connected to values, norms, beliefs, ethics, and ambition, and the goals of certain actions (2) competencies, defined as abilities to carry out the activity, as well as implicit knowledge of how to operate appropriately and in line with social standards. For example, using diverse cooking techniques whilst still addressing the overall cleanliness of foodservice are two distinct fundamentals of effectively operating a foodservice. Further, (3) materiality in terms of "objects, infrastructures, tools [and] technology" (Shove et al., 2012), such as kitchen layout and equipment, as well as the socialised body of professionals which manifests itself in the enactment of skilled actions or self-expression.

Practice theory (Reckwitz, 2002) is a cultural theory which has arisen in response to the problems identified by classical social theory (Warde, 2014). The notion of practice transfers the emphasis from individual actions to consumers' social processes. The application of practice theory to the study of FW management has long been a feature of FS research (Hanssen, 2009; Hargreaves, 2011; Hennchen, 2019; Westrom, 2018; Halkier, Katz-Gerro, & Martens, 2011), and FW reduction in particular (Hennchen, 2019). Practice theory has recently gained popularity in disciplines other than food handling and business management, such as daily life (Shove et al., 2012), management (Tengblad, 2012), international relations (Bueger & Gadinger, 2014), marketing, and consuming (Bueger & Gadinger 2014l Moares et al., 2017). Academics increasingly view practice theory as a credible alternative to the prevalent economic, sociological, and consumer culture theories, which emphasise the significance of human behaviour and attitudes, believing change to be causative (Warde, 2005; Westrom, 2018).

In contrast, students of practice theory suggest that practice should be the starting point for enquiry because the meanings involved are not only in the minds of the actors, but also in the acts themselves (Watson & Shove, 2008; Shove et al., 2012). As practice theory is inter-disciplinary and not a unified theory according to standard logic, it may be referred to as a 'praxeological family of theories' in which practice is theorised to grasp the world in which we live (Reckwitz, 2002; Ahva, 2017). Despite the absence of a comprehensive theory of practice, the practice method is recognised as a separate and well-known contemplative movement (Schatzki et al., 2001). In addition, various practising theorists have given crucial theoretical frameworks for examining empirical circumstances from a practice perspective (Schatzki, 1996; Reckwitz, 2002; Shove et al., 2012). These philosophers provide a different theoretical framework for the understanding of society. All practice theorists concur that social procedures should take precedence over individual behaviour and attitudes. The three practice components covered in this study are discussed herein.

3.3.1.1 Material

The term 'material' relates to items such as objects, equipment, locations, and infrastructure which aid in the execution of a technique (Shove et al., 2012). Heidenstrom and Kvarnlof contend that: "materials are things which belong to a practice, such as objects, infrastructures, technologies, tools, products, and the body" (2018, p. 274). Alternatively put, the material component of practice includes things and materials from which they are produced, along with technology, equipment, locations, and actual physical entities. According to researchers of practice theory such as Schatzki et al. (2001) and Reckwitz (2002), material is a crucial aspect of carrying out a practice.

Materiality is often "deeply involved in the conduct and reproduction of everyday life", not simply symbolic meaning or identity expression (Shove & Pantzar, 2005, p. 44). In other

words, completing a practice typically entails using certain items in a specific manner. Materials or objects are items which need to be handled; they are the foundation of many behaviours (Reckwitz, 2002). Materials, rather than being inert items used by society to transmit symbolic meanings, are regarded as an active example of using a dominant practice in practice theory. These items or materials can be seen as part of the practice, or as an order in which practices coexist, although they support the discovery of new information about how social connections are repeated and changed (Everts et al., 2011). Materiality, in contrast, has no importance as an element of practice. Materiality only has worth when it is combined with the required kinds of competence and purpose to create a practice (Shove et al., 2012). All three elements should be present and integrated in order for a practice to be performed (Figure 3.2).

3.3.1.2 Competence

Competence is defined by Shove et al. (2012) as the abilities and knowledge needed to execute a practice. Competence is defined by Heidenstrom and Kvarnlöf (2018, p. 274) as: "culturally shared understandings of the abilities needed to execute an activity, including practical consciousness, know-how, physical skills, and background knowledge". Alternatively put, competence is the set of abilities, knowledge, situational awareness, and methods that a person needs to execute a task. Abilities and the acquisition of knowledge are achieved via education and experience over time; this forms part of a practitioner's repertoire (Ropke, 2009).

Some knowledge is acquired via formal rules, instructions, or precepts, while others are acquired through know-how (Ropke, 2009). Some competences are general and may be used for a variety of activities including reading and writing, while others, such as Nordic walking, are more specialised (Ropke, 2009). Although these abilities are partly inherent in the practitioner, the practice perspective suggests that they be seen as part of a practice which only survives via performance (Ropke, 2009). However, practice is more than simply a set of skills;

in order for a skill to become a practice, it must be evaluated in terms of substance and meanings. In summary, Shove et al. (2012) define competence as the: "multiple kinds of knowing and knowledgeability" required for an individual to excel in the activity. When the two elements of material and skill connect with the third factor, the practice becomes complete and sustainable.

3.3.1.3 Meaning

The symbolic and social significance gained as a consequence of carrying out an activity is referred to as 'meaning' (Shove et al., 2012). Meanings are the social and symbolic importance of engaging in an activity, according to Heidenstrm and Kvarnlöf (2018, p. 274); they encompass humans' mental capabilities, emotions, motives, beliefs, and engagements. Alternatively put, when people execute a practice, they also send out symbolic messages linked to their competences and the materials they are using (Shove et al., 2012). The idea of doing something which makes a person feel proud is an example of a generic meaning that can be shared by other activities. The key point is that these meanings are generated by a practice rather than by individuals, demonstrating the social element of meaning (Ropke, 2009). The notion of meaning relates to how actions create sense, encompassing beliefs, comprehension, ideas, and emotions. During practice, practitioners are simply the carriers of these beliefs, feelings, and understandings.

As a result of this explanation, it is clear that the way in which these three elements interact provides insight into how particular behaviours originate, persist, and ultimately fade away (Shove et al., 2012). This research also uses the ideas and framework of Shove et al. (2012) because these provide insight into how these three elements interact to create a distinct FW practice, and this particular concept supports the foundation of the definition of Garki FW practices.

3.3.2 The application of practice theory

Theories of practice have been used to research a wide range of topics and fields, from marketing, health, and organisation to everyday activities. The growing importance of practice theory is described in this section by underscoring how academics from several disciplines employ the theoretical foundation of practice to explore a variety of empirical contexts. To begin with, academics are increasingly using the theoretical framework of practice to investigate daily routines and monotonous activities; Hitchings (2007) employs a practice approach to learn how garden designers deal with unexpected plant traits and engage in techniques that were previously unfamiliar to them. Practice theory is also used by Christensen and Ropke (2010) to investigate the context of ICT in everyday life.

These researchers were able to move the attention away from ICT consumption and towards practices which incorporate ICT as one element among many, demonstrating the ways in which ICTs have been implemented into a variety of other daily practices and contributing to the materialisation of routine practices using practice theory. Truninger (2011) uses practice theory to better understand and analyse the culinary behaviours and skills needed to operate a new multi-food processor in the kitchen. Evans (2011) takes a similar approach, using theoretical underpinnings of practice to investigate the empirical environment of rubbish disposal. Hebrok and Heidenstrm (2019) use an applied practice method to highlight five food-related practices which contribute to household food waste, along with prevention measures to address them. Other everyday issues to which researchers have applied theories of practice include culinary traditions, dishwashing, cycling (Halkie, 2009; Spotswood et al., 2015), and snack eating (Twine, 2015).

Scholars in the disciplines of energy and sustainability also demonstrate an interest in theories of practice. Using practice theories, researchers examine the context of energy consumption in

a range of settings, such as showering (Hand et al., 2005), standby consumption behaviours to explain family energy usage (Gram-Hanssen, 2010), and washing (Mylan & Southerton, 2018). Westrom (2018) employs a practice-based method to analyse bathing practices in Japan in order to better comprehend the nation's high level of energy use. Yamaguchi (2019) investigates historical shifts in family practices and energy use by using the theoretical foundation of practice. Various academics use practice theories to examine the context of sustainability (Spaargaren, 2011; Evans et al., 2012; Denegri-Knott et al., 2018).

Practice theory has also been used in a variety of situations, including leisure (Hui, 2013), environmental behaviour (Ropke, 2009; Hargreaves, 2011), health (Keane et al., 2017; McQuoid et al., 2018), journalism (Ahva, 2017), and crisis management (Ropke, 2009; Hargreaves, 2011), and crisis management (Ahva, 2017; Heidenstrm & Kvarnlof, 2018). The benefits of practice theory have also been used in the domain of strategy to gain a better understanding of how organisations operate on a daily basis (Gherardi, 2000; Jarzabkowski et al., 2007; Johnson et al., 2007), accounting (Ahrens & Chapman, 2007), and management studies (Ahrens & Chapman, 2007) also use scholarly investment of practice methodologies (Wenger, 1998; Fox, 2000; Handley et al., 2006; Roberts, 2006).

Additionally, the marketing discipline is increasingly employing practice theory in areas such as marketing practices (Araujo, 2007). Kjellberg and Helgesson (2007), for example, conceptualise market as the product of continuing linked practices from a practice perspective. Three practices are identified as constituting markets: normalising, representational, and trade practices. Kjellberg (2008) use a practice-based methodology to study the role of marketing in encouraging (over)consumption in the different setting of X. Using practice theory, other marketing researchers investigate value research (Helkkula et al., 2012), customer value co-creation (Korkman et al., 2010; McColl-Kennedy et al., 2012), and interactive value formation (Echeverri & Sklén, 2011). Fuentes (2015) examines green marketing as a practice in a separate

study utilising a practice method; he uses this paradigm to investigate how Nordic Nature Shop locations advertise green outdoor items. In contrast, Kelleher et al. (2019) apply the theoretical lens of practice technique to comprehend music setting, investigating the co-creation of value in the collective context of symphonic music.

The scholarly work discussed in several areas herein clearly demonstrates the growing importance and the use of the practice approach. Practice theory, like the other disciplines mentioned above, has come to prominence in the sphere of food service. The following part discusses the way in which practice theory has gained traction in the field of FS research, as well as how scholars are using the theoretical perspective of practice approach to investigate various FS outlets.

3.3.3 Practice theory and the food waste context

As it well known, the reduction of FW is one of the most challenging goals facing current foodservice systems due to its environmental and economic impacts, and for ethical reasons (Dyen, Sirieix & Costa 2021) and its sustainability challenges across the scope of practice (Goonan et al., 2015). Firms' actors are already considering the best ways in which to develop programmes and actions to target and improve stakeholders' FS practices, as well as proposing methods to achieve behavioural change in order to identify waste routes and how to reduce waste within the FS sector. There is a need to approach FW in different contexts within academia. Addressing such a challenging societal and economic issue requires academics to adopt innovative thinking; the literature which focuses on social marketing, sociology, and social psychology lays a foundation for a clearer knowledge of the course of FW (Dyen et al., 2021), in terms of drivers, including at foodservices level.

Taking into account the above emerging considerations and the evidence available highlights the link researchers have established between disciplines; the adoption of an interdisciplinary

approach to achieve a more holistic outcome in solving FW issues is therefore appropriate. Many socially-oriented researchers have debated and encouraged practices which are sustainable and reliable within firms (Hargreaves, 2011; Sonnino & Williams, 2011; Spaargaren, 2011). Research shows that attitude, knowledge, planning, shopping habits, education, and leftover reuse routines exert an effect on FW (Romani et al., 2018, Visschers et al., 2016; Secondi et al., 2015). FW can be identified and reduced by using practitioners' knowledge and suggestions, helping to provide ways to reduce FW within foodservices by specifically investigating their social norms, knowledge, food storage handling, and consumption with interventions such as information sharing, education on how to improve planning skills, and information on cookware (Romani et al., 2018; Reynolds et al., 2019, Aschemann-Witzel et al., 2015).

As FW occurs as a result of various daily practices, a call for changes in practice in food services are likely to result in a reduction of food waste. It is essential to develop anti-waste practices (Dyen et al., 2021) as an important approach to activities (Plessz & Etile, 2019). The practice theory approach to management in FS firms focuses on the various activities of different players towards the development of problem solving and decision making with the aim of FW reduction. Meanwhile, the practice theory approach guides foodservice actors in the integration of various practice elements: materials (things, technology, and infrastructure), meaning (symbolic meaning, ideas, norms, value, ethics, and aspiration) and competence (knowledge, skills, and technique) (Pantza & Shove, 2010).

Figure 3.1: Components and elements of food service practices

MATERIAL
Product
Building
Vehicles
Serving space
Technology
Infrastructure

COMPETENCE
Training/workshop
Developed skills
Knowledge
Techniques

MEANING
Attitude
Accomplishment
Value
Ethics
Belief
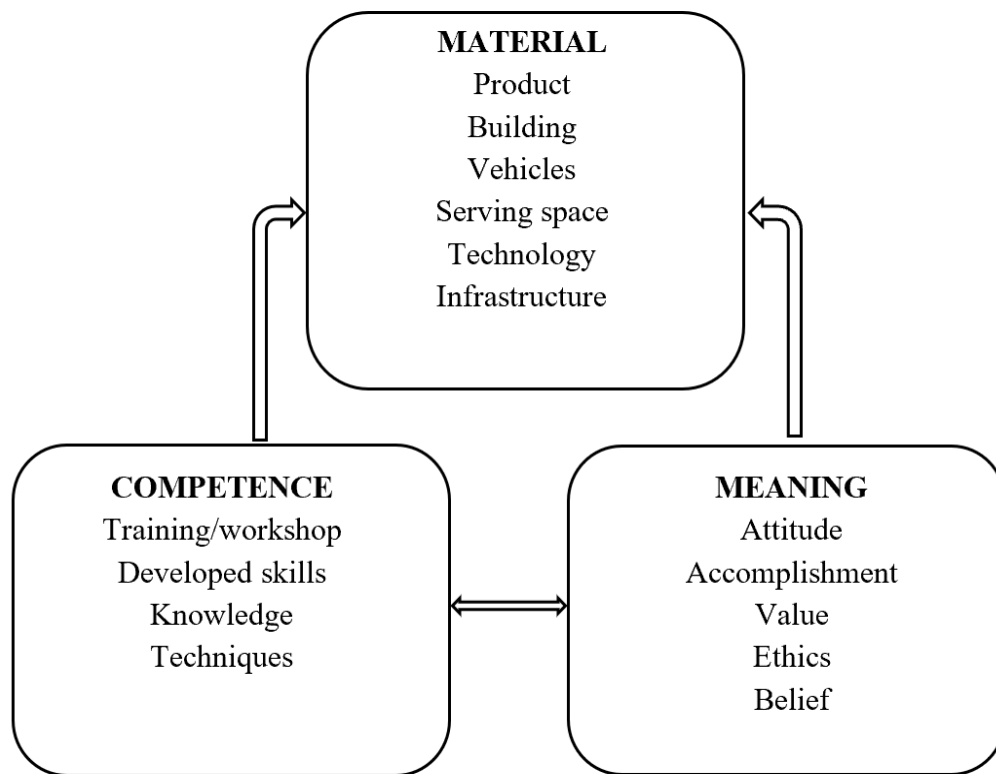
Source: Author's own

Goonan et al. (2015) hold that practitioners dynamically combine these elements through performance, resulting in one of three formulations: (i) the elements exist but have yet to be integrated (ii) the elements are actively integrated, and (iii) the elements have been integrated, but the sustaining ties have been broken. Effectively, as relationships between elements are built, challenged, or broken, practices might be produced, stabilised, or disrupted. In the case of food preparation, the practice is cooking, and the chef is the practitioner. Cooking requires a specific set of images, such as how food should taste or how a dish should look, and skills such as food preparation procedures and materials such as pots, knives, menus, and cooking facilities. The connections between the aspects of images, skills, and materials can be created and maintained throughout the meal preparation process, as well as over a long period of time. This approach to social practice theory can help people to become more conscious of their

activities within foodservices. Managers of foodservice establishments should investigate the elements of behavioural practices to devise strategies which convince employees to engage in more FS-friendly activities.

Despite the fact that many behavioural approaches emphasise an individual's responsibility for the outcome of his or her actions, social practice theory shifts the emphasis to the practice itself as the central unit of analysis (Goonan et al., 2015). Other generational academics support practice theory as a powerful tool for understanding daily practices and promoting behaviour change (Evans, 2012). A central message of social practice theory in the FS context is the importance of developing patterns of activities that improve the transformation of current practices to render them more beneficial to the reduction of FW, rather than focusing on education or persuading various individuals (stakeholders) to change their behaviour. There has been no unification of social practice theory, and no consensus on what constitutes a social practice. Research defines social practice as 'assemblages of constituent elements' (Figure 3.1).

While social practice theory has not to date been applied to FW and is not mentioned in the foodservice or food system literature, it lays the groundwork for ethnography and qualitative research in which interviews and focus groups help to detach analysis from the individual (Rabiee, 2004). This study's approach is to comprehend their social systems, cultures and social life, including daily activities, and focusing on people collectively by examining their learned behaviours, customs, and beliefs. The study employs a method widely recognised by FS scholars as an effective way to comprehend a variety of complex real-world issues, such as an investigation into FW management and the roles of different stakeholders in Abuja's Garki district. The newly proposed stakeholders-practice framework integrates social practice theory into the stakeholders' established framework to address foodservice issues (Figure 3.3).

3.3.4 Multi-stakeholder collaborations and practices

The literature review carried out on firms' stakeholder's collaborative and stakeholder theory enabled the researcher to analyse stakeholder roles and collaborations in the context of FLW mitigation in the food services sector. It was challenging to analyse stakeholders' views and how they relate from a literature review without expanding the understanding from other sources of data, hence the study employs a stakeholders' world view from a focus group perspective and interviews to examine the practices of both core and supportive stakeholders to co-create value in a multi-stakeholder' context. In this way this study identifies the specific areas of collaboration of information sharing, communication, reporting FW, and developing strategies which are geared towards FW reduction. This study maintains that FW can be reduced by integrating multi-stakeholders' practices to the operations and management of food services around the kitchen area. On the basis of stakeholder theory, the study categorises the various stakeholders in the food services sector into primary and secondary roles as manager, owner, supervisor, chef, supplier, shareholder and/or other employee are the primary FS stakeholders. There are also other stakeholders who, through the design of policies/regulations by the government and its agencies, research organisations, academic institutions, and the development of technologies, support primary stakeholders in reducing FW at the operational stages of FS: pre-kitchen, kitchen, and post-kitchen.

Through multi-stakeholder practices, firms can collaboratively engage to provide information, awareness, and training to improve their reputation and packaging; these are key elements of their practice (Shelve, 2012). Also involved in the multi-stakeholders' collaboration is the area of materials and finances, with the aim of bridging the gap between the different operational functions connecting the various primary and secondary stakeholders. In relation to FW, collaboration between downstream multi-stakeholders can help to improve product-based performance such as quality and durability (Vachon & Klassen, 2008).

To achieve the above, stakeholder relationships are beneficial and sustainable when the key stakeholders to a firm are identified; this determines the needs and expectations of the stakeholder group. All members of a collaborative relationship are monitored to ensure that each member receives their share, and that policies and regulations are designed to meet this expectation.

Figure 3.2 Building and managing stakeholder relationships framework.
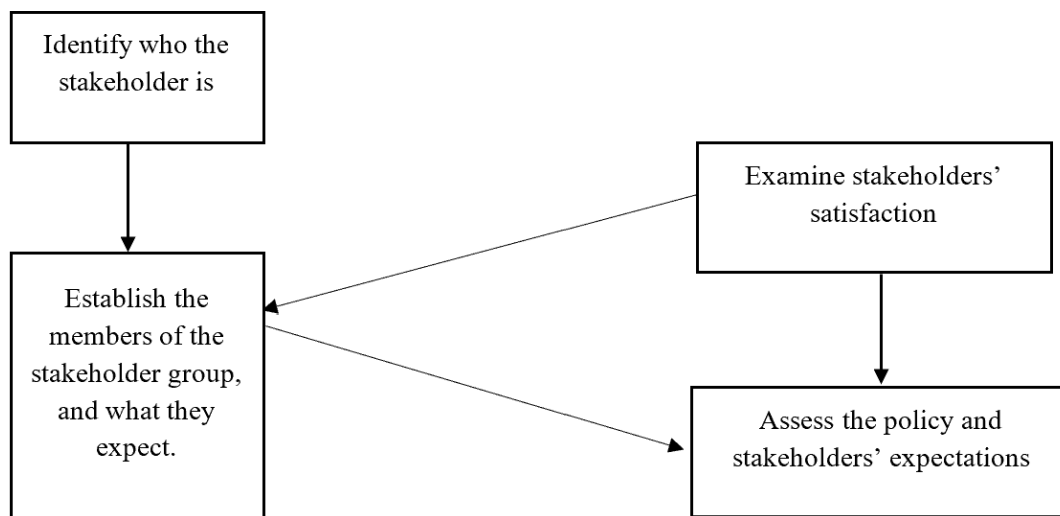
Source: Adapted from Jurgens, Berthon, Papania, and Shabbir (2010)

According to this study, supporting stakeholders include numerous NGOs, governments and governmental agencies, financial institutions, scientific organisations, universities, sector regulatory bodies/associations, and international organisations. There is well-established evidence that stakeholders play an important role in the food supply chain. However, primary or core stakeholders' activities lead to more FW, especially when food practices are not well handled, and the role of supporting stakeholders becomes to provide strategy and policies for waste reduction.

Collaboration as an essential technique for mitigating FW has gained more validity and urgency among food service practitioners across the supply chain (Govindan, 2018; Mena, Terry, & Ellram, 2014; Priefer, Jorissen, & Brautigam, 2016). This approach is based on the understanding that waste occurs at all levels of the food supply chain as a result of routine activities (Göbel et al., 2015), thus tackling waste is challenging and requires multi-stakeholder engagement. Multistakeholder-practice initiative helps in the analysis of stakeholders' handling in order to identify the many types of practices in which stakeholders participate across the food supply chain.

Multi-stakeholders' collaboration is intended to provide a response to the issues of FW, as explained by Dania et al., (2018), as a collaborative factor; research by Diana and other seeks to address concerns with supermarkets/retailers and suppliers, food services have similar characteristics with that of supermarket/retailers in terms of stakeholders characteristic and FW challenges, thus these expect the result of collaboration amongst stakeholders of the food services to provide similar result such as waste reduction as a result of stakeholder engagement.

Table 3.3: Ten collaborative factors

Norms	Key Focus
Joint efforts	Collaborative planning, implementation, and performance evaluation for the achievement of shared objectives
Sharing activities & Collaborative value	Sharing knowledge, risks/rewards, and resources fosters a culture of mutual support, fostering mutual understanding and discouraging a blame mentality
Adaptability	Motivating partners to align their own objectives to those of their partners, matching each other's techniques and tolerating their differences
Trust	Establishing mutual trust, meaning that self-interest does not preclude mutual benefits

Commitment	Supporting partners to strengthen and sustain their ties in order to co-create value
Power	Providing leadership and establishing parameters in a collaborative partnership
Continuous Improvement	Organisational learning facilitates partners' realisation of their full potential
Coordination	Distributing the work among the partners in a manner which avoids disagreements and ambiguity
Stability	Encouraging partners to preserve trust in the relationship and prioritising long-term gains over short-term gains

Source: Adapted from Bhattacharya and Fayezi (2021)

This research emphasises the need for collaboration rather than confrontation. Hence, Dania et al.'s research on collaborative variables is applicable to it. The FS sector is a firm with multiple stakeholders who have varied responsibilities inside the same system as internal participants or external actors. Collaboration, in contrast, is defined as working together to give assistance to other stakeholders in order to improve sector performance. In food service, collaboration enables a charitable NGO to take food which is overproduced and distribute it to those who need it.

Governments may offer incentives and design regulations to help FS stakeholders overcome infrastructural issues. These incentives exist in various countries; in China the government provides a programme facilitating the storage of grains post-harvest. Storage facilities are run by the government in close proximity to industrialised countries this help in food management and has achieved sustainability in the sector, this resulted to lose of less than 0.5 percent of their contents. Economic incentives are offered by the Chinese government, which implements relevant policies to assist farmers in the improvement of storage conditions (Liu, 2014). As a result, there has been a decrease in FLW in the production, post-harvest, and storage stages compared to South Africa, Zambia, and Haiti (Gangwar et al., 2014). However, this does not include Nigeria due to a lack of collaboration between the FS sector and governmental

institutions. Other stakeholders, such as academic institutions and research institutes, suppliers, local residents, and individual firms, could collaborate more effectively.

3.4 Developing the conceptual framework.

This research uses stakeholder theory and practice theory as a conceptual framework to examine stakeholders' profiles, roles, and practices which influence both FW reduction and generation within the FS sector. This provides a holistic investigation of the causes of FW generation and how it could be mitigated in the context of Garki district food services by applying these two theoretical perspectives together. This helps to provide an understanding of the type of stakeholders involved in the sector, the essential properties of FS stakeholders, and the practice approach underpinning the successful mitigation of FW in the context of Garki districts. Therefore, the application of the two theories enables the researcher to gain a better perspective on how Garki's food sector can improve its opportunities and address the challenges it faces.

3.4.1 The multi-stakeholder practice approach to understanding FW reduction in the FS.

This study's conceptual framework is guided by stakeholder theory and practice theory. Hence, the two are integrated (stakeholder-practice) as the study concept to understand FW reduction in the foodservice sector. The framework focuses on stakeholders, including suppliers, customers, local residents, firms, and research organisations. There is then analysis of foodservice stakeholders' activities in the sector's sustainability through practice.

From the literature reviewed, the foodservice sector is affected by different stakeholders' activities (Morone & Imbert, 2020). Stakeholders use various practices to improve the process of handling food at the operational stages (pre-kitchen, kitchen, and post kitchen), where the majority of food waste occurs. Hennchen (2019) emphasises that a theory of practice is required

to study FW because, according to Connell (1987), practice is: "what people do by way of constituting the social relations they live in' (p. 62), and practice theory is very useful in: "getting a grip on the interweaving of personal life and social structure" (Connell, 1987, p. 61). Academics such as Dyen (2021) and Goonan (2013) focus on conceptually developing and applying practice theory to the study of FW in the food services sector. Therefore, if foodservice is understood from the perspective of practice, this means that FW occurs as a result of stakeholders' practices.

Effectively, supply chain efficiency and FW reduction can be achieved through behavioural changes in stakeholders' practices. The concepts of food waste and stakeholder- and practice theory raise the need for an empirical FW reduction framework. Figure 3.3 presents a structure which links these concepts in a way that enables the empirical study of FW reduction in the FSS. The different role of stakeholder practice presented above is to identify and provide recommendations for FW reduction in the context of FSS, forming the thematic model of the linkages between factors which can influence the outcome of FW management, i.e., individuals' practices in the food system.

However, stakeholders' responsibilities within a firm are geared towards providing input and support for the effective management of FW (Morone & Imbert, 2020; Mainardes, 2011). This practice helps to identify where this waste occurs, recommending solutions to stop its generation. Stakeholders' theory has been known and advanced by academics as a useful management tool in the management of firms' complex issues and the improvement of their performance (Freeman & Mcvea, 2001; Morone & Imbert, 2020; Mainardes, 2011). The effectiveness and adoption of the stakeholder-practice approach does not exclude any firm irrespective of its location and/or nature. A well-coordinated stakeholder-practice approach to FW can help redesign how firms operate within a competitive environment in order to achieve

set targets. Foodservice firms are known to have considerable numbers of participants in the management of the sector; this cuts across public and private sectors involved in the firms' running in terms of the formulation and control of policies. Therefore, a sector's performance is influenced by these stakeholders.

3.4.2 Stakeholders and their practices in Garki's FS sector

The level of involvement of different stakeholders in firms' operational management varies; this difference results from the roles they play within the firms. For example, the government plays the role of monitoring and control, while firm owners and staff are responsible for their long and short-term management and control. At the same time, transport providers, suppliers, and distributors are responsible for the effective supply of products. Other non-direct actors such as academia, activists, media, local community, and customers formulate direction through various forms of criticism. The various practices adopted by all stakeholders help to improve food supply throughout the entire chain and, therefore, lead to waste reduction.

Previous research primarily focuses on the causes of FLW generation and potential solutions (Gustavsson et al., 2011; Papargyropoulou et al., 2014; Raak et al., 2017). However, much of this research focuses on single aspects of the food supply chain, rather than the activities of a firms' various stakeholders and how they affect the sector. Canali et al. (2017), seek to identify, classify, and analyse the key causes of FW generation across the entire food supply chain, as well as the consequences of current technological advancements, supply chain management, and consumer behaviour and lifestyles. They bring technological, institutional, and social issues into play, whilst also appreciating the complexity of the interconnections between supply chain players. In reality, due to the complexities of the food system, researchers and practitioners alike face a significant barrier in tracking this issue (Bilska et al., 2016; (Giuseppe et al., 2014; Raak et al., 2017).

Studies discuss stakeholder theory and how it is used to understand phenomena from another domain (Freeman & Mcvea, 2001; Morone & Imbert, 2020). FW reduction has not been holistically addressed within the context of stakeholder-practice, which describes stakeholders' activities as influencing the outcome of firms' operations. The issue of practice is absent from the management of foodservice because the majority of the discussion centres on stakeholders' role and not practices from the perspective of competence, material and image, which has great potential in the reduction of food waste. Stakeholders cannot work in isolation within the foodservice system in performing their individual practices and achieve better FW management, hence there is a need to collaborate with others. The management of food involves many parties, as earlier explained and presented in Figure 3.3 Therefore, no single individual can achieve firms' overall objectives alone. There appears to be a consensus that decreasing FW requires a collaborative effort among various stakeholders to successfully implement changes in technology, practices, and regulations that cannot be afforded by a single actor (Papargyropoulou et al., 2014). There must be an integration of process and functions to achieve firms' stated objectives. In this case, these objectives are the identification of FW and waste reduction in the foodservice sector of the Garki districts of Abuja.

For a firm to achieve these set objectives, there must be a clear understanding of how their various roles connect and what parts of the function are required for an individual stakeholder group. This suggests that the collaboration of these multiple groups of stakeholder-practice is vital to understanding the route of FW, and to making recommendations on how to reduce them. Although the multiple stakeholder relationship is complicated (Jones & Harrison, 2018), it is beneficial to achieve improved food supply chain performance and firm sustainability. FW is classified threefold, based on how the wastage occurs; it occurs in different forms: avoidable, unavoidable, and potentially avoidable (Dhir et al., 2020).

The circumstances in which they occur imply the descriptions ascribed to them. For example, food originally good for consumption and now inedible only because it has deteriorated is referred to as 'avoidable waste' (Dhir et al., 2020). Food becomes unavoidable FW which, in normal circumstances, is not fit for consumption, such as meat bones and fruit skin. Meanwhile the term 'potentially avoidable FW' applies to a specific type of waste which is sometimes but not always consumed, such as potato skins (Papargyropoulou et al., 2014). FW which is 'avoidable' or 'unavoidable' results from the practices of the stakeholders within the sector; improving their operations is likely to help to achieve waste reduction.

Understanding the classification of how this FW occurs provides an opportunity for foodservice actors to identify the source/s of waste generation. The evidence available shows that FW occurs at the downstream of the supply chain, and particularly at consumer level. The foodservice sector accommodates consumers predominantly in restaurants, catering services, canteens, and cafeterias; it is these operational departments in which food is procured and stored as raw material, processed by staff who handle food at the kitchen stage and the post-kitchen stage, and where it is served to the various customer segments.

Figure 3.3: Conceptualisation of multi-stakeholder practice in FW identification and reduction
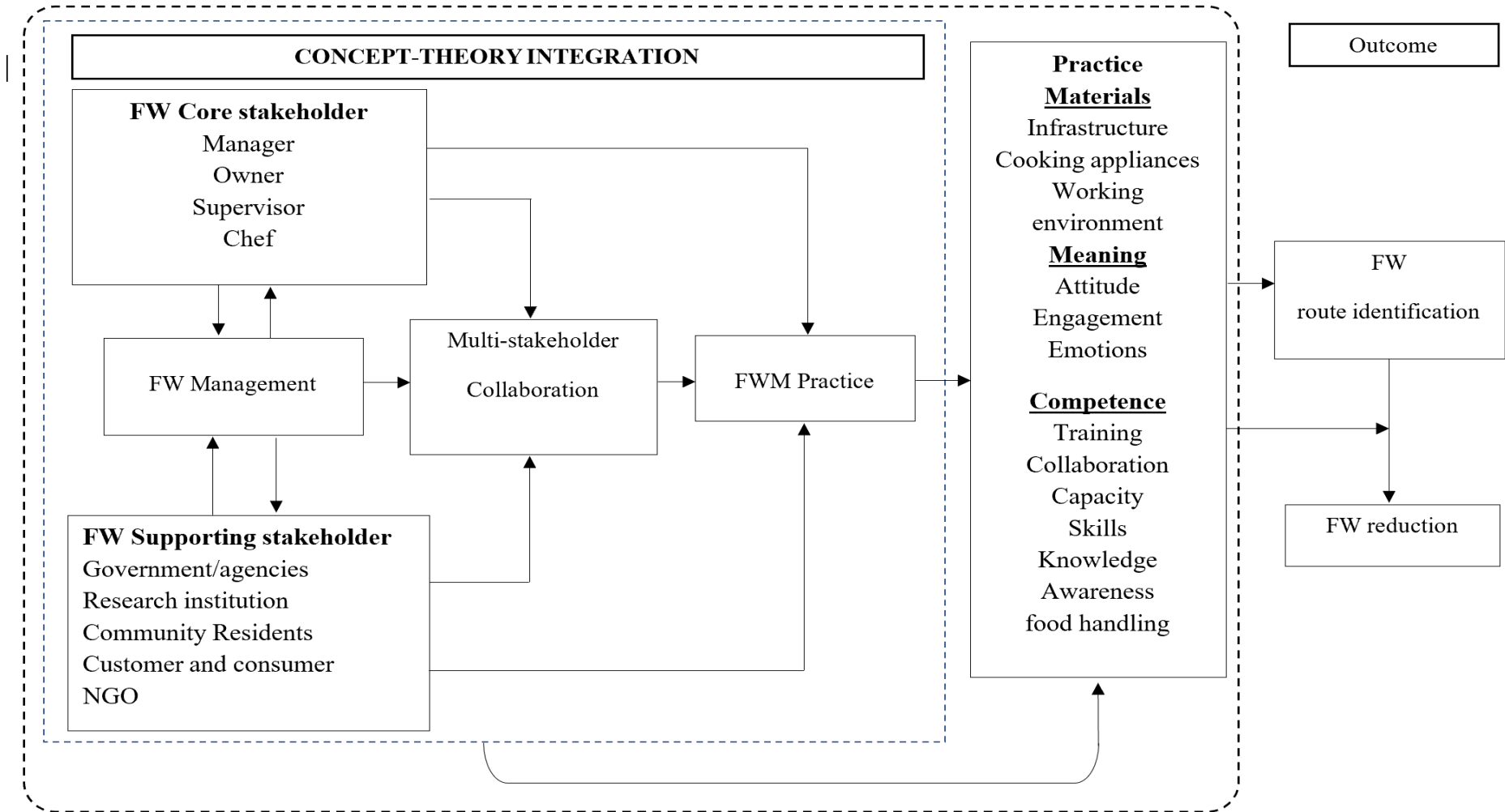
Source: Author's own

All these stages require the use of knowledge, skills, and techniques from multiple stakeholders in order to innovate (Martin-Rios & Demen-Meier, 2018), making use of the available technology and infrastructure in a more useful way. Approaches to the reduction of FW have been generic, with less attention paid to the need for change in the stakeholder-practice approach. FW prevention, when considered from the practice perspective, can produce results which are beneficial for foodservice actors. Filimonau and Coteau (2019) and Dhir et al. (2020) provide an account of other approaches that have been adopted which are common in the majority of the available literature; these include applying practice theory to the issue of FW in kitchen processes such as cooking and meal preparation, and the control of food waste (Hennchen, 2019).

These studies indicate that the various causes of FW necessitate a multi-stakeholder systemic strategy. Drivers of FW within the food SC are insufficient communication and cooperation (Burgos et al., 2017). FW is a complex issue which spans multiple policy sectors and lacks a cohesive approach to the reduction of per capita FW, resulting in sub-optimal trade-offs between policy goals. This study finds that stakeholders have a low level of knowledge about FW management, use poor forecasting, are unaware of the condition of storage facilities, lack compliance with good hygiene, and place orders inconsistently; additional problems are unserved dishes, overproduction, low employee skill levels, and poor food and material handling, including menus.

The application of theories is vital because this facilitates the accommodation of diverse views to generate in-depth knowledge about stakeholders' roles and practices in FW prevention (Dhir et al., 2020). Therefore, this study builds on the stakeholder theory of corporate management (Freeman, 1984) and the theory of practice (Shove et al., 2012), also using the perspective of foodservice actors to understand the sources of FW and reduction within the Garki districts of Abuja. The conceptual framework of this study is illustrated in Figure 3.3.

3.5 Summary

In summary, this chapter demonstrates how the combination of stakeholders and practice theory supports the identification of key stakeholders and their practices, enhancing understanding of how the integration of these theories helps to identify and reduce FW in the Garki districts of Abuja, Nigeria from the perspectives of various foodservice stakeholders such as managers and staff, government departments, and the local community, as well as the research findings. All of these groups of stakeholders exert an impact on, or are impacted by, the various practices in the foodservices industry, and the effects of their different practices may help to sustain the sector, with a focus on FW reduction within the study context. The role of stakeholders and how their actions influence behavioural and practice changes in the sector are the subject of this section.

The effect of stakeholder-practices in the FS system is examined in this research, considering the different strategic approaches taken by stakeholders in their practices and how these practice elements integrate to enhance performance in the handling of food service activities within the sector. The combination of these two ideas offers a comprehensive view of the FSS in Garki areas. This perspective seeks to comprehend the significance of stakeholder practices in the control of food waste. By combining the two theories of stakeholder and practice an integrated framework is created, providing a better understanding of the complex functions of stakeholders and the activities they undertake, as well as FW route identification and reduction within the FS sector. Chapter 4 examines the justifications for the selection of the study's methodological/philosophical approach, along with the grounds for selecting the interview, focus group discussion, and observation instruments.

Chapter 4 Research methodology

The preceding chapter presented the rationale for adopting the multi-stakeholder-practice framework to address FW issues in the foodservice sector. This chapter presents the theoretical and practical considerations about the appropriate methodological tools required to realise the aims and objectives of the research, which are stated in the first chapter of this study. In order to achieve the research purpose, this chapter firstly presents the discussion on research philosophy, including the rationale for the selection of the epistemologies of constructivism, ontology, and interpretivism (Crotty, 1998). Secondly, the study design is presented and clarified in terms of the unit of analysis, requirements for the selection of firms and participants, and a comprehensive research procedure for the initial and final data collection. Thirdly, the study presents the basis for the use of semi-structured interviews, observation and focus group discussions as a strategy (Yin, 2009) concerning: (a) meeting the necessary criteria for using interviews and focus groups as a strategy (b) addressing the aim and objectives of the research study (c) how it aligns with the research philosophy, and (d) considering different streams of data. In the fourth part the study discusses the value of research quality in terms of validity and credibility (Denscombe, 2010). In the fifth and final part, the data analysis methodology and the use of manual thematic analysis to produce the empirical research findings are described. The data analysis and study findings are essential in modifying the conceptual framework described in Chapter 3. A general summary concludes the chapter.

To reiterate, the research objectives for this study are:

1. To conceptualise multi-stakeholders' practices and their role in FW reduction

2. To contextualise the problem of FW in Garki district's food service sector

3. To critically review multi-stakeholders' practices and their roles in reducing FW in Garki district's food service

4. To generate recommendations for practitioners and decision-makers on best practice in the promotion of sustainable food service in Garki districts which would be applicable to additional domains.

4.1 Philosophical underpinning of this research: constructivist interpretive paradigm

The research philosophy describes the researcher's perspective and how the reality under investigation is understood. The nature and development of knowledge in a specific field is linked to research philosophy (Saunders, Lewis, & Thornhill, 2019), as is the preference of research strategy used (Saunders, Lewis & Thornhill, 2012). Although research philosophy is a wide area, a researcher's epistemological, ontological, and methodological thinking about it is guided by a research paradigm's basic, underlying premise (Guba & Lincoln, 1998). Each of these has significant differences, which influence how a researcher thinks about the research process; as a result, a researcher is well-equipped to explain the rationale for a chosen method, methodology, and data collection techniques (Saunders, Lewis, & Thornhill, 2012). Saunders and colleagues (2009) contend that the strategy to be adopted should not only enhance the researcher's evaluation and choice of a suitable research approach, but should also support the effective defence of one's position and choice of approach. The philosophy of research is the knowledge of the method and technique by which data about a topic is gathered, analysed, and used (Creswell, 2009). This section considers the study's metaphysical assumptions from an ontological, epistemological, and methodological standpoint. Figure 4.1: Philosophical position of the study

Figure 4.1:Overall philosophical stance of the research
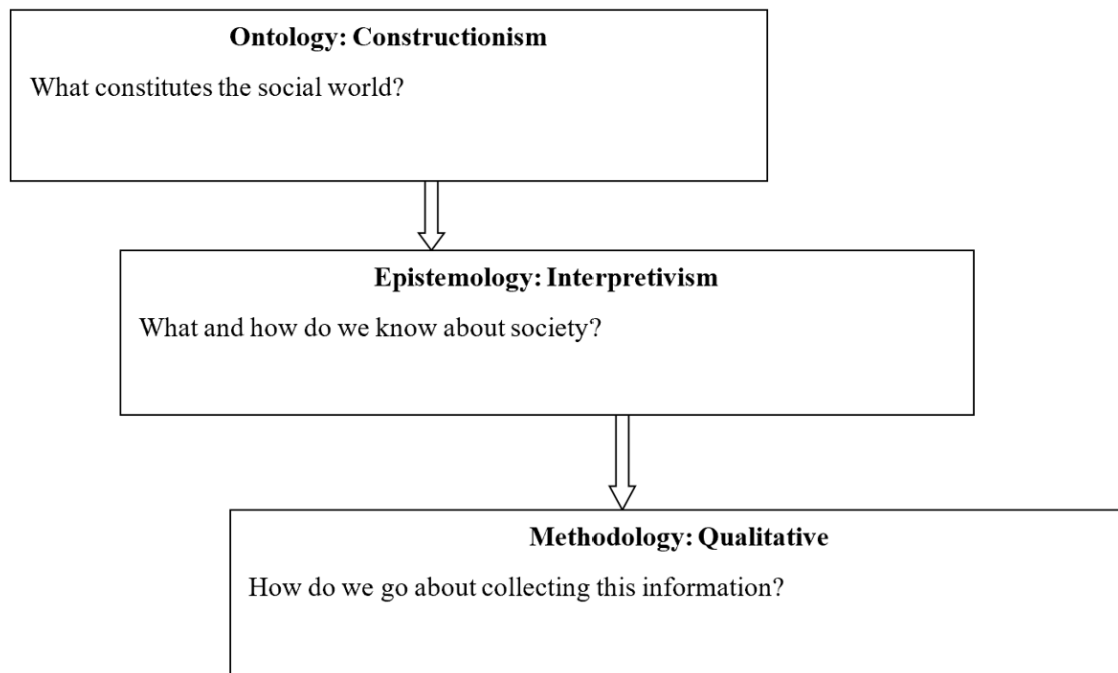
Source: Author's own

4.1.1 Ontological position of research

The subject of ontology concerns the form or essence of existence (Crotty, 1998). It emphasises researchers' dedication to specific viewpoints and ideas about how the world functions (Neuman, 2011). The central question is whether a) social phenomena and their meaning can be considered as external realities outside the influence of social actors, as in 'objectivism', or b) whether they can be considered as social constructions based on social actors' perceptions, interactions, and behaviour, as in 'constructivism' (c) if the world is an absolute unity, because pragmatism is about 'what works and solutions to the issues at hand, so study should still take place in social, historical, political, and other contexts' (d) whether, in what is known as 'post-modernism', reality is inherently inaccessible to human enquiry, so that knowledge claims are the result of current world circumstances and truth claims are political power plays (Bryman & Bell, 2007; Creswell & Tashakkori, 2007).

The researcher believes that key participants in the food services sectors, such as firms' owners, managers, and staff, government agencies, customers, local residents, suppliers, research organisations, academics, and other stakeholders face numerous realities in the course of their engagement and collaboration in the control of FW in the FSS. This aligns with constructivism's ontological assumption. Furthermore, each of the players in the Garki Abuja FS sector investigated had distinct experiences regarding the generation of FW and mitigation strategies; these experiences are dynamically important across the many strategic phases of the issue. As a result, the findings of the participant' in this research are unique, and the FSS can provide more accurate recommendations for the treatment of FW. In order to accomplish the 'aim and objectives of this research study, the researcher asserts that investigating, identifying, and describing the different realities from the viewpoints of important players in the FSS in the Garki area of Abuja provides insight into this issue.

This is because these individuals' experiences during the interview stage do not happen externally or independently of them; as a result, it was essential to analyse and explain the various perspectives of these specialists in the context of the phenomena under investigation. This led the researcher to spend extra time with these individuals throughout the study in order to gain a deeper understanding of their social circumstances. Rather than finding or testing 'the most suitable answer,' this study set out to investigate the specific experiences of key participants in the FSS, especially as this relates to FW management in the Garki districts region of Abuja, Nigeria. Based on this, the study's ontological assumption is closely connected to a constructivist model, which supported the researcher's approach in understanding the subjective reality of Garki areas' FW management processes in a way which was applicable to the research participants. The research's epistemological stance is discussed in the following section.

4.1.2 Epistemological position

In all fields, epistemology is concerned with the issue of what constitutes rational understanding (Crotty & Crotty, 1998; Denzin & Lincoln, 1998). Bryman and Bell (2015) state that: "a crucial issue in this context is whether the social world can and should be investigated using the same ideas, methods, and culture as the scientific sciences"". Denzin and Lincoln (2003) contend that the researcher and the study object are interactively connected, with results only being identified as an investigation proceeds. The study aims to understand how FW is produced and to identify ways of reducing it in the study context, along with the meanings and lessons learned from these experiences. Also, the study's epistemological position is to adequately learn about stakeholder-practice approaches to FW reduction in Nigeria by thoroughly researching, analysing, and explaining the results. The interpretivist notion that the researcher engages with participants to enhance knowledge is similar to this study's epistemological position. The term 'interpretivism' describes the perspectives of researchers who are sceptical about the application of scientific approaches to the study of the social world and have been impacted by various philosophical traditions.

They share the belief that the subject matter of the social sciences, such as people and institutions, is essentially dissimilar to that of the natural sciences. Consequently, researching the social world requires a specific research logic which considers people's uniqueness, in contrast to the natural order (Bell & Bryman, 2007). One central area of this study is to better comprehend social reality through the eyes of the actors who have lived through the realities being studied. To obtain the required information for which the study was planned, there needed to be close contact between the investigator undertaking the research and the research participants. Specifically, the participants' basic assumptions need to be revealed. Qualitative research was used to analyse social reality from the participants' perspectives.

The emphasis in this study is on the sense of what the main participants say, rather than determining the number of participants who have experienced similar circumstances, in order to achieve the study's aim. This study aims to learn more about FW generation, strategies to reduce it within the FSS where this waste is dominant, and the realities which underpin it. It is noteworthy that some of these fundamental assumptions might be difficult to disclose to outsiders, for example if they are considered classified information for public disclosure, or if they constitute information only available to those stakeholders in senior management positions. Accessing such data necessitates ethical considerations, such as assuring the relevant participants of their confidentiality and privacy, in order to gain their trust. A strong connection between the researcher and the participants is essential to ensure that data analysis is as close to the participants' actual practice as possible when they meet the social reality under study. The methodological section of the research is discussed in the following part of this study.

4.1.3 Research methodology

The methodological section concerns the researcher's ability to collect knowledge of what is believed to be known. Researchers must rely on their philosophical and historical assumptions to develop analytical approaches suitable for the issues being studied (Guba & Lincoln, 2005). The decision between positivist and interpretivist research philosophy is vital in ontological and epistemological disputes (Saunders, Lewis & Thornhill, 2012). The technique to employ in a study is determined by the chosen research philosophy (Denzin & Lincoln, 1998). Interaction between the researcher and the participants is the only method by which to extract and refine important information due to the personal nature of the social context. Foodservice outlets, government departments, private offices of stakeholders, academic institutions, community-owned spaces, and customers' favourite locations were used to collect data for the study. For this reason, the researcher was able to observe the participants' social environments at first-hand and communicate with them by use of interviewing methods (Creswell &

Tashakkori, 2007). Dalla and Keating (2008) contend that participants have their own realities and perceptions. Qualitative research allows them to discuss particular perspectives and meanings in order to better understand, characterise, and justify social processes.

The phenomenon under investigation is FW generation and management within the FS of the Garki area of Nigeria. The researcher holds that the constructivist interpretative model promotes the analysis within the study context of FW because it considers where the participants' interactions are formed within settings and their contexts. The preceding discussion supports interpretivist research as a feasible model for the achievement of the study's objectives. As a result, in line with the study's philosophical assumptions, the following describes the qualitative analytical method used to accomplish the research goal. The following section to be reviewed concerns study design, and how different constructs fit together.

4.2 Research design

Yin (2009) contends that research design is the logical sequence which relates empirical evidence to conclusions produced in response to the research purpose and goals. Additionally, when determining the research design of a qualitative interview study, there are five components for consideration: (a) the nature of the research goal should be posed as 'how' and 'why' questions (b) each proposition of the research goal should direct attention to a phenomenon that should be investigated within the scope of the study (c) the choice of the appropriate unit/s of analysis stems from identification and (d) the rationale for the use of analytical techniques such as pattern matching, time-series analysis, or explanation building to connect the data should be a direct reflection of the research goal (e) the requirements for interpreting the data obtained by defining and responding to competing explanations for the findings.

The researcher developed a conceptual structure for the research subject after considering these five components of the research design. The development of a conceptual framework before starting data collection, as a clear distinction between interview research and ethnography or grounded theory. It is a method of analysis that is used to contribute to meaningful discussions. As a result, the creation of a conceptual framework was considered an essential phase in this study's interview research design; this is because understanding the theory of what is being examined contributes to the selection of suitable subjects for the empirical research. This also leads to analytical generalisation in the case of interview and focus group discussion, where a previously formulated hypothesis can be supported by the comparison of empirical findings from two or more streams which support that theory (Yin, 2009; Gomm & Hammersley, 2002).

Following on from the debate about the conceptual and theoretical dimensions of conducting qualitative research, specifically semi-structured interviews, participant observation and focus group discussions were the research instruments used in this study. Qualitative research is discussed next, as this forms the background to the discussion of the data collection process.

4.3 Qualitative research

Qualitative research is used in various disciplines, by means of a variety of instruments, methodologies, and procedures. Qualitative research is related to an interpretivist epistemological approach, as described in the previous section; it focuses on understanding social reality by analysing the interpretations of the topic examined (Bryman & Bell, 2007). It is also known as 'naturalistic research' because it requires researchers to conduct research in a natural environment to build confidence and promote the active involvement of the research participants (Saunders, Lewis, & Thornhill, 2019).

When using a naturalistic research methodology to provide a rich theoretical perspective, an inductive method is employed; in contrast, a deductive technique is employed when the

purpose of the study is to examine an already-established theoretical perspective (Creswell & Tashakkori, 2007). Furthermore, in the inductive approach, a theory is developed from data analysis with little interest in the generalisation of the findings by building from particular to general, sometimes referred to as a 'bottom-up' approach, with the researcher interpreting the meaning/s of the data collected (Creswell 2009, p.4). However, a quantitative research method deduces theory from data analysis (Saunders et al., 2007).

An inductive approach was adopted in this study, given the fact that this study focuses on building theory, rather than testing it. This qualitative method approach provides a more straightforward interpretation of the participants' viewpoints, as the data collection progresses through their interactions regarding their world. The inductive approach, according to Saunders et al. (2007), allows a researcher to obtain a more refined knowledge of the interpretations which people assign to events, as well as the research context, and a more flexible structure which allows for changes in the research focus or direction as the study progresses. This study used a qualitative, interpretivist, and inductive methodology. An initial exploratory pilot study using semi-structured interviews aided the researcher in better understanding, clarifying, and gaining new insights into the subject. In Nigeria, a phenomenon has emerged in which FS practitioners i.e. stakeholders, caution other colleagues to avoid potential FW practices; this practice was observed in the course of fieldwork for this study.

Therefore, this method allows the researcher to work inductively by concentrating on a single question, refining the data and interpretations provided by the participants by snagging, via extensive questioning and observation, to ascertain a participant's point of view. Denzin et al, (1988) argue that qualitative researchers should get closer to the participant's viewpoint . As exploratory research is versatile to change, it helps people as a result of its findings and new

information, guiding the key data collection process of a research study; this is discussed in the next section.

Semi-structured interviews, participant observation, and focus groups were the primary data collection techniques used in this study; these were considered the most appropriate methods. Collis and Hussey (2003) assert that the inductive interpretive technique focuses on the consistency, extent, and richness of data gathered. As a result, a researcher can generate valuable data to better understand, in the case of this study, participants' foodservice stakeholders' perspectives or situations, identifying important areas for further research. The researcher can then delve further into problems which might emerge during the interviews (Bryman & Bell, 2007).

The goal of the exploratory primary data collection was to obtain up-to-date knowledge on relevant waste issues in the FSS and information on FW sources, and the role of food sector players. The interview and discussion questions were framed around the themes which emerged from the secondary data collection, specifically from scholarly literature, newspaper reports and observations. The consistency, depth, and richness of data available are all essential considerations in a qualitative, interpretive inductive method (Collis & Hussey, 2003). An interview schedule was created to facilitate data collection.

A semi-structured interview was used to collect data from the different stakeholders (Appendix C). The various stakeholder groups include customers, local residents, suppliers, firms' owners, managers, and staff, research organisations, and government agencies in the foodservice sector within Garki I and 2 of the districts of Abuja, Nigeria. The researcher was also able to gain more intimate insights into the participants' experiences and perspectives on reality created through the interviews. For the study, a total of 32 interviews were conducted; the type of questions posed was associated with the interpretivist model because they necessitated a

thorough examination and clarification of the meaning of the phenomenon. The following section presents a detailed profile of the respondents in this research study.

4.4 Profile of the sample

All 32 firms and participants represent the Garki foodservice sector (Garki I and Garki II), being employees of firms in the area some are people who have an interest in the sector, such as the academic researcher, community residents, and others who eat away from home such as customers and are based in Abuja, Nigeria. The interview transcript analysis helped to build a comprehensive and extended data profile of all the interviewees and their roles as a firm or interested individual.

Figure 4.2 Detailed profiling information on the interview participants and sample

Participant reference	Nature of business	Role/position within the firm	Ownership	Sex	Age	Founded	Number of employees	Location
1	Hotel restaurant	Supervisor	Private owned	F	42	2017	11 - 50	Garki, 2
2	restaurant- mull	Manager	Private owned	F	44	2003	1 - 10	Garki, 1
3	College canteen	Senior chef	Public owned	M	50	2001	11 - 50	Garki, 2
4	Transport (catering service)	Supplier to schools	Private owned	F	54	2000	11 -50	Garki, 2
5	Local food vendor	Customer	Private owned	F	41	2003	1 -10	Garki, 1
6	Restaurant	Manager	Joint venture	F	53	2000	11 - 50	Garki, 2
7	Hospital canteen service	Supervisor	Public owned	M	34	2009	11 - 50	Garki, 1
8	Catering service	Customer	Private owned	F	34	2007	11 - 50	Garki, 2
9	Research organisation	Academic research	Public owned	M	46	2015	11 - 50	Garki, 1
10	Local community	Residence (District 1)	Private resident	F	42	2004	11 - 50	Garki, 2
11	Hotel restaurant	Kitchen manager	Private owned	M	68	2014	11 - 50	Garki, 2
12	Transport (Catering service)	Supplier to schools	Joint Venture	F	40	1998	1 -10	Garki, 1
13	Local food vendor	Customer	Private owned	M	47	2016	11 - 50	Garki, 1
14	Cafeteria	Chef	Private owned	M	51	2008	1 - 10	Garki, 1
15	Government	Municipal area council	Private owned	M	34	2012	11 - 50	Garki, 2
16	Hospital canteen service	Manager	Public owned	F	45	2014	11 - 50	Garki, 2
17	Local community	Residence (District 2)	Private resident	F	41	2010	11 - 50	Garki, 1
18	Transport (catering service)	Food supplier (raw)	Private owned	F	62	2010	11 - 50	Garki, 2
19	Canteen	Owner	Joint venture	F	49	2014	1 - 10	Garki, 1
20	Restaurant	Chef	Private owned	M	47	2018	11 - 50	Garki, 2
21	Hospital canteen service	Manager	Private owned	M	44	2010	11 - 50	Garki, 2
22	Catering service	Customer	Private owned (family owned)	F	45	1998	11 - 50	Garki, 1

23	Catering service	Supplier to schools	Private owned	F	28	2011	11 - 50	Garki, 1
24	Local food vendor	Owner	Private owned (family owned)	M	41	2013	11 - 50	Garki, 2
25	Restaurant	Owner	Private owned	M	72	2019	11 - 50	Garki, 2
26	Canteen	Staff/supervisor	Private owned	M	48	2012	11 - 50	Garki, 1
27	Hospital canteen	Manager	Public owned	M	34	2020	1 - 10	Garki 2
28	Local community	Residence (District 2)	Private resident	M	61	2006	11 - 50	Garki, 1
29	Transport (catering service)	Supplier to schools	Private owned	M	42	2010	11 - 50	Garki, 2
30	Local food vendor	Customer	Private owned	F	39	2014	11 - 50	Garki, 1
31	Restaurant (hotel)	Manager	Private owned	F	40	2017	51 - 100	Garki, 2
32	Canteen	Customer (bank staff)	Private owned (family owned)	M	49	2005	11 - 50	Garki, 2

Source: Author's own

All 32 firms are classified as small and medium-sized enterprises (SMEs) based on having less than 250 employees/headcounts (European Commission 2005, p. 14) or less than 200, according to the Bolton Committee's statistical definition (Abbrey et al., 2015, p. 40; Deakins & Freele, 2009, p.30). In this study's sample, micro-entities predominate, because five businesses employ ten or fewer workers (see aggregated profiling information on participating firms in Figure 4.3).

Figure 4.3 Aggregate data on the interviewee's firms

Characteristics	Dimensions	Number of firms
Ownership	Private owned	24
	Joint Venture	3
	Public owned	5
Number of employees	1-10	6
	11 -50	25
	51-100	1
Medium of interview	Online	15
	Face-to -face	17
Nature of business	Local food vendor	4
	Catering service	6
	Restaurant	7
	Canteen	9
	Cafeteria	1
	Local community	3
	Academic/research	1
	Municipal area council	1

Source: Author's own

4.4.1 Access to food service respondents and the two phases of data collection

Between February and June of 2021, the researchers carried out 32 interviews and two focus group discussions as part of this study's exploratory phase; this excludes the previous four pilot interview studies. The interviews lasted from one hour to ninety minutes, with an average length of sixty minutes. Participants included representatives from customers, local residents, suppliers, firms' owners, managers, and staff, research organisations, and government agencies. The aim was to learn about what positions, connections, and experiences occur in the FSS. The participants were able to share their knowledge of the effects of FW and how to minimise waste in the industry, whilst also gaining a deeper understanding of the need for food consumption.

The primary goal of the study's exploratory phase was to disprove any myths which had arisen in the course of the literature review. This allowed the researcher to investigate some preliminary ideas and thoughts, to confirm the research problem, and to fine-tune the research aim and objectives; this is an important aspect of research. It provided an opportunity to learn about the various roles played by the stakeholders in the reduction of FW, how their relationships function within the sector, and also to understand how stakeholders' organisations and individual relationships worked in comparison to the stakeholder theory discussed in the relevant literature. This stage culminated in the collection of primary data from a variety of stakeholders; in particular, the semi-structured interviews with participants who had direct experience with the food services were an important source of information. To ensure that the collected data was as diverse as possible, the researchers selected participants with a unique attribute related to their experience and involvement in the sector within the study context. This extra selection criterion is an example of purposive sampling; it is also known as the greatest variation sampling technique according to Saunders, Lewis, and Thornhill (2012).

4.4.2 The pilot phase of the study

The results of the pilot study have some practical implications. Firstly, the data evidence obtained from the semi-structured interviews contributes significantly to the phenomenon under investigation. Secondly, the research goal was revised in the light of the findings. Finally, the findings helped in the redesign of the conceptual framework by introducing new constructs such as practice theory and the addition of practice elements (competency, materials, and meaning) to the conceptual framework, resulting in stakeholder-practice theory. Fourthly, the interview guide was modified as a result of the findings of the pilot study. The majority of the existing questions were retained because they aligned with the purpose and were likely to generate sufficient information (Lancaster et al., 2004), while several were updated, and some new questions were created to address difficulties raised during the pilot study. The researcher was ready to progress to the main data collection stage after completing the pilot study phase and rearranging the interview schedule.

4.4.3 Study area and selection rationale

This research focuses on Garki districts 1 and 11 of Abuja, Nigeria. This area is known to accommodate private and public corporations doing businesses on a large scale (Table 4.1). The types of business activities such as manufacturing and construction, the service sector, private offices, trades, government establishments, and political manoeuvring have resulted in significant arrivals and departures. Garki is a neighbourhood in the Federal Capital Territory (FCT), with its administrative base and geographical location in its centre (Abubakar, 2014). The city was well-planned and constructed in the 1980s to replace Lagos, the country's most populous city and the centre of political and administrative activities, which was also dominated by the head offices of government agencies and their subsidiaries.

Garki accommodates the majority of multinational organisations' cooperative and administrative offices; business and government decisions are carried out in this area. Garki has a population of 53,104 (Magaji & Mercy 2020), is located at latitude 9.07N, longitude 7.48E, and is at an elevation of 840m (2760 ft) above sea level (Ubaru et al., 2015) in FCT with mild weather and a population of around 3,277,740 according to the 2020 World Population Review (Abubakar, 2014). While Nigeria is the most populous country in Africa, according to the UN World Population Prospects Report 2019, the Department of Economic and Social Affairs affirms that 206,139,589 people (Statista, 2020) inhabit the West African part of the continent. Garki is also known as a large commercial centre which houses the famous Abuja International Conference Centre, banks, and the ultra-modern market known for its fabric design work, sports pitches, and exercise spaces. Garki accommodates eateries and hotels which have attractive features for the comfort of diners.

Thus, the city's roads are networked with the country's federal highway to provide easy links to the countryside areas and states surrounding Garki, including Kaduna State to the north, Niger State to the west, Kogi State to the south, and Nasarawa State to the east. The road network is designed to help move people in and out of the area for a single business purpose, or by integrating business activities with other parts of the country. These five economic classifications play a role in the growth of the Garki district area, which is a popular part of the FCT.

These businesses have supported Abuja, leading to an increase in residents' socio-economic situations and lifestyles, although there are safety concerns in and around the city, albeit lower than other parts of the northcentral region in which Abuja is geographically located. The military and other security agencies, i.e., civil defence and regular police, provide security. Therefore, businesses are able to operate in legal compliance, enjoying a share of the economic

opportunities available. Wholesale and retail trade business accounts for 9%, ICT 11%, banking 7%, and accommodation and foodservice business accounts for 18% (Bloch et al., 2015).

The concentration of businesses around these areas enables many people to visit foodservice outlets. This lifestyle has, in turn, characterised the people who live and work in, and visit the Garki area of Abuja. Garki is one of the districts in phase one of the city's development plans, which comprises the city's centre of Maitama, and the districts Central Area, Asokoro, Wuse, and Gorki (Figure 4.1) radiating from the foot of Also Rock. Other phases include phases two to five, in which physical and structural development is still ongoing. This study context is the Garki 1 District cadastral zone A01 and the Garki 11 District cadastral zone A03 of the FCT, Abuja.

4.4.4 Contact Persons

This study noted that FCT-Abuja and the study case Garki districts 1 and 11 constitute a very sizable area, housing multiple food services and administrative head offices of corporations, both private and public, and other businesses and services such as banking and transportation. Conducting research of this kind captures the opinions of a variety of people, taking into account their different practices, backgrounds, and operations. The researcher was mindful of the constraints of time and finance, and extra support with logistics was required; the services of two contact person were obtained, who are both residents of Garki district. One is a lecturer with the University of Abuja, and the other is a staff member of the National Bureau of Statistics of Nigeria, this being close to the research location. The choice of contact persons was also based on those who had knowledge of the research location and a good understanding of major food services within the location.

The researcher contact persons were instrumental in identifying and arranging meetings, mobilisation, and follow-up with agreed-upon meeting dates, notably prior to the researcher's visit to Nigeria, and throughout the online interviews. They also assisted in the naming and mapping out of all areas covered by the research, whilst offering suggestions for some of the areas which were expected to be less appealing and practicable during the fieldwork process. During the recruitment process, they assisted in assembling groups and ensuring that each prospective participant signed the attendance register. The assistants facilitated the organisation of focus groups in both districts, although they were not involved in the study design, data collection, or analysis.

After the researchers had decided on the location, the preliminary step of the investigation began with mapping and identifying potential participating firms for this research. The researcher gained authorisation (consent) and provided information regarding the focus group discussions and interviews to participants after identifying food service and stakeholders relevant to the research. It was decided to create a list of food services and their stakeholders, subsequently narrowing this down to the ones which were relevant to the study; the pilot study provided a valuable insight to the Garki districts.

During the familiarisation and identification visit, all possible sites were mapped out, along with likely locations for the group discussion. This was based on quiet atmosphere, availability of space, and appropriateness of location for participants. Three days before the start of the data collection process, the author visited the identified locations and firms to gain more familiarity and clarification from the potential participants in the interviews and group discussions. During this process, telephone contact with potential participants was closely monitored in advance of the scheduled days. Similarly, before the interview date, the author met the recruited interpreter for one of the interview participants who could not communicate

in English but had a wealth of knowledge of the subject area as a result of the high volume of food sales and waste generated in their local food outlet. The reason for the meeting was to ascertain that they were happy to continue with their interpreter, who serves as their manager.

4.4.5 Selection of participants

Denscombe (2010, 2017) argues that effective participant selection should be justified on the basis of their relevance to the theoretical problems under investigation, along with other practical factors, including how the resultant proof is to be used, and the researcher's versatility and/or time. This section discusses the criteria for the selection of respondents during the study design process, and the practical issues which arose due to the design.

The study set out to explore, understand, and analyse the following: (a) to identify and describe the different types of waste in food services and routes for waste reduction in Abuja's Garki district (b) to investigate how the different stakeholders involved in Garki district perceive FW management in food services and its impact (c) to investigate the motivating factors of the various stakeholders in Garki district food service to become more involved in FW and its management, and (d) to present a stakeholder recommendation to practitioners and decision-makers on best practice in the promotion of sustainable food service and FW reduction. Before the start of data collection for this study, the researcher identified groups of food service stakeholders relevant to the study (Table 3.1 and 3.2) and within the study are Garki districts 1 and 2 which have achieved significant growth and have established structures.

Figure 4.4 Stakeholder groups relevant to the research
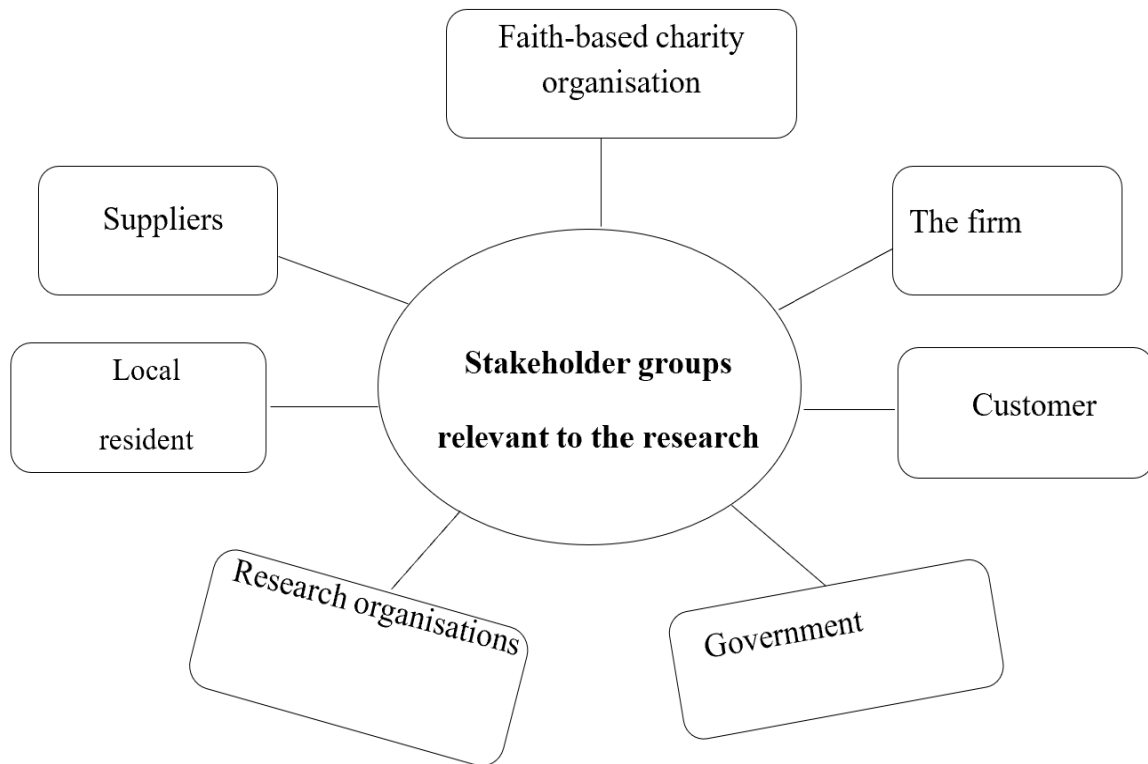
Source: Author's own

The researcher included participants both from organisations in the private sector such as restaurants, hotels, catering service firms, and private transportation companies, and publicly owned organisations such as the Abuja Development Authority, and government school canteens.

4.4.6 Unit of analysis

Another essential consideration when conducting an interview analysis is how to distinguish one feature of a social phenomenon from other similar views and from its social environment (Denscombe, 2010). Alternatively put, the analytical unit offers a study of its own particular identity, enabling it to stand out from other social phenomena. Prior to entering the study environment, a proper unit of analysis must be selected (Benbasat et al., 1987; Pentland &Feldman, 2005). Individuals, distinct organisational entities, groups in the form of

departments, and organisations as a whole are frequent units of study within the FS sector domain. When stakeholders and business practice are the primary theoretical focus of an enquiry, however, activities, processes, and routines are investigated extensively (Pentland & Feldman, 2005). The unit of analysis is often determined by the purposes and objectives of the research. In view of this observation, the primary unit of analysis in this study is foodservice stakeholders in the Garki areas of Abuja. Furthermore, determination of the unit of investigation renders it simple to propose relevant constructs to be investigated, to define the parameters for the screening and selection of potential respondents to be investigated, and, in consequence, the data to be gathered as part of the plan should be determined.

4.5 Research strategy and data collection process

Saunders (2003) holds that a research strategy is a general plan developed by a researcher which helps to answer the questions identified for the research in a systematic way. The researcher used a strategy which facilitated the collection of extensive and in-depth data on FW reduction in the FSS of Abuja's Garki district. This was designed to provide the required answers to the questions posed by the research, as presented in this study (Section 1.6 of Chapter One). This study used secondary and primary data collection methods; in general terms primary methods include in-depth interview strategy, focus group discussion, and participant observation from various stakeholder groups within the FS domiciled in the study context who understand the sector, its stakeholders' practices, their roles, relationships, experience, interest, and perceptions of FW management, and how the different practices of stakeholders influence the FS.

Figure 4.5: Data Collection process
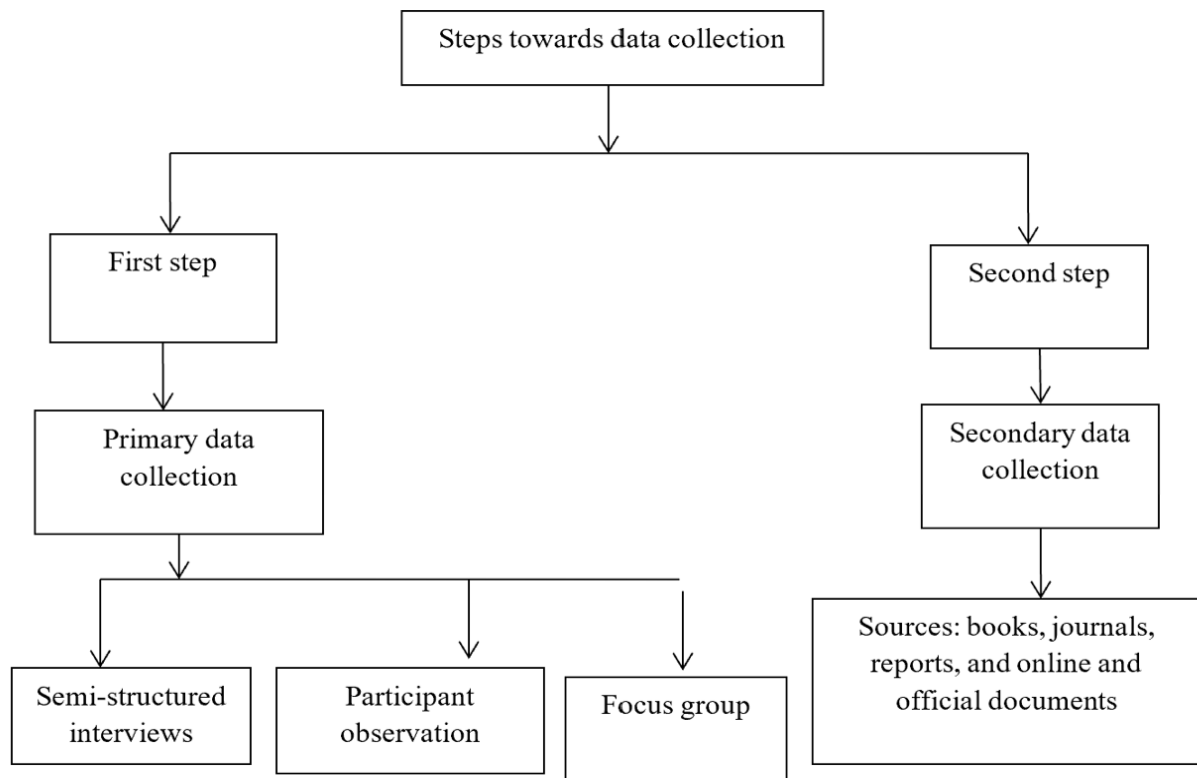
Source: Author's own

This study's data collection procedure is illustrated in Figure 4.3. The procedure comprised two steps, the first of which was to carry out primary data collection through semi-structured interviews, participant observation, and focus group discussions. This process involved the researcher carrying out semi-structured in-depth interviews with participants. In the course of these interviews, participant observations are also made in order to understand the environment in which the food service operates and to understand the actors who influence the sector. This was the second step of the primary data collection. Thirdly, the researcher conducted interviews with a group of food service stakeholders including customers, local residents, suppliers, and firms' owners, managers, and staff, research organisations, NGOs, and government agencies. These had been identified to enable an understanding of their viewpoints on the research themes (Hillman & Radel, 2018). Finally, this research archived all the essential information

to ensure the appropriate use of all the resources and to render qualitative data reusable (Kuula, 2000). In the second step, the researcher used different online and off-line sources to collect relevant secondary data, providing clear reference points. The researcher considered obtaining secondary data to answer the research question, as these resources had already been used for other purposes (Saunders & Townsend, 2016). The following section discusses the three main research strategies used to collect the primary data for this study, specifically: semi-structured interviews, focus group, and participant observation.

4.5.1 Research strategy one: Semi-structured interviews

It has been suggested that interviews are the most frequently used data collection approach in qualitative research. This is evident in the majority of qualitative studies conducted by academics (Schanes et al., 2018; Hennchen, 2019; Dyen et al., 2021; Dhir et al., 2020; Goonan et al., 2013). The semi-structured interview approach takes into consideration the fact that respondents are experts on their own experience and are therefore able to describe how they experienced a situation (Darlington & Scott, 2002). The use of interviews, usually in-depth, enables the collection of valid and reliable qualitative data relevant to the research questions of all studies under investigation; it is usually described as 'conversation with a purpose' (Berg & Lune, 2004; King & Horrocks, 2010). The researcher chose semi-structured interviews because they are flexible, allowing respondents to express themselves freely whilst also answering a series of questions which form a structure within an interview schedule (Bryman & Bell, 2007).

A qualitative research interview has the advantage of allowing the interviewer to pose many questions (Easterby-Smith et al., 2002; Jankowicz, 2005) and offer follow-up questions to elicit further information, which is not possible with a questionnaire (Hussey & Hussey, 1997). More specific probing questions, such as "can you give me an example please?" or "what do you

mean by this?" can be introduced only after essential concerns have been raised, and if respondents have not already explored them in the context of the principal subject area (Patton, 2002). In other words, as suggested by Carson et al. (2001), questioning is predicated on an interviewee's response. Follow-up questions are beneficial because they can enrich and deepen the interviewees' responses (Patton, 2002).

The researcher created a set of questions after completing an in-depth study of the literature on FW production, management, and waste reduction techniques; at all times, interview questions were also designed in such a manner to enable the researcher to respond to the research question.

4.5.1.1 Interview design

1. Interview structure

Grand tour questions (Spradley, 2016) were used in this study, starting with questions which asked participants to talk about something they were familiar with, such as themselves or their work roles and companies. They were then quizzed on a variety of aspects of the food service sector, including FW and its causes, challenges, and role players in the sector in the Garki district of Abuja. Participants were then asked for their views on the causes, impact, challenges, and approaches to the reduction of FW through the various stakeholders' collaboration in the FSS. The interview questions were designed to discuss key theoretical concepts and participants' views of the sector's management of FW. As a result, the interview questions comprise two segments: the profile segment and the empirical study theme, which has four main sub-themes (Appendix C).

Profile segment

The first segment enquired about the FS respondents' personal and business profiles. Respondents were asked to provide their personal and professional backgrounds, their experience, and knowledge of their firm.

Empirical study-theme

Sub-theme one of the surveys asked participants about their understanding of FW and its causes in the Garki district FSS. This section included questions about participants' definitions of FW, its causes, and FW handling at operational levels i.e. pre-kitchen, kitchen, and post-kitchen. Sub-theme two of the study posed questions on the approach to the reduction of FW, firstly by exploring FW dominance in the sector and the efforts already in place to reduce FW, suggestions, good management approaches, and who should play a role in the reduction of FW. Sub-theme three related to the impacts and challenges of FW, elaborating on the consequences, the challenges faced by firms, and strategies to overcome FW. Sub-theme four addressed the different stakeholder's collaboration impact on FW by exploring their capabilities and activities in handling FW in the three operational states of the food services (Figure 2.1 pre-kitchen, kitchen, and post-kitchen).

2. Interview themes:

Qualitative interview protocol is best achieved when the relevant areas for investigation are firstly structured into a theme. Hence, the interview topics were developed in accordance with this understanding to ensure the coverage of the theoretical concepts in FW reduction. However, because the focus here is on food services in the Garki district area of Abuja, the various stakeholders who are experts on this were also at the forefront of the interviews.

3. Interview administration

Interviews took place over a five-month period (January to June 2021). This was the period where Nigeria began to ease the country's lockdown resulting from the COVID-19 pandemic.

Firms had a reduced schedule at this time because the majority of business activities were just resuming, and owners, managers, and other stakeholders were available for interviews and focus groups in compliance with the social distancing rules of the COVID-19 pandemic.

The participants were initially contacted by phone, with the researcher introducing himself and explaining his role as a research student at the University of Hull, United Kingdom, and as a lecturer at the Federal Polytechnic Nasarawa in Nigeria, who is a familiar resident of Garki neighbourhood. This context was useful for encouraging the respondents' involvement because it established their trust and promoted collaboration. The researcher clarified the study's aims and requested enthusiastic cooperation and acceptance of the invitation to participate in interviews. Those who agreed to be interviewed received formal letters outlining the aims of the research study (Appendix A) and participants' consent was obtained (Appendix B). Depending on the options available and the participants' preferences, letters were sent via email, WhatsApp, and /or hand-delivered letters via a third party at the request of the participants. Some participants also requested the interview schedule, which helped them to review the questions ahead of time and gain a better understanding of the interview themes.

The interviews were conducted Garki, Nigeria. The stakeholder theory approach and the practice theory view motivated the development of the interview schedule in English. Many of the interviews were recorded.

4. Interview schedule development

The interview agenda consisted of semi-structured interview questions designed to support and organise the interview process and guide conversations with the participants. Semi-structured interviews are typically non-standardized, using open-ended questions to enable participants to share their opinions more widely and expand on the questions and issues posed by the researcher (Denscombe, 2010). The interviewer typically has a list of themes and main

questions to cover. However, depending on the organisational context and the rhythm of the discussion, the themes and questions covered, and the order of questions, vary from interview to interview (Saunders, Lewis, & Thornhill, 2012). Structured interviews, in contrast, involve maintaining strict control over the wording of the questions and responses and the order in which they are asked. Quantitative research interviews (Saunders, Lewis, & Thornhill, 2012; Denscombe, 2010) are structured interviews which are used to gather quantifiable data.

The interview schedule was firstly checked during the pilot study before the start of the main data collection in this study. The results of the pilot study were used to restructure and redefine the interview schedule, with open-ended questions being framed carefully to prevent ambiguity.

The empirical questions comprised four sub-themes (Appendix C). Before the pilot study began, the researchers' supervisory team at the University of Hull provided input and guidance in the development of the interview schedule. The pilot study also provided an opportunity to determine the depth of the research inquiry and ensure that participants understood the questions.

The researcher did not ask the questions in the interview schedule in any particular order; instead, the sequence was determined by the order in which they were structured in the schedule and the flow of the conversations with the participants. As the data collection progressed, the order in which the questions were answered became more flexible, allowing certain questions which emerged from the interviews to be asked.

5. Carrying out the interviews

Before the start of each interview, the researcher established a relationship with the interviewee by engaging in general conversation. Due to ethical concerns, digital recording of the

interviews took place only after permission was granted. To ensure participant confidentiality, the data were then backed up to security-protected storage devices. When consent was not granted, the researcher took notes during the interview, with records also taken during interviews where consent was given.

To begin the interview, introductory questions were posed; the first two were: (a) "Could you please introduce yourself to explain your education and role within this organisation?" and (b) "Could you please tell me about the nature of the FS sector in which you work?". The participants were able to go into as much detail as they wished on the questions posed and the issues they considered relevant in answering the questions, thus the depth of each response was entirely up to them. Although the researcher remained in the background, probing questions were asked at appropriate points to clarify statements and/or to inspire the participant to provide more detail.

The interviews took place in two parts of Garki districts 1 and 11 of Abuja, Nigeria. As previously explained, the exploratory process of data collection was conducted between February and June of 2021 (Section 4.4.1). Between February 2021 and May 2021, a total of 32 interviews were conducted during the data collection period within the stakeholders' groups of the FS, the majority of which took place at the participants' workplaces.

The length of the interviews was determined by the participant's availability, which ranged from 40 to 90 minutes. Four of the pilot study participants were interviewed for a second time during the key data collection; these were an academic at the University of Abuja, two restaurant owners in Garki 1 and 11 districts, and a transport manager with a large customer base. The emerging trends and concerns were shared with these participants to validate, refute, or expand on the preliminary findings. The researcher commented at the end of each interview on the problems which arose from the interviews as well as the participants' impressions. The

aim was to either develop the interview technique for the following interview or to learn more about a topic which had recently come up.

6. Interview transcription

Due to the short time frame for data collection, the researcher was unable to completely transcribe all the interviews while on the ground. However, the researcher listened to the interviews again and took notes on the emerging patterns in order to gain a clearer understanding of the data collected and to identify areas which required further detail and could be revisited in future interviews. The interviews were transcribed between March and July, 2021. The researcher listened to the tapes again after each transcription to ensure consistency and high-quality transcripts. The researcher's understanding of the data was enriched by listening to the recording several times over. The transcripts of the interviews, along with the notes taken during the interviews, provided a thorough and accurate interpretation of the participants' discussions.

4.5.2 Research strategy two: Focus group

FSS participants from various fields participated in the focus group discussion. They were chosen on the basis of their level of involvement in the sector and their residence of the two districts under study i.e. Garki Districts 1 and 11 of Abuja, and their status as professionals or business owners. Because participants express their opinions, exchange knowledge, and debate, focus groups enhance lively dialogue and contribute rich information (Kroll et al., 2007). As a research technique, a focus group enables the collection of data through group interaction on a topic determined by the researcher (Morgan, 1996); a focus group was used in this research to investigate individuals' experiences and perspectives, and also to deepen the researchers' understanding of FSS stakeholders' operations and the impacts of FW.

In each of the two selected districts, two focus groups with a similar composition of group participants were established, enabling the researcher to obtain consistent, attributed information regarding the issue (Kroll et al., 2007). Greenbaum (1988) and Morgan (1996) describe a focus group as a group of six to ten people who are strangers to one another, thus the participants in this study were divided into groups of eight from each of the Garki districts (details are in Figure 4.6).

Figure 4.6: List of focus group participants in Garki 1 and 2 districts of Abuja

Sub districts	Participants	Number in group	Date
Garki district 1	Local community residence, male, aged 62	1	18.06.21
	Restaurant manager, female, aged 44	1	
	Food supplier to schools (catering service) male, aged 42	1	
	Local food vendor customer, male, aged 52	1	
	Owner of restaurant, male, aged 58	1	
	AMAC senior member, female, aged 55	1	
	Hospital catering service manager, male, aged 39	1	
	ACCI staff	1	
	Total participants	8	
Garki district 2	Local community residence, male, aged 39	1	24.06.21
	Food supplier to schools (transport service), male, aged 42	1	
	Local food vendor customer, male, aged 61	1	
	Restaurant manager, female, aged 44	1	
	Hospital catering service manager, male, aged 41	1	
	Catering service customer, female, aged 27	1	
	Church-based charity organisation male, aged 58	2	
	Total participants	8	

Source: Author's own

Some participants did routinely interact, while others became well acquainted. They came from different food service outlets, the host community, and governmental agencies, representing primary informants and active stakeholders involved in FS, FW management and the

development of strategies to reduce FW. Smaller groups are ideal for this study because their aim is to elicit detailed information from each participant, analysing their perspectives and perceptions on relevant topics, with a high degree of participation from each participant necessitated (Morgan, 1992). Each focus group meeting was of a duration of 90 minutes to two hours. Telephone calls and personal visits were the main sources used to contact prospective interviewees and invite them to group interviews.

In total, the researcher contacted 19 people to participate in the focus group discussion to firstly provide them with a general overview of the study, after which they were invited to join the group interview. If they agreed to the interview, the author either approached them in person with the letter or sent it to them via email or telephone call to explain the study and outline the research goals, the location, and the time of the focus group sessions. However, only 16 people participated, representing eight from each of the Garki districts, as shown in Figure 4.6 above. Reaching the prospective respondents was not difficult because restrictions and other COVID-19 protocols had been eased in the two Garki districts of Abuja, Nigeria, and the FS sector had already resumed operations in the months of May to June 2021. This method allowed the researcher to introduce the study to them and make a positive first impression by treating them with respect and friendliness.

They were asked for their cooperation in order to make a contribution to the FS sector and improve FW management in the Garki districts of Abuja. Face-to-face meetings are critical for building confidence and willingness to participate in focus groups, in this case among local people in Garki districts 1 and 11. If not for this preparation, persuading participants to engage would have been challenging. The key individuals who referred the researcher to respondents were also critical in providing help and legitimacy to the study, inspiring others to participate in the interviews. This is attributable to the fact that the people of Garki are well-acquainted

with one another, as the majority belong to the same associations and have had mutual links for a long time.

Focus group sessions were conducted at two different locations. The first was in a hotel located in Garki area 1, where the owner offered the quietest place in one of their halls with seven participants; this was a welcoming environment with a relaxed atmosphere. The second session, which was held in the Garki 11 district, was at a privately-owned restaurant with six participants for two hours each, with a break in between. Both sessions took place between the hours of 12 pm and 4 pm. Tea and other drinks were served before the session began; the cost was not carried by the researcher because the host voluntarily provided the service. The participants were also served with lunch after the session ended. The researcher received support from his supervisor while the project was ongoing.

The researcher limited his interjections during each session, encouraging participants to explore and express their thoughts. By posing questions such as: "How about (name of participant), what do you think?" the researcher sought to inspire each participant to speak up and express their thoughts. Questions included: "Do you agree with this statement?" "Do you have any recommendations for me?" and "What suggestions do you have?" (see Appendix D) for the focus group interview schedule). However, different levels of communication were evident among participants, with some being reserved, and others being more articulate. Focus groups allowed the researcher to observe how various food service stakeholders interacted with each other, as well as their understanding within the sector. Compared to one-on-one interviews, focus groups provide more in-depth and detailed information (Rabiee, 2004). Focus group data was also used to double-check data from the one-on-one interviews.

4.5.2.1 Justification for focus groups and interview's

The above two research strategies were preferred to alternative strategies for the following reasons:

1. Satisfying the necessary criteria for interview strategy

The study set out to provide strategies to reduce FW within the FSS and to make recommendations on the basis of the findings. Because the aim of this study is to find appropriate answers, it is preferable to use a one to-one interview and focus group approach to do so to respond to the 'how and why' questions posed by the key research goal; questions of this type are often posed (Yin 2009, pp. 8-11), and are self-explanatory, dealing with organisational relations that can be tracked over time.

2. Achieving the research aims and objectives

Yin (2009) holds that interview and focus group strategies are useful when particular contemporary events are being investigated because they enable researchers to interview the event's participants. As a result, the aim of this study is to examine, comprehend, and analyse how FW is generated and how to reduce it from the opinions of stakeholder-practice in the FSS. As a result, pertinent meanings and learned lessons can be mapped and clarified in order to address the aim stated in Section 1.6 of this research study. The research is built on a constructivist interpretivist and inductive philosophical foundation (as discussed in Section 4.2). This meant that the key research goal was framed in this manner (as discussed in Section 4.4.1a). It was decided that an interview approach was consistent with the underpinning theory, and thus acted to study the phenomenon based on the basic fundamental principles of the research paradigm in terms of epistemology, ontology, and methodology.

3.   The opportunity to use a variety of data collection methods

The ability to work with a range of data evidence is a strength of interview analysis, as asserted in Section 4.4. (Denscombe, 2010). For data gathering and analysis, the study aim and objectives examined allowed for the use of a variety of research techniques. The research goal necessitated a thorough examination of individual stakeholder-practice views, calling for the use of a variety of data collection methods. Semi-structured interviews, focus groups, organisation web databases, and national newspaper reviews were all included in the data collection, which included a thematic analysis and analytic induction.

4.5.3 Third research strategy: participant observation

Additionally, this research used the participant observation technique to achieve a better understanding of stakeholders' roles in the implementation of food management practices, as well as how they engaged in their different roles. Observation is a data collection method which involves making direct contact with an object, usually another person. The researcher documents what was observed about the participants during the discussion session (Porter, 1996). In this study, this method allowed the researcher to obtain first-hand information and develop genuine interpretations (Rock, 1999). The researcher met important food service players in their natural habitats such as their workplaces and formal and informal settings of diverse kinds, watching their handling of food. Additionally, the researchers paid visits to several FS outlets in order to observe the types of practices which exist between and in the food services in order to develop positive relationships with these stakeholders in the study context.

4.6 Making the first contact

The researcher firstly contacted several firms via an insider who assisted with obtaining the mobile telephone contact numbers of management staff, when the purpose of the interview request was discussed. Prior to the formal meeting, subsequent communications were made via

email or phone calls. Information was provided to the participants about the study, supported by the participant information sheet after the request for interviews was granted. Interestingly, four participants from the private sector and three from academia requested a follow-up phone call about the purpose of the research, to which the researcher responded. It was difficult for the researcher to arrange an interview appointment because the dates proposed were either changed after agreement, or an agreement was given to contact the researcher again with a suitable date. Few of the respondents were able to agree to an interview date, and 19 interviews were conducted on an agreed date, while 13 respondents preferred to have an appointment fixed when the researcher was in the country; however, the researcher proposed an alternative date of arrival to the country and offered a tentative date for the interview. Another realistic consideration was the value placed on the development of broad professional and personal networks.

4.7 The pilot study

Prior to collecting the main data for this research, a pilot in-depth interview study was carried out to gather information from four participants who were drawn from different food service firms within the study context. Pilot studies are often used to ensure that a questionnaire is well-designed and capable of achieving all data collection goals of a main survey. Munn and Drever (1990) hold that pilot tests are useful in assessing the transparency, feasibility, and comprehensiveness of a survey, as well as measuring the rigour and robustness of survey methodological frameworks. To ensure the validity of responses, the sample for the pilot survey should be drawn from, or closely resemble, the actual sample of the main survey (Pole & Lampard, 2002).

This aids a researcher in understanding methodological issues such as the research objective and goals, data collection techniques, and analytical methods about which he or she was

uncertain (Yin, 2009). The process was helpful in this research in that its findings were useful in the modification of the research objectives as well as deciding whether the chosen research methodology was suitable.

The results of the pilot analysis are not the same as those of a pre-test. Here, the results are used to refine the theoretical structure and are used in the interview research findings (Yin, 2009). Because the aim of a pilot study is to refine data collection procedures and develop research design, it is important to note that the results recorded in this pilot study were not combined with the results from the main interview study. Furthermore, the study of FW in the FS sector region of Garki districts had been performed in a relatively unexplored sense, supporting the need for conducting this pilot study to recognise the effect of FW and how to minimise it prior to conducting the actual data collection. Evidence from the four-pilot study provided a key lesson on the development of the interview question guide, and challenges faced. The summary of the lessons learned is as follows:

- The pilot study provided insights into the nature of FW in the FSS in Garki district

- The quality of the information provided and the response to the call for the survey, as well as the arrangements for the pilot study, were inadequate. Hence, there was a clear need to add separate questions about the efforts made to reduce FW. This arises from respondent responses which showed that several efforts had previously been made to address FW.

- It was difficult to hold a clear discussion during the interview questions because the responses the interviewees provided to the questions were insufficiently clear. This had emerged as an issue during the pilot study's analysis, because it was difficult to codify

the data gathered on this construct. As a result, the questions on FW hotspots and causes were redesigned to facilitate a more fluid flow and improved involvement.

- Some questions were difficult to manage because the interviewees were asked about innovation in the context of food services without the researcher specifying what kind of innovation. As a result, rather than asking about innovation in general, the focus of questions about innovation should be on stakeholders' ideas for the improvement of service delivery.

- The interview's sub-themes as categories helped to create and build a theoretical framework which was found to be appropriate.

- Using the zoom platform for online interviews is uncommon; the pilot study allowed the researcher to become familiar with the protocol and how the technology worked because most respondents felt more comfortable with this application. One of the respondents was interviewed by telephone, although the resultant data recording was found to be inaccurate. For example the memory was rapidly consumed, voices during interviews were unclear, and the telephone battery rapidly lost charge. It was then agreed that a voice recorder should be used during the face-to-face interviews at the data collection stage.

- During the interviews, the researcher gained experience in dealing with participants who strayed from the subject and talked about unrelated topics.

The use of a pilot study to improve the reliability and validity of a research study has proven to be extremely beneficial. The next step is to begin the actual data collection process after the completion of the pilot interview study and the updating of the interview question guide.

4.8 Process of triangulation within the different source of data

The use of many methods and data sources to clearly understand and comprehend a phenomenon is referred to as "triangulation" in qualitative research (Patton, 1999). This has also been viewed as a technique in qualitative research for validating data by merging information from numerous sources. Denzin (1978) and Patton (1999) distinguished four unique triangulations: (a) The triangulation method is a technique used to examine the same study under consideration through several data collection methods (Polit & Beck, 2012). The use of interviews, observations, and focus groups is the often-used approach of triangulation (Carter, 2014). Typically, researchers choose data collection methods based on the question being investigated. (b) triangulation of the investigator, which entails the involvement of three or more researchers in a single study to offer multiple observations and findings. Triangulation of this type can broaden the topic of interest by providing both confirmation of findings and alternative points of view. (Denzin, 1978) (c) triangulation of theories: employs many theories to analyse and interpret evidence. Many hypotheses or ideas could be used to support or refute findings using this type of triangulation. (d) Data source triangulation also entails the collection of data from several individuals, groups, families, and communities in order to get numerous views and data validation.

This qualitative study focused on method triangulation, employing focus groups (FGs), in-depth interviews (IDIs), and observation as data sources for triangulating qualitative inquiry. Typically, interview, focus group, and observation are selected as data collection methods by researchers because they best address the research question. The interview and focus group were chosen on purpose by the researcher for triangulation, or they may have been chosen later in the study process because of problems the researcher didn't expect with collecting data.

In this study, the researcher used interviews to investigate the causes of food waste and ways for reducing it in Garki districts, Nigeria (see Figure 4.2 for a list of interview participants). The interview yielded valuable information because the interviewee was so interested in the interview and willing to respond to questions. As this is the first study in the study region to address food waste in the food service sector, the researchers believe it is necessary to verify the information supplied. Therefore, in order to acquire the best results, the researcher attempts to hold focus group discussions as a tactic to ensure data dependability and trustworthiness.

The second objective is to expand the participation of a broader range of eligible stakeholders who were unable to participate and who would be unable to participate if limited to a single technique of data gathering. In this instance, however, these three methodologies (interview, focus group, and observation) were deliberately employed only after early study results suggested a deeper comprehension of the phenomena. Three methodological observations were made about the extracted data: (a) comparing the data led to an iterative process where phenomena were looked at in depth; (b) combining the data led to a better understanding of the context of the phenomena; and (c) the convergence of the data made the conclusions more trustworthy.

4.9 Validity

The qualitative paradigm presupposes that reality is socially constructed and that it is defined by participants' perceptions (Creswell & Miller, 2000). As a result, it perceives realities to be multifaceted, interpretive, open-ended, and contextualized. Trustworthiness and authenticity are indicators of validity procedures (Creswell & Miller, 2000). Triangulation and member-checking techniques were used to increase the credibility of this research. By cross-checking data and interpretations from many sources using a variety of approaches such as documents,

interviews, and observation, the triangulation technique can increase the quality and credibility of research. Focus group observation, at various times and locations, was considered in order to corroborate particular components of the research, or to complete the information gained from interviewing (Krefting, 1990). Another important stage in establishing the legitimacy of a study is member verification. This technique enables participants to corroborate the accuracy of the data and interpretations, guaranteeing that the researcher has appropriately translated the respondents' perspectives, reflecting experiences into the data for the final presentation (Lincoln & Guba, 1985, cited in Krefting, 1990).

4.10 Discussion of research ethics

Research ethics are not associated with a specific phase of research; instead, they provide a foundation for the entire research investigation. The Ethics Committee of the University of Hull authorised this study's ethical issues as a starting point. A letter of consent was made available to all the participants before the start of the primary data collection process (Appendix B). The consent forms were checked by the researcher to ensure that they had been signed by the participants. Ethical considerations were observed by ensuring that the identities of individuals and companies engaged were retained anonymously and by assuring participants that their data would be used solely for research purposes. The researcher undertook to keep participants free from harm throughout the research period because it is essential to adhere to a research ethics procedure (Philips, 1985), and as a practice, ethical consideration should be followed at all stages of the research process. In order to clearly provide a good understanding of the ethics process and to demonstrate adherence to ethical practice, the researcher included some ethical consideration steps to be followed in this study.

Firstly, during the empirical research phase, the researcher studied the pertinent literature to this study with close attention. In order to further the research process, it was essential to

carefully analyse sources and not misrepresent material, such as when communicating with organisational sources, extracting data from reports, generating diagrams, or evaluating outcomes. Specifically, the researcher is well aware of the repercussions of copyright infringement and has adhered to the Data Protection Act of 2018 by ensuring that this work is free of plagiarism, also providing appropriate references throughout the study.

At the primary data gathering phase, the researcher ensured that ethical considerations were maintained in an ethically responsible way (Bryman & Bell, 2007). All participants were recruited by the researcher and were granted access to the interview location so that they could observe the food service stakeholders' everyday activities, conduct semi-structured interviews with them, and document their life story in relation to food waste management. Throughout the process, the researcher evaluated the individuals' values, religion, time usage, and location. The researcher carefully revisited and outlined participants' rights and responsibilities; for example, all respondents had the right to refuse to answer, and/or to discontinue participation in the research process (Saunders et al., 2011).

During the observation procedure, participants completed a consent form, as with the one prior to the interview, indicating their full agreement to consider what they do as a food service firm, also providing access to their daily routine. Throughout this process, the researcher paid attention to the participants' priorities, such as their break time and other personal obligations, including the need to meet children from school. Due to the researcher's common background with the subjects, the participant observations were conducted without the interruption of third parties. For example, participants alerted the researcher when customers and other parties required their attention during the course of the session. Thus, the researcher ensured that all participants understood events during and after data collection.

Before each semi-structured interview, the researcher telephoned the participant, confirming their continued willingness to participate in the interview sessions and obtaining their agreement to the interview schedule. An information sheet compiled by the researcher was delivered to each participant; the information contained details of the interview and explained how the study's findings would be used. To maintain standard ethical practice with the participants, the researcher provided contact information to each one, storing the information in a secure database. In a few instances, the researcher recruited an interpreter who was able to translate into the Hausa language, the dominant language of northern Nigeria and one of the country's principal languages. Although the researcher has a good understanding of Hausa, an interpreter was used to avoid misrepresentation. Because the main part of this study was carried out in English, the researcher translated all of the interview transcripts into English.

While conducting the interviews, the researcher ensured the immediate, complete and safe storage of information provided, preventing the possibility of unauthorised access to the material (Schutt, 2004). In addition, the researcher meticulously ensured that all electronic equipment and documents were stored securely, preventing the availability or use of the material for any other reasons than those for which the ethics were approved; any unnecessary photographs or videos were also immediately deleted.

Determining validity in qualitative research is challenging on multiple levels. Validity is concerned with the reliability of a research or study and its authenticity (Creswell & Miller, 2000). Academics have established several approaches used to establish validity in qualitative research (Lincoln & Guba, 1985). Still, Creswell and Miller (2000) cite the use of member checking, triangulation, solid description, peer review, and external audits as qualitative research approaches employing a narrative methodology.

In this study, the researcher utilised triangulation and member checking to establish the integrity and validity of the data. Triangulation is essential for improving the quality of research by assessing and presenting results from several sources, such as documentation, interviews, observations, and focus groups, in order to confirm certain parts of the study (Krefting, 1990). A member-checking technique ensures that the data is correct and renders it easier to understand its meaning; this ensures that the researcher has accurately recorded the opinions and experiences of the participants for the final presentation (Krefting, 1990).

4.11 Limitations of methodology

4.11.1 Limitations of focus groups

Focus group strategy may have significant limitations when it comes to collecting rich data; for example, group members may influence one another, while others may be too uncomfortable to share their opinions to the group (Hesse-Biber & Leavy, 2004). Furthermore, some individuals may be more active than others, while others may participate less in the conversation; the success is largely reliant on the skills of the interviewer and/or ability moderators to elicit group engagement. As a result, a researcher should be cautious in their approach to the questions they ask, avoiding questions on sensitive topics. Before starting the focus groups, the researcher was required to be well-trained as a discussion facilitator.

4.11.2 Limitations of semi-structured interviews

Participants' unwillingness to provide rich and in-depth information or to allow their interview to be used in the research are two potential constraints of a semi-structured interview. Participants may not be able to provide all necessary material in depth due to the time constraints. As a result, it is essential to establish a connection with important participants and to thoroughly prepare questions and interview tactics.

4.12 Analysis of qualitative data

It was not the frequency of the themes detected, but their link to the research questions which influenced the researcher's selection of themes from the data (Braun & Clark, 2006). The original aim was to use the NVivo application for the analysis, although due to an insufficient understanding of the dynamics, manual thematic analysis was used instead; this is usually carried out in qualitative research (Braun & Clark, 2006). The transcripts were printed and classified by marking the themes as they appeared in pencil. Data were coded and analysed to produce concepts and relationships (schematic analysis) between concepts (thematic analysis) (Verrynne, Parker, & Wilson, 2013). The second phase involved continued coding (Bazeley & Jackson, 2013), which featured creating a systematic coding system (thematic framework) representing the primary topics and sub-themes of the study. This whittling down resulted in 'conceptual clarity' (Bazeley & Jackson, 2013). While the literature provided the background for the theme, this approach also allowed for the discovery of new concepts based on the data, representing inductive reasoning.

Although it took significant effort and time, this strategy allowed the researcher to become more involved in the data, discerning the tone of each theme as it was expressed by the participants. The researcher understands that meanings are established through contact and contextually produced as they are shared among members, which aligns with this study's philosophical perspective. The intended research questions were answered, although the researcher's curiosity was provoked regarding the implications of the data. The researcher sought to be aware of emerging themes by paying attention to the flexibility of responses and the wider range of perspectives which arose (Noaks & Wincup, 2004). The replies were grouped into themes which were relevant to each study topic, and the process of completing the data transcription process took two months.

The researcher listened to the recorded responses before starting the thematic analysis to become familiar with the vocabulary and tone of the responses. The content of fieldwork journals was also reviewed to consider what was stated through body language. The transcripts were then reviewed line by line, with any themes emerging from the data being noted; for example, if a participant publicly discussed FW at various stages of the cooking process, this was recorded as a cause of FW. The main themes of that dialogue segment were then recorded at the foot of each page. The sub-themes which had developed from the comprehensive analysis were revisited and grouped into broader themes to help the researcher to answer the research questions.

Some participants used pidgin English during focus group discussions, while others used standard English; many Nigerians use pidgin English as a medium of informal communication and organisation. During the analysis, some of the pidgin English responses were translated into more conventional English to support reader's comprehension. However, where it was vital to retain the original sentence to communicate a message to the reader, these were recorded as pronounced.

Visual data was also useful in providing depth and meaning to the arguments, and the photographs of participants and their environment were taken with consent as mentioned in the consent form. All participation was voluntary as it allowed for the use of their narrative and visual evidence. Their identities were protected as pseudonyms were used throughout the discussion. To strengthen the understanding of the food service stakeholders and food practices, the research was guided by the interpretivist paradigm. This study applied a visual ethnographic approach (Rajoana & Saxena, 2022) as an additional layer (insufficiently used in food sector research). even though studies have shown that visual ethnography is a practise that is multidisciplinary in nature (Pink, 2013). In the discussion of the findings, the use of visual

data gave rich insights that would have been hard to get without the photograph, which is often how ethnographic studies are done (Ayala & Koch, 2019).

4.13 Chapter summary

This chapter explored the philosophical paradigm, research methodology, and research strategy used in this study. The research was notably guided by the discourse on critical realism, which shares a common ontological and epistemological viewpoint. Critical realism helps in the comprehension of the significance of food waste control in the Garki districts food services of Abuja. After analysing the fundamental philosophical assumptions, the following section explored the data collection methodologies. This study primarily adopted a qualitative research methodology to understand the complexities underlying the causes of food waste and the means by which this could be addressed from the perspective of stakeholders' activities. The subsequent part elaborated on the methodology utilised to collect data through semi-structured, observational, and focus group methods, and also detailed the process of data analysis. Using their repeated observation in the empirical data, the emergent characteristics and patterns in the data were grouped in order to discover the reasons, obstacles, and strategies for reducing food waste. These highlighted themes are addressed in full in Chapters 5 and 6

Chapter 5 A perspective on stakeholders' perception of food waste

"Don't waste food, someone is sleeping on an empty stomach" Omer Syed

This chapter discusses the findings and analysis of the semi-structured and focus group data obtained by this study. Using thematic analysis, the data from the research instruments used were analysed, with the data being further categorised and reclassified according to emerging codes and themes, and then compared continuously across all interviews to identify important patterns or themes. The identification of twelve causes of food waste (FW) was the result of a

thorough process of examination and consolidation of data in pursuit of a comprehensive interpretation.

The nine emerging causes of FW which categorise the findings are: (1) communication among stakeholders, (2) management practice, (3) lack of re-use of surplus food, (4) professional cooking skills, (5) competitors, (6) diners' values and attitudes, (7) lack of use of integrated technology, (8) food handling skills, and (9) inaccurate forecast of demand. However, despite these challenges, the findings indicate potential growth and development opportunities for FW route identification and a growing understanding of the implications of waste for the food service sector. This could help to raise awareness of the relationship between FW and the adoption of sustainable food practices.

5.1 Garki's food service sector and stakeholders' profile

Food services in Garki, including specialised outlets providing food for people outside their homes, date back to the eighteenth century when street vendors were among the first to provide meals to industrial shift workers who were unable to meet the meal schedules of their boarding-houses, pubs, and other dining establishments. The lunch cart was invented by Walter Scott in Providence, Rhode Island, in 1872, replacing early street vendors who sold sandwiches and other basic foods from baskets. Innovations have led to the continued expansion of this list of practices (Saksena, 2018). Over these years, Garki has continued to accommodate an influx of foodservice vendors, with the formation of agencies and by successive governments and an increase in business activities within and around the city capital where Garki is located. Garki is a predominantly business district; those who work there do not live nearby, hence the necessity to eat away from home.

"The numbers of government parastatals and private companies have continued to multiply simply because of the expansion in government activities, so the number of hospitality sector and food service outlets has also continued to increase".   (Customer of a local vendor at Garki, aged 41).

The manager of a restaurant in District 11 reports that the increase in the demand for food services has continued; he suggests that safety fears in rural areas play a role in the rapid development of urban cities such as Garki, which has changed the nature of business activities with an increased demand for food services for people eating away from home.

The Garki FS sector is well-structured and provides an income for the various owners (profit) and services to staff and organisations (not for profit). This finding corresponds to the Waste and Resource Action Programme (WRAP)'s study and other scholarly work which divides the FSS into two elements. The first is the profit sector environment; this includes restaurants, cafeterias, fast-food restaurants, take-aways, canteens, bars, and catering within supermarkets. The primary functions of these businesses are food service and profit maximisation (Sundt, 2012; Oliveira et al., 2016). The second one is the cost sector, which comprises schools, universities, healthcare settings, correctional centres, and staff catering (Dhir et al., 2020); this is operated from premises owned and operated by third parties to provide service to staff or other users such as hospital patients and students (Oliveira et al., 2016).

"We run a food service business, which is to help provide for our family and send the children to school. My brother and I are not educated and had no support for school attendance. Hence, we cannot afford not to work, and we send our children to school". (Family-owned canteen manager, male, aged 49).

The majority of food services are privately owned. This is a sector in which the government and its agencies have traditionally shown little interest, hence the dominance of private individuals who jointly- or privately own the various food service outlets. Moreover, most interviewees acknowledge that the sector is one of the fastest-growing in the Garki district, enabling opportunities for families, private individuals, and investors to provide for their families. For example, a local interviewee proudly reported that:

> "We have all kinds of food services here, where we can just walk down the road and eat what we like at different prices depending on our wishes". (Local community resident, male, 61).

The nature of the FS sector determines its accessibility; the businesses in the sector are of small medium-, and large-scale, providing support for general economic development (Sanni, 2009), and that of Garki in particular. The FSS offers employment opportunities, contributing to national GDP, thereby increasing earnings through taxation as a revenue source.

> "I have worked in this restaurant since I graduated from university. I have looked for work, but no one is willing to employ me, so I decided to work for the food restaurant in this hotel; as you can see, it is busy. Can you imagine that most of us working here are family people and earn our wages from this hotel? It is a huge industry" (Hotel restaurant supervisor, female, in her 40s).

Another interviewee addresses this issue, explaining:

> "Without the food services around, the crime rate would be higher, but due to the large numbers of young people who are employed there is relative peace in Garki" (Hospital canteen manager, publicly-owned organisation; female, aged 45).

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This is supported by another interviewee, who also addresses the positive aspect of growth in the food services sector of Garki district:

> "The expansion in the number of food outlets has made food much more affordable whatever your purchasing power, also creating employment. Can you see how many food service employees there are? You see very few staff idle" (Cafeteria chef, male, aged 51).

The FS sector is widely recognised as the economic backbone of the hospitality industry which includes restaurants and food outlets, generating some USD$1.3 trillion in 2012, primarily through patronage (Babalola & Oluwatoyin, 2014; Baker et al., 2000). There is little doubt that FSS constitute the global hospitality sector's key drivers. The United Nations World Tourism Organization (UNWTO) reports that between 70% and 75% of foreign travellers annually spend the majority of their money on culinary services (Akpabio, 2007). Consequently, the industry is of vital importance to the national economy, with foodservice businesses such as catering, fast food outlets, clubs, and snack bars being features of hospitality services and tourism, providing accommodation, banquet halls, and event tents (Adeola & Ezenwafor 2016). The Garki district of Abuja has clearly benefited from the FSS with economic development through tax receipts, job creation, social life opportunities, improved presentation of the areas, and fast-food consumption. As mentioned earlier, both the food service's profit and cost aspects play a significant role in FW generation and their mitigation for food sustainability (Sundt, 2012). Both districts of Garki I and II share similar characteristics (Table 1.1, Chapter 1).

There has been increased growth in food services, calling for the continued patronage of customers who eat away from home. Therefore, stakeholders have shown an interest in finding a solution to the issue of the FW generated. Garki hosts activities of various kinds, which require people to eat as they circulate carrying out their everyday activities; the predominant

activities in the area are listed in Table 1.2. Because the sector plays a role in local, regional, and national economic development, governmental and private initiatives have been introduced to support the sector's development. In recent years non-governmental organisations have sought to address the issue of food waste, such as community-based organisations (CBOs), civic society organisations (CSOs), and faith-based organisations (FBOs) such as churches, faith organisations, and other non-registered bodies. This study included the majority of the stakeholders in the discussions to gain an understanding of the roles played by the participants in the FS sector in restaurants, catering services, canteens, local food services, and cafeterias. The roles they play justify the inclusion of this set of actors in this study.

Table 5.1: An overview of key food service stakeholders' profiles

Food service stakeholders		Role in the FS sector
Public		
	Abuja Environmental Protection Board (AEPB) and Federal Environmental Protection Agency	Statutorily tasked with the protection and management of the FCT Environment in which Garki is located. Protection includes ensuring that the environment is not littered by food waste, and that hazardous substances which can also emanate from FW are disposed of appropriately.
	Research and academia (University academics)	This includes research institutes/organizations, universities, colleges of education, and polytechnics which study the overall impact of solid waste.
	National Agency for Food and drug Administration and Control (NAFDAC)	The agency regulates and controls the production, export, import, advertising, distribution, sales, and usage of food, pharmaceuticals, cosmetics, medical equipment, chemicals, and packaged water. It is also responsible for overseeing food service businesses nationwide.
	Abuja Municipal Area Council (AMAC)	Responsible for the inspection of stores and checking whether food products are approaching the end of shelf life and/or expiration; also has oversight of other food services within the Garki area of Abuja.
Private	Abuja Chamber of Commerce and Industry	1) Created in August 1986, the Chamber operates as a centre for business information, support, training, guidance, and conflict resolution for members of the FCT. 2) The Chamber has constructed and maintains a database of business information, support, training, guidance, and dispute resolution for members of the FCT.

		3) The Chamber attracts investment through effective networking and proactive business strategies.
		4) The Chamber works in collaboration with the legislative and executive branches of government to develop quality thinking and action, using its influence when appropriate, and providing value-added services to its members.
	Consumer and market associations	These reflect the interests of consumers and suppliers, who are the FS sector's primary intended beneficiaries; they include market managers and consumer organisations.
	All Farmers' Association of Nigeria (AFAN)	Has it headquarters in Nigeria's federal capital, Abuja, and branches in the 36 states of the nation and 774 local government areas of the country. Its mandate is to provides sustainable agricultural support, leveraging human and physical resources, and connecting with rural smallholding farmers to cultivate ideas for sustenance growth.
	Hotels, Restaurants and Caterers (HORECA)	Represents businesses, institutions, and organisations which prepare meals for consumption outside the home; it comprises restaurants, cafeterias in schools and hospitals, and catering services in various formats.
	Food processors/manufacturers	Provide external support to the food services sector through the provision of raw materials and other upstream services of the supply chain.
	Food produce transporters/Nigerian Union of Road Transport Workers (NURTW)	Support in the movement of materials, food from the upstream through the entire chain of the supply. Majorly as a distribution mode to the consumers or customers such as in the case of catering services to schools and other governmental non-for-profit purposes.
Non-Profit	Non-governmental organizations (NGOs)	Examples include community-based organizations (CBOs), civic society organizations (CSOs), and faith-based organizations (FBOs).

Source: Author's own

The wide variety of stakeholders involved in food service operations and the management of the sector require their collaboration. The public sector, such as universities, needs to carry out research on the various challenges facing the food services industry, with a view to making recommendations. The environment has been polluted by the inappropriate disposal of food waste, which has become a challenge to the community. It is the role of the Abuja

Environmental Protection Board (AEPB) and the Federal Environmental Protection Agency to ensure that appropriate disposal takes place.

However, there is no evidence of the involvement of these agencies in the disposal of waste within Garki. The Abuja Municipal Area Council (AMAC), which oversees Garki's administration is charged with checking on the operations of food vendors and possible challenges; however, it has failed to discharge these responsibilities because it is more interested in political activities than governance. This chapter and the following one provide a detailed account of stakeholders' roles in the reduction of FW and its mitigation in Garki districts. There are concerns that food waste, if not reduced, could affect the sector's sustainability, in terms of environment, economy, and social impact. Therefore, there is a need for the increased improvement of FW management strategy in order to positively influence the community and provide food to the growing population of Garki district.

5.1.1 Overview of stakeholders' perceptions of food waste in the Garki districts

A common tension in any sustainability governance initiative is defining the nature of the system that is to be governed (Ostrom, 2011). Garki's food outlets require a system which allows for improved food service and the application of a local food management system; this is then dependent on the compatibility of different actors' ideas of what the sector is, what it includes, and what it does not. The majority of the interviewees responded to the question of their views on 'food waste', providing a response based on their individual view of what FW is, how they have managed FS sector waste within their individual services, and the perceptions of the external stakeholders of food waste. In this vein, some stakeholders described a food service system as a structure which operates as a 'food away from home' service. Stakeholders' views are regarded as being important in order to aggregate opinion on the phenomenon of

food waste. Stakeholders were classified into unique profiles according to age, gender, service provided, position in the service, and base sector. Furthermore, stakeholders' perceptions of FW according to profile were summarised, with key points highlighted. This provides a unique insight into the discussion in a variety of ways, as among other reasons, it provides a gender- and age-based uniqueness to respondents' perceptions.

Table 5.2: Summary of stakeholders' perceptions of FW according to profile (age, gender, service provided, position, and sector)

Profile	Stakeholders' perceptions of FW	Key points
Age range: 25 - 40 41 - 56 57 – 72	All stakeholders have a clear understanding of FW regardless of age. However, those aged 41 - 72 clearly express their understanding on FW as food not consumed and thrown away by vendors, with a specific example being local food vendors. "I am a regular local food vendor customer; I see a lot of food wasted" Male, aged 24. This age group does little more than buy more expensive food from the more modern outlets, unlike the younger age group who have many friends and enjoy more social outings, thus positioning their view of FW on that which occurs in a restaurant or canteen.	Older people patronised local vendors more than younger adults, for reasons of cost and taste; they preferred 'local flavour'. Respondents in the lower age range engaged more with the issue of waste generation.
Gender: Female Male	The male respondent was less engaged in the focus group discussion, and focused more on the pre-kitchen and post-kitchen operational stages of food service, paying attention to waste at the kitchen stage where operations take place. Males are less visible in the kitchen within the sector, as it is usually seen as females' responsibility to carry out more of the kitchen activities. One of the respondents, a male aged 34, said:	Females were more involved in the kitchen stage, while males were more involved in the pre- and post-kitchen stages.

		"As a canteen manager, I often monitor FW to make sure that it is reduced. I know it may be more in the kitchen, so this is an area I need to do more monitoring". The pre-kitchen stage, which generally accommodates the supplier and distribution, has the majority of male counterparts.	Females initiated more conversation regarding FW than their male counterparts. Away from home there are more females involved in waste generation than males.
Services: Restaurant Canteen services Local food vendor Catering services Transporter Policy official (AMAC) Education/researcher Government agency (waste manager) Private initiative (activist)		The restaurant manager believed that FW in a restaurant's location increased due to a lack of collaboration and communication skills of kitchen staff to develop the capacity to address waste issues. Local food vendors, despite being disorganised, generate less FW; they serve meals in smaller multiple portions which are wrapped, enabling customers to choose and eat a single, individual portion. This system does not, however, work for socially-conscious groups of young people who believe that it is less acceptable to eat in local places. Catering and canteen services, like restaurants, generate significant FW as a result of food transport and handling, and most of their staff are not well-trained in food handling and management tasks.	More FW is generated in restaurants, canteens, and cafeterias due to strong demand by young people and a lack of staff skills in food handling. Older adults patronise local food vendors because they believe that this represents the local flavour and state. Hence, their view of FW is more based at local level.
Position: Firm employee (manager owner/supervisor/chef) Supplier Local resident Govt/NGO		Both districts' stakeholders considered FW routes for identification and reduction. From firms' perspective, FW was primarily regarded as an economic challenge, while local residents, customers, and NGOs relate FW implications more to environmental challenges and social implications for the population. The suppliers believed that FW has economic and social implications because it limits the business activities which can take place.	The participants' view on FW was expressed not from their general knowledge, but from a firm-based perspective. As a result, their point of view reflected their understanding and worldviews on food waste.

Customer Regional director Independent researcher		
Food service sector: Cost sector (public) Ownership Profit (private ownership)	FW generation is more prominent in the private sector as there is a higher volume of activities within the sub-sector, leading to more food waste. The public sector is limited because it lacks government supervision, hence its existence is less visible within the sector unlike the private sector where over 2/3 of the FS sector workforce is accommodated.	FW generation is pronounced and more evident in the private side of the service sector. This results from the high level of customer patronage and suppliers of food traffic.

Source: Author's own

From this overview of the summary of stakeholders' perceptions of FW according to their profiles (Table 5.2), the various stakeholders' perceptions of FW generation and challenges differ slightly in terms of their understanding of how it occurs and its implications for the sector. Age, gender, occupation, sector, and position all influence their views on FW within the FS sector.

For example, the grouping by age provides evidence that respondents in the lower age range engage more with waste issues (Quested et al., 2013; Visschers et al., 2016), and are less familiar with waste prevention strategies. FW behaviours have been associated with certain characteristics, social context, and situational factors (Betz et al., 2015; Lorenz et al., 2017b; Lynhurst, 2013). Although it is unclear how gender as a characteristic interrelates with food waste, studies evidence the fact that women have greater control of FW within the domestic context of food management research into FW reduction (Graham-Rowe et al., 2015), with lower reported FW amounts (Visschers et al., 2016). Some academics conclude that, when eating away from home, women are more inclined to waste food than their male counterparts (Betz et al., 2015; Lorenz et al., 2017a).

In commercial and collective catering Lynhurst (2013) conducted research into the restrictions and motives of consumers to reduce waste. According to the findings of this study, 33% of respondents admit to leaving food on their plates at the end of a meal, with women and younger people most likely to do so. Gender effects on self-reported FW (Betz et al., 2015) and visually assessed FW (Lorenz et al., 2017a) show similar results, although the influence of age is emphasised in self-reported data (Lynhurst, 2013), and has yet to be statistically proven using observational data.

5.2 Theorising food waste from stakeholders' perceptions

FW is defined as edible and perishable food that is discarded due to operational inefficiencies or irresponsible behaviour on the part of food providers or customers (Filimonau & Coteau, 2019). Dhir et al. (2020) define FW as food intended for human consumption that is not consumed, the redirection of food for animal consumption, or the waste of edible food. It consists of edible and inedible food components that have been removed from the food supply chain and can be recovered, or disposed of responsibly. Garki foodservice has experienced an increase in food waste; this is due to the nature of business and the increased mobility of the population. When away from home, people seek pre-prepared food for consumption, which is referred to as: 'eating away from home'. Several views were canvassed on the meaning of the term: 'food waste', which is associated with food no longer fit for human consumption.

Although the definition is limited in scope, it provides a background for a better understanding of FW. Firstly, all 32 interviewees agreed that FW is the loss of food which was intended for human consumption, but was discarded because it is no longer safe. The interviewees were asked to discuss their understanding of FW in the context of food service. The majority of the participants described FW as food originally prepared for human consumption which becomes inedible. Several of the interviewees' firms (13, 16, 18, and 24) expanded the description to include: 'allocated to other purposes, such as animal feed and disposal'. This is consistent with the view of Filimonau and Coteau (2019); their view further suggests that FW is widely-accepted to occur within the food service sector. A female school canteen supplier aged 45 describes it:

> "FW is produced every day within the sector. Every stakeholder sees how it
> develops. It seems scary because food meant for customers ends up being

thrown away and fed to animals. This is a loss regardless of the fact that it was not originally meant for animal use. Nevertheless, the majority is thrown away".

Hence, this understanding of the meaning of FW by the interviewee solved the problem of struggling to provide a background idea for the investigation and meaning of FW in the broadest sense. A clarification is made by the fact that participants provided the understanding that, when food is no longer edible, it is classified as waste. Participants' views of FW were based on their own experiences with the type of service they work for. However, as a group, they have a complete understanding of FW because they all have important things to say about this topic and themes.

When interviewees were asked whether FW was acceptable to them, their response was affirmative:

> "It is unacceptable because people's health is affected, businesses are losing out, and people are dying because of a lack of food to eat". (Male vendor of local food, aged 41)

> "Many children and elderly people are unhealthy because of poor or insufficient food. In fact, no proper society should accept FW as part of the system. This should be addressed with all seriousness". (Local community resident in Garki District 1, aged 42).

Expatiating on the fact that FW is not acceptable, another interviewee asserts:

> "You are discussing this topic as a researcher because you are also aware of the dangers. How can FW be acceptable when we, as businesses, know what we lose out every day?" (Male hotel kitchen manager, aged 68).

FW generation has been suggested to occur in different aspects of the food service sector. Despite growing concern about the consequences of FW, there has been a consistent increase in amount of avoidable food waste before, during, and after the kitchen stage, requiring various stakeholders to record it and propose ways of reducing it in the food service and along the entire supply chain, particularly in the downstream sector. FW is not in any way seen as something which can or should be allowed to continue, as it is not accepted as a practice in foodservice. A restaurant manager, female, 44, in Focus Group 1 spoke in an unconventional form of the English language, which is used in Nigeria for communication.

> "People are hungry. Why do we go back and throw food away again? Hunger dey for the land now…. if we accept the increase in FW, then we will soon wake to see no food service outlet here in Garki is in the market and society will see a social and health crisis" (Summary of discussion focus group Garki district 1. The interview was conducted on 18th July 2021).

All participants in Focus Group Garki 2 concur that FW cannot be allowed to continue and that not taking action against the continuous production of waste could lead to more hunger and loss of resources and a decline in the growth of the industry.

> "The way and manner in which the industry is managed does not provide much hope for the avoidance of waste; therefore, expected government intervention and policies should address the inadequacy of the sector. I am unsure that the government knows it responsibilities". (Summary of discussion Focus Group Garki district 2. The interview was conducted on 24th July 2021).

Focus group participants believe strongly view that FW should cease, and that the waste generated has affected the industry.

"I am happy that this kind of discussion is taking place. I hope that we will find solutions to the growing amount of waste" (Local food customer, male, aged 61), "I have lost a lot over the past few months". (Restaurant manager, female, aged 44, and a catering service customer, female, aged 27).

5.3 Garki stakeholders' views on the causes of food waste

All interviewees in this study participated in the interviews to discuss and provide their own views of what they think FW means. Regardless of the nature of their services, participants linked an understanding of FW to the activities which occur within the sector in terms of handling at every stage of the supply chain, in this case, the downstream. The downstream end of the supply chain, to which foodservice belongs, has been found to produce significant food waste. Most studies shown that the main types of food wasted are perishable food items, representing the largest proportion of FW (Parfitt et al., 2010), including fruit, tomatoes, paper, meat, dairy including milk and cheese, and cooked surplus food.

"The term: 'food waste' refers to the initial provision of food for human consumption culminating in non-consumption purposes. It is primarily intended for human consumption, but is ultimately allocated to other purposes, such as animal feed and disposal. If the purpose of consumption by humans is not achieved, then it is a waste" (Summary of the discussion Garki district 1 Focus Group. The interview was conducted on 18th July 2021).

Defining food waste was not challenging for members of Garki District 2. All of the ideas suggested for FW provide many meanings which align with the general description of waste in the context of food, although this was too narrow for the discussion. The focus of the definition was divided into two; firstly, FW is that which can no longer be consumed by customers and is to be disposed of. Several participants gave a further description to include:

"I have read and understood that food waste refers to the disposal of prepared, food for human consumption which was later confirmed to be spoiled and should be disposed of. FW could still be useful for other purposes such as landfill, animal feed, and soil nutrients" (Summary of discussion Focus Group Garki District 2. The interview was conducted 24th July 2021).

In the pre-kitchen, kitchen, and post-kitchen stages, there are many activities which generate waste; these include buying food, preparing it in the kitchen, and serving customers. The majority of participants contended that the attitudes, behaviours, and knowledge of food service actors are the major causes of FW. During the discussions, participants' perceptions of the causes of FW appeared to focus on stakeholders' food handling methods, their attitudes towards FW management, and their willingness to mitigate FW within food services. Participants believed that everyone involved in foodservice sector activities could play a role in its reduction, and this influenced their views and behaviours towards FW.

There are causes of FW evident in the food services sector in Garki district, which require examination in order to identify sustainable solutions. The causes identified by this study are listed in Table 5.6, with some elaboration from the stakeholders who are actively involved in the sector's management and likewise carry out the day-to-day operations of the food services sector. The role or practices of stakeholders lead to the growth of FW, as mentioned in the list of responses provided below. The causes of FW identified in Garki districts in the interviews were similar to those expressed during the focus group discussion. In Garki District 2 interview transcripts identify the leading 'causes of FW' within the FS sector as poor handling of materials, unsuitable storage facilities, inappropriate food menu handling, the nature of services for customers, a lack of staff experience in food handling, and inadequate motivation in terms of training and recognition.

However, the leading cause of FW is inadequate communication and information sharing amongst all stakeholders. The eight participants shared a common understanding of the causes of FW because they held similar views on its causes; they interacted freely on each of the points raised by group members.

The view of the entire group of participants from Garki District 1 was that FW is generated irrespective of the type of service rendered. Waste is caused by poor handling of materials and processes prior to food consumption. The method and practice of food handling are essential for the avoidance of waste. This begins with the procurement, storage, processing, and distribution of food to customers. Other reasons cited for FW include excessive portions for customers:

> "Sometimes customers insist on what they want and will not take advice; they believe it is their money, but we know when they order food that they will not be able to finish it, recommending that they take a smaller portion and come back for more if they need it. This is difficult for them and it leads to surplus food in most cases; I have advised them so many times, but the customers do not listen, insisting that it is their money" (Summary of discussion Focus Group Garki District 1. The interview was conducted on 18th July 2021).

> "If communication and information is lacking, I cannot see how the business will survive. This is the root cause of FW, so firms should have open communication especially with their workers if they want to decrease FW and increase their patronage" (Summary of discussion Focus group Garki district 2. The interview was conducted 24th July 2021).

"… although I can't understand why kitchen staff drop ingredients everywhere without considering their reuse; usually when cleaning the kitchen you find out that a lot of waste has to be taken out. I believe that this is due to lack of adequate training" (Summary of discussion of Focus Group Garki District 2. The interview was conducted on 24th July 2021).

In both developed and developing countries, portion control has been proven to be unpopular (Filimonau & Sulyok, 2021), in part because customers are not informed that they can purchase less food at a reduced price (Filimonau & Ermolaev, 2021). This study indicates that portion management may be an effective method of reducing plate waste, which is consistent with earlier research conclusions on food waste prevention strategies in the FS industry. However, this is contingent on a well-developed conversation with customers regarding the benefits of managing portion size and how it applies to customers financially.

Food waste reduction could also be realised in developing nations such as Nigeria based on the nature of their existing communications practices, which influence the amount of kitchen, buffet, and plate waste. Without effective communication, information is not exchanged and work becomes harder, which impacts the way in which staff interact with clients. Communication is essential between suppliers and customers regarding orders, as well as among employees within an organisation.

The findings suggest that kitchen waste can be reduced by enhanced communication when, for example, complaints are made about low-quality products, or in response to inadequate or incorrect portion allocation. Appropriate portion sizes, which impact plate waste, require communication between the person placing an order and the provider, such as a service kitchen which orders meals from a central kitchen. The results highlight the importance of information sharing among employees inside an organisation. For example, information regarding soon-to-

expire products, expiration dates, and spoilage influence product rotation and prevent the use of expired products. Communication with customers occurs, for example, when there is a need to educate them about the contents and/or nutritional value of portions and meals (products), or in a school or nursery setting in which children are instructed on good mealtime behaviour. If a business so chooses, customers can also be informed about food-related matters such as the environmental impact of their meals. Understanding customers and communicating with them are essential to generate and increase customer satisfaction.

The study reveals that a company's communication channels should be opened if it is to reduce waste and grow clientele; it is also essential that employees know where to locate the information they require and whom to ask. Preparing the appropriate amount of food can have a direct impact on the amount of food wasted (Heikkila et al., 2016). The practice of ingredient allocation is predominantly characterised by routine and embodied tasks. The skill is acquired through repeated practice throughout a cook's apprenticeship and later in their professional career (Hennchen, 2019). Through repeated exercises, experts become more attuned to the appropriate allocation and use of ingredients, as well as the slicing of food.

As a result, the practice of eliminating waste is enhanced, and the allocation of resources requires less time and greater precision. The quality of enhanced resource (ingredient) allocation in the kitchen, as explained by an interviewee, cannot be captured in written documentation. The stages of production and cooking in which meat, vegetables, and other degradable items are used were identified as food hotspots. The majority of participants felt that the approach of kitchen staff to food-related concerns requires additional support and training. The leading sources of food waste are the washing of vegetables, excessive use of cooking oil, improperly sized meat cuts, and loss of freshness of perishable items. FW hotspots vary according to the type of food service.

It was reported in the Vanguard on June 23rd, 2021 that, in order to decrease food waste, there is a need to invest in technology, training, and innovation, changing in the behaviours of all major stakeholders in the food service industry. The view expressed by Olubiyi in this newspaper column is consistent with that of the respondents in this research study, who stated that training and investment in the industry are crucial. Cubing waste is necessary at all stages of food service operations. Moreover, investment was proposed in cooling and refrigeration equipment for perishable fruit and vegetables such as tomatoes. Ecotutu, a Nigerian start-up which has devised a solution to the problem of food waste, is among many to consider this approach; due to the frequent power outages, it offers solar-powered cold storage facilities to enterprises.

> "We are a big restaurant with all-day service. Where we have a higher demand in terms of customers and the pressure is on the kitchen staff, we do record significant waste. I believe that this is due to a lack of experience and/or training in food handling. We have recently had to employ a FW manager within the kitchen service" (Summary of discussion Focus Group Garki District 2. The interview was conducted on 24th July 2021).

All the Garki District 1 group participants expressed the view that major food waste hotspots are at the kitchen stage, in the course of activities by kitchen staff. Behaviours and skills were cited as the major causes of waste in vegetables, raw meat, and lost food ingredients; this supported their position regarding behaviour and handling. Participants did not disagree with the routes of food waste mentioned, although several made some amusing interjections during the conversation:

> "…During cooking, staff need to look at what they are doing otherwise they will end up allocating resources to the wrong place, which will stop the food from

being edible, and mean the taste will be badly affected. A lot of meat has been lost due to poor carving" (Summary of discussion Focus Group Garki District 1. The interview was conducted on 18th July 2021).

The consistent factor here is that FW occurs via different routes, and stakeholders are aware of the majority of these. The majority opinion among the focus group participants is that FW is traceable to the activities in the kitchen, with few opinions stating otherwise. Staff practices are key to the generation of this waste, and its management should be achievable by behavioural change. Participants in the discussion also highlighted the way in which waste results from their individual handling of food. Diverse opinions surfaced, as the responses were designed to be particular to individuals. Although there are areas of convergence, many diverse views also emerged, such as a lack of skills, infrastructure deficiency in the industry, and poor use of resources.

The discussion narrowed down waste generation by specific firms. Interviewees had no different opinions to those they had expressed earlier as the causes of food waste. However, they provided some descriptions of how FW is generated within their individual firms, with employees expressing reservations about the attitudes of their management:

> "Management has seen no reason to take our advice on FW within our firm, even though we have mentioned some of its causes to them". (Summary of discussion Focus Group Garki District 2. The interview was conducted on 24th July 2021).

> "We have had a series of management meetings but there has been no implementation". (Summary of discussion Focus Group Garki District 1. The interview was conducted on 18th July 2021).

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Others believe that the attitude of their management towards FW is not sufficiently responsive to address the challenges:

> "We are doing all we can to help manage the generation of FW because we earn our living here". (Restaurant manager in Focus Group Garki District 2).

Table 5.3: Summary of the main causes of FW in Garki districts

No.	Causes	Stakeholders' illustrative comments
1	Communication amongst stakeholders	"We need to communicate so we can share information; lack of communication influences kitchen and plate waste". (Resident of a local community, female, aged 41).
2	Management practice	"The truth is our management have what it takes to manage food services; they have the manpower and skills, but they need to be innovative in their reasoning and decision making".
3	Lack of re-use of surplus food	"The chef's unwillingness to re-use surplus food or spare ingredients leads to waste".
4	Professional cooking skills	The problems are that most of my colleagues do not think that they need to be trained in food handling; it is shocking when you see the waste which results from their negligence, but they would still argue with you".
5	Competitors	"We have a variety of options where we can get a good meal if our regular providers begin to compromise on their standards. "You know say I no go dey pay for food wei me no enjoy…."
6	Diners' values and attitudes	"We have recorded waste many time, especially that which was left by customers, these surplus food are not usually fruit, but drinks and actual food" (School supplier, male, aged 42).
7	Use of integrated technology	"The use of technology has helped to improve our services and reduce waste. The lack of it leads to waste generation".

8	Food handling skills	"We know that knowledge and skill development is important for a better service; hopefully our management will provide us with a platform for this".
9	Inappropriate demand management	"We sometimes purchase goods which are not needed simply because this is part of stock taking; this often means that we over-purchase".

Source: Author's own

From the perceptions of the food service actors and the responses that have been provided, several factors are responsible for the generation of FW in the various food services identified and the data obtained from them. For example overproduction, large portion size, storage inefficiency, and a lack of skills are some of the reasons cited as the causes of food waste. Clearly the major causes of FW vary from firm to firm and the nature of food service outlets; FW is greater with local vendors and at the stage of vegetable preparation prior to cooking. This is due to a lack of cooking skills and resources for cooking and slicing vegetables such as tomatoes, spinach, onions, and paper.

The other issue with local vendors is the environment and the nature of their services, which have inadequate hygiene, meaning that customers leave a significant proportion of their food uneaten. Finally, the storage facilities of local vendors are entirely inappropriate for the storage of pre-cooked food, therefore this cannot be preserved for a longer period of time. This is different to the case of restaurants and cafeterias, which in this study provided a similar response. FW in this context is caused by oversized portions of meals and guests purchasing meals that they are unable to consume.

Figure 5.1: Pre-kitchen FW poorly displayed for sale

Source: How waste, roadside display in food marketplaces pose dangers to Lagosians (the Guardian Nigeria, 2021

When discussing the causes of FW, because FW is unacceptable most interviewees (26 of 32, apart from the outliers, which are firms 5, 10, 13, 23, 31, and 16) cited the cooking skills of the chef and the kitchen staff's behaviour within the kitchen as major causes of FW; this is the stage at which most of the food handling takes place.

> "A chef's unwillingness to re-use surplus food or spare ingredients leads to waste". (School catering supplier, female, aged 40, Garki District 1).

> "FW is caused by overproduction" (food suppliers, females), "a lack of communication, and poor coordination" (resident of a local community, female,

aged 41), "lack of use of technology" (manager in a privately-owned canteen, female, aged 49), and mode of transport of certain fresh products (school supplier, male, aged 42), hospital canteen manager (male, aged 34), and cafeteria chef (male, aged 51).

All 32 interviewees highlighted the fact that additional causes of FW are large portion size, errors in serving meals where they are prepared and served to the wrong customers, and large portion size. Participants cite further examples of inappropriately forecast demand; a catering service customer in her mid-40s has this to say:

> "Sometimes the type of environment in which food is prepared leads to a decision not to eat it, even if it has been paid for. Once, health was more important than the cost of the food, so I just left the food and departed in this situation".

Here, the customer places priority on their health, rather than the purchase cost of food. Only one interviewee cited the environment as one of the causes of FW because it is not fit for food preparation and cooking. Most participants believe that FW results from customers' attitudes and behaviours, particularly in over-ordering food. A female local food vendor customer aged 41says:

> "Some come in with friends and place orders on their behalf with no consultation with their guests; guests end up eating little of the food served and the remainder is thrown away". (Hotel kitchen manager, aged 68).

> "Most customers don't take our advice; even if we suggest they order their meal in courses, they insist and ask for it to be served as requested. At the end of it,

they cannot finish their meal". (Hospital canteen service, manager, male, aged 34).

Table 5.4: Showing general perception of food waste.

Perceptions of FW	Stakeholders' illustrative quotations
Participants described FW as food originally prepared for human consumption which ultimately becomes unfit for human consumption. Several interviewees (13, 16, 18, and 24) expanded the description to include: "allocated to other purposes, such as animal feed and disposal".	"FW is produced daily within the sector; all stakeholders see how it has developed. It seems scary to them that food meant for customers ends up being thrown away and fed to animals. This is a loss regardless of the fact that it was not originally destined for animals. Despite this, most of it is thrown away".

Source: Author's own

Figure 5.2 Large quantity of food left for sale at the close of the trading day

Source: Author's own

Regardless of the nature of their services, participants linked an understanding of FW to the activities which occur within the sector in terms of handling at all stages of the supply chain. These food waste causes are discussed in more detail in the following section.

5.3.1 Communication between stakeholders

The findings revealed that many of the food service actors fail to understand the role of communication in the management of the food sector. Some participants who are company staff believed that owners and managers do not see them as having an impact on the management of the business. Kaipia et al. (2013) contend that enhancing communication across organisations in food services can significantly cut costs and decrease waste throughout the chain. The participants of this study concurred that communication between chain members was completely absent:

> "We need to communicate so we can share information; the lack of it influences kitchen and plate waste". (Resident of a local community, female, aged 41)

> "The most worrying part is that the Government not shown leadership by providing or initiating a communication line and as a policy for the sector's players". (college canteen chef age 50)

The role of management in the reduction of waste requires the development of a communicative culture which helps to decrease uncertainty and renders it easier to respond effectively to interruptions along the supply chain. In particular, food service waste amounts in the kitchen, buffet, and plate stages, are influenced by communication. External stakeholders such as hotels, restaurants, and caterers (HORECA) have shown little interest in FW management. As key external stakeholders, they have a role to play in providing the necessary support to share information. It is clear that, in Garki, customers have expressed dissatisfaction

over time simply because they were unable to obtain the information required to make a decision on what and when to buy a specific resource, and the post kitchen staff who serve the item will simply state that they do not have the information.

The findings suggest that greater communication might reduce the development of kitchen waste when complaints about poor-quality items are made, when kitchen staff react to a poor-tasting meal, or when an order is placed in error. Reaching an agreement on appropriate portion sizes, which affect plate waste, necessitates dialogue between the client and kitchen workers or providers, such as the chef in the kitchen communicating with waiting staff who have more direct contact with the customers.

5.3.2 Management practice

The viewpoints of the participants indicate that food service management practices influence kitchen waste, serving loss, and plate surplus food. The management system influences, for example, the way in which kitchen activities are monitored and regulated, and numerous practical considerations such as retaining and adapting recipes, determining the amount of food to be prepared, menu planning, and inventory management. The majority of Garki kitchen staff believed that company management had not been able to introduce sustainable practices:

> "Can you imagine a system where you hardly ever see a strategic plan made by the service managers on the firm's sustainability? I have managed a firm before, and I have always believed that I should speak and show leadership by integrating and networking with others internal and external to the business". (Catering service customers female 45).

The study's findings revealed that private stakeholders are more determined to provide suggestions for better management practices in the food sector. For example, one faith-based

organization (FBO) in Garki, owned by an orthodox religious body, organises a workshop on how the hungry should be helped; this includes advice on various practices which potentially help to save food and re-distribute it to others:

> "I think the way some of our colleagues manage their various firms has led to the outcome of the kind of waste we have witnessed.. and I can tell you that the lack of communication and staff training, which was caused by the managers, has been a challenge to our sector". (Restaurant manager, female, aged 40).

One of the practices which challenges the sector is a lack of effective communication amongst actors, poorly proportioned and oversized portions which increase kitchen waste, and buffet waste in the form of recipe errors and overproduction of food, both of which both increase waste levels. The majority of managers and owners agree that providing instructions on food preparation and delivery requires staff to be both trained and skilled. A food management system helps to govern a firm in terms of monitoring, documentation, and control. An effective management system influences the quantity of FW produced by coordinating and planning specific actions.

Figure 5.3: Food service open space
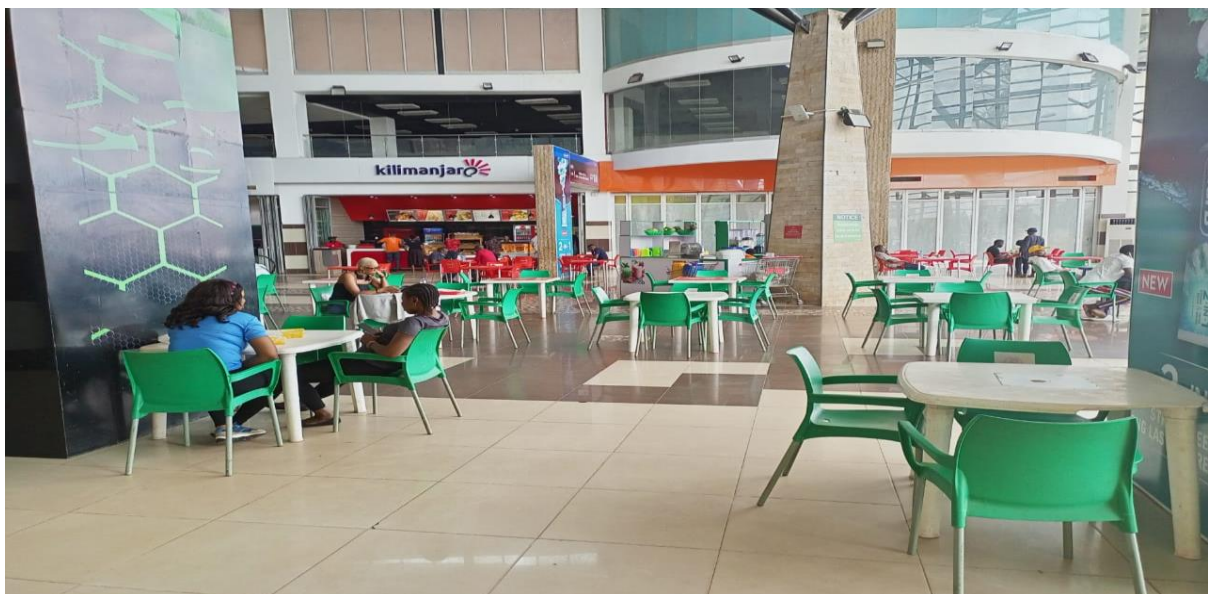
Source: Author's own

> "Ensuring that the right thing is done inside and outside the kitchen area requires leadership to direct and control the use of resources, with the necessary skills being provided for everyone involved". (Local resident, female, aged 41)

In the food service industry, management entails overseeing people, activities, and processes; managers can affect the amount of FW produced in the industry by using these tools. Managerial work is linked to other elements which influence food waste such as professional skills (competence) and management systems. The way in which managers carry out their responsibilities exerts a direct impact on the amount of waste generated in the kitchen and from buffets. A manager should be able to motivate, encourage, and instruct employees to enable them to carry out their jobs professionally and to their full potential. In terms of waste management, it is essential to have trained individuals working on jobs which are appropriate for them.

5.3.3 Lack of re-use of surplus food

Reusing surplus food is regarded as one of the most effective measures against FW (Secondi et al., 2015). Individuals who make use of surplus food create lower levels of FW (Stancu et al., 2016; Stefan et al., 2013). In Garki, the stakeholders interviewed did not routinely re-use their surplus food, simply because it would have been spoiled at the time when it was ready for re-use:

> "We suffer a lack of power supply to maintain our refrigerators; if you look on the street corner you will see two fridges and a freezer - all of them worked until a week ago when the electric power supply failed, and I do not have the capacity to use a generator simply because of the cost of running one. So we should now

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reuse some of these items, attempting to reuse them and the problem of food going bad; if not, customers will simply throw it away, increasing FW". (Local vendor, female, aged 41).

Figure 5.4: Spoilt food as leftovers

Source: Tourism Review news: food waste: should the tourism industry worry? January 13th, 2020

The general lack of infrastructure is earlier mentioned by Papargyropoulou et al. (2014); they suggest that the problem in developing countries is that a lack of infrastructure causes waste. However, in this case, inefficient power supply renders it impossible to keep ingredients and other perishables safe for later use. Some stakeholders explained that, when it was time to use saved ingredients, they would discover that they were spoilt:

"We have suffered so much loss due to the nature of the climate, inadequate resources, and lack of legislation here in Garki and the north; just imagine that the weather is now 29 °C to 32 °C. You cannot store any cooked food without

using refrigeration, but why do the lack of light and power cripple so many economies? Even in my home I do not allow for food or perishables to be wasted due to ineffective power supplies".

Garki, located in the northern part of Nigeria, has an average temperature of 31 °C with precipitation of 20% and humidity of 65%. During the phases of preparation and service (or consumption), a large amount of FW is generated (Risku-Norja et al., 2010; Papargyropoulou et al., 2016). The re-use of surplus food helps by saving time, labour, and money (Cappellini, 2009; Waitt & Phillips, 2016), although this is difficult to achieve in Garki.

5.3.4 Professional cooking skills

It is a disturbing finding that the majority of the participants say that they do not pre-training to understand cooking, explaining that they cook in their private homes. These participants do not consider the quantity of food, the costs, and the preparation involved in commercial or large-quantity cooking. Heikkilä et al. (2016) define 'professional skills' as referring to an individual's capacity to master their responsibilities and respond appropriately in a variety of scenarios. It is more likely that an untrained staff member will commit cooking errors, which may result in food being disposed of. A female restaurant manager, aged 44, explains that she has been cooking since she was a young girl:

> "Cooking is a profession; therefore it requires skills; I know that most of my colleagues do not have a training certificate to justify their roles in the sector, but the idea of cooking at home and here is not the same because the nature of the people who patronise us here is different to family members".

The evidence in the scale of food thrown away and littering of the environment by the majority of the food services results from a lack of cooking skills. These statements demonstrate the reasons for waste and should therefore receive attention.

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"Cooking for large numbers of people requires skills and experience. Speaking for myself as a customer, I am a graduate of public administration and with a well-paid job, why would I want to spend money for food which is not well- or hygienically-prepared? The skills of chefs and other staff are important for better services". (Catering service customer, female, aged 34).

A lack of skills on the part of food service stakeholders such as managers and kitchen might lead to various errors, such as wrongly reading or interpreting a recipe. Professional cooking skills require attention to detail, meticulousness, and the ability to follow instructions. Food kitchen workers and other supporting staff need to be trained in management of the cooking process. This is further evidence of the fact that external stakeholders such as researchers and academia, the Abuja Chamber of Commerce and Industry, and non-governmental organisations (NGOs), have inadequately carried out their supporting role.

5.3.5 Competitors

As mentioned earlier in Section 1.3.2 and Tables 1.1 and 1.2, Garki's FS sector has numerous providers, although there are no accurate statistics currently available. However, an estimate would be that some 800 food services provide fast-food, take-away services, and restaurants. Each individual sector player develops their own survival strategy, hence different kinds of dishes, whether they are local or international in nature. The level and nature of competition which exists produces surplus FW simply because some players have more capacity to drive patronage than others:

"Ha! Can you see how customers come into my shop compared to the others? All our food is fresh and local, and is served in a modern, air-conditioned environment for our customers' relaxation. How many of them around here can turn on air conditioning for ten hours for staff and customers who come in can

sit comfortably, eat, and watch television. I have invested and I am truly enjoying the patronage". (Restaurant owner, male, aged 72)

FW occurs when other service providers' food is not purchased or consumed, resulting in its disposal. For example, the substance and appeal of a competitor's daily changing menus which offer a range of options renders forecasting of the required amount of food for a buffet more challenging. Experience gained from the entire food service delivery process, such as preparing food in a timely and appealing way, provides a competitive advantage:

"We are not a big business, although we have good customers, but we still need to satisfy them as others who have the resources do. We have big players in the market who likewise order delivery to offices and their homes as part of their packages, but for those of us who cannot do all of that, we maintain our small customer base". (Catering service driver, female, aged 54).

Below is the original transcript made during interview, which was translated by the author to provide a better understanding:

"Who sabi mi? habi which big company go ask me to bring food, you know say big people they dio wit big people, we they thank our God say we get better customer wey dey buy from us. For me na here I dey and providing for my small, small customer using my tricycle".

Competition is growing within the food service industry, with firms making an effort to take advantage of the challenges others are likely to face. Food services which fail to provide a standardised food service experience will lose customers, and FW will result.

5.3.6 Lack of use of integrated technology

The use of integrated technology (IT) in supply chain management for efficiency has been fully discussed in the body of literature. A lack of IT impacts the performance of the FS sector in terms of effective food service delivery; this includes payment systems, communication, and resource distribution. In Garki, participants believed that the technology being used was not integrated in nature, leading to a lack of accountability for the inventory. Additionally, there is no technological application for the management of food service or FW in payment systems. One of the major sources of FW in Garki is food storage; waste consists of spoilt or forgotten food which will go to waste as it becomes rotten:

> "Hardly any businesses are innovative without technology; why can't we provide a platform for our customers can order their meals, rather than allowing them to all come in here, crowd the place, and place staff under pressure? Look at the western world where all orders can be placed online, and in the other retail businesses IT helps to show what has and has not been used". (Academic/ researcher at a public university, male, aged 46)

When food is wasted and/or disposed of, creating an environmental challenge, the Abuja Environmental Protection Board (AEPB) and the Federal Environmental Protection Agency should identify the organisations which generate it and provide support in order to minimise it. IT provides a more standardised transaction system process among the various levels of service, with stakeholders' involvement. These systems provide essential data for sound decision-making. Jedermann et al. (2014) argue that an automated demand forecasting system based on enhanced information flow between the parties involved in service delivery can significantly minimise food waste. Integrated technology helps firms to respond quickly,

adjusting to supply and demand when necessary. This study illustrated the fact that technology has a place in food service delivery:

> "We seal food in a bag using current kitchen technology such as a 'sous vide', which has been proven to decrease food waste. When fresh raw materials such as meat and fish arrive, they are promptly processed and the necessary bones are removed, then they are packed in vacuum-sealed bags, encouraging longer food storage. Since we began using this technology, fish and meat waste have decreased by nearly 40%. It is also of high quality; therefore, we have no complaints from consumers about the freshness of our meals". (Private restaurant management operating in cooperation).

The use of technology has worked in other supply and distribution domains and in the food services of developed countries. There is, however, a significant gap in its application in the Garki district area and in Nigeria in general. The use of other technologies have produced strongly positive results in other services such as health, transport, and aviation; it appears that Nigeria's food service is where this integrated technology needs to grow.

5.3.7 Diners' values and attitudes

The study revealed that, in addition to the issue of food taste, the appearance and nature of food is associated with the generation of FW. Diners expect food to appear attractive, increasing their willingness to eat. However, if food does not appear sufficiently attractive, it will be ignored, and waste will occur. The nature of Garki consumers, who are described as 'sophisticated' and 'high income earners', means that they expect to be served in a professional way, with high expectations of staff.

"Customers nowadays leave food on their plates for various reasons; it can be because they are unhappy with the food type and taste, and sometimes due to the staff's attitudes". (Catering service, customer in a privately held, age 34)

A hospital canteen manager, male, aged 34, and a customer who has been patronising a restaurant for over five years say:

"I know what I want and I am clear on my expectations whenever I go out to eat. Why should I spend my own money on food which is unfit? I am prepared to pay for food and services, but I need to be satisfied. I do not eat cold food and I always make this clear on arrival".

These expectations contribute to the amount of FW created, especially when needs are not met. The waste recorded in Figure 5.7 was leftovers after a family's graduation celebration for the father. The family, including the mother, chatted, drank, and took photos while the food became cold, and they could not enjoy eating it again. The mood of the day made them full, although they had ordered a large quantity.

Figure 5.5: Food waste due to leftovers in a private restaurant after a university graduation outing with family

Source: Author's own

Specifically, regarding plate- and buffet waste, in Garki and other parts of Nigeria it was discovered that low appreciation of food, such as in the case of the government free feeding programme at primary school level and serving too much food on a plate (oversized food dishes) increases the amount of food wasted.

5.3.8 Handling skills

Stakeholders' views indicate that customers are only prepared to purchase food which is, in their opinion, safe and hygienic. As mentioned in Section 5.6.6, Garki food customers are sophisticated and scrutinise their food critically. The nature of manual handling in Garki foodservice is likely to lead to a deterioration in food hygiene and food quality (Viswanadham, 2007). Store managers believe that the majority of damage to fruit, vegetables, and meat leading to food wastage resulted from inappropriate manual loading and unloading from the

trucks, with damage also occurring during the three operational stages of food services i.e., pre-kitchen, kitchen and post-kitchen.

All interviewees shared their views on FW generation due to food handling at the three operational levels of pre-kitchen, kitchen, and post-kitchen, with participants identifying practices which have created FW due to handling. A variety of opinions were advanced, such as:

"This is usually when kitchen staff and waiters wrongly allocate portions and ingredients, either as over-allocations or disposals, or when receiving orders from our suppliers; they arrive poorly bagged and not properly inspected before delivery to the store". (Catering service school supplier, female, aged 40 years)

How waste occurs is differently perceived by each interviewee, as their responses appear to be influenced by the type of food service they are associated with and how food management is practised. Other participants' views include:

"In the kitchen we make poor use of human and physical resources, with staff struggling to meet demand, especially where they are not properly trained before being allocated demanding responsibilities". (Restaurant manager, female, aged 40).

Interviewee 17 says:

"The challenge in the open dining space where customers eat is that staff sometimes mistakenly throw away food meant for customers when serving them, or they take food to serve them on their allocated table, and it has to be

replaced. This usually results from a lack of concentration and poor dressing".
(Local community resident, female, aged 41).

"In my opinion, as an owner, most of the waste which occurs here results from
poor handling of food and materials by kitchen staff, and the attitudes of
waiters". (Local food vendor, male, aged 41).

Most participants also believed that serving mistakes are another issue with food handling when
an order served is different to the menu advertised. The lack of infrastructure and the inability
of external stakeholders such as governmental, research, and private financial bodies to
intervene by providing funding to procure the resources for innovative management has led to
further waste resulting from manual handling. Furthermore, a lack of training and professional
skills is also linked to poor handling at all stages of food service. Where there is a lack of
understanding of modern material handling practices, this contributes to ineffective practices
(Joshi et al., 2009), resulting in massive food waste.

5.3.9 Inappropriate forecast of demand

The challenges of ineffective forecasting contribute to FW due to unused raw materials which
are past their expiration date; this problem usually occurs at the pre-kitchen stage of food
service. Not all the actors in Garki FS are able to forecast demand due to the unavailability of
accurate data from the store to the kitchen. A caterer who supplies food to schools expressed
female frustration by saying:

"The prices we see for a particular item today will change in the following
market days, thus formulating a proper plan is difficult for ingredients and fresh
produce as these are also affected by weather conditions, supply and demand of
particular varieties, periods of availability, and transport facilities".

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Daily arrivals of fresh produce to a particular wholesale market also have a direct bearing on prices (Hegde & Madhuri, 2013).

> "We have had a hard time procuring fresh tomatoes and palm oil from the east due to the communal crisis and unrest in the region. Therefore, when we make projections, it is often unrealistic to expect goods when we need them, although they end up arriving when we have already obtained alternatives, so we are overstocked".

Intermediaries often delay shipments, expecting better prices in the near future, which leads to food wastage due to deterioration of food quality. "I recently had to let some of my employees go because they didn't know how to handle inventory well". (School supplier, catering services, female, aged 40).

> "As a result of the lack of skills to understand when the need for storage demand arises, kitchen staff are left with inadequate resources to meet the needs of our customers". (Kitchen manager in a hotel restaurant, male, aged 68).

5.4 Linkages between factors

The nine elements described above constitute a model of the interrelationships (Figure 5.6) between the factors influencing FW in the FS sector (Table 5.3). According to this analysis, three of the factors exert a direct effect on food waste: professional cooking skills, food handling skills, and diners' values and attitudes, whereas all seven other factors, specifically: communication amongst stakeholders, re-use of surplus food, inappropriate menu planning, competitors, use of technology, management practices, and ineffective demand management influence the situation indirectly via one or more elements.

The model illustrates the links between the factors which lead to the generation of food waste. Some of the elements are interconnected to the majority, such as communication which directly influences the outcome of all elements within the sector. This includes the way in which stakeholders respond to the management of kitchen activities; communication among stakeholders could reduce the occurrence of FW where attention is paid to closing the gap.

Some kitchen staff explained that they refuse to re-use surplus food, for reasons of professional practice and/or hygiene concerns. Apart from spoilage due to poor storage facilities, this is generally based on personal perceptions of using long-stored and out-of-date ingredients. Although some participants raised concerns about the poor storage of surplus food, they were unwilling to use it. In the case of pre-cooked meals or sauces, it is believed that they do change the taste of a meal due to inappropriate preservation of the various ingredients' combinations. Arguably, unutilized surplus food spoilage constitutes wasted food.

When menus are not appropriately planned, the wasting of food is unavoidable. Menu planning requires that food service stakeholders know and understand what should be prepared for which group of customers and in what quantities, which is a skilful and professional demand for the stakeholders involved. The idea of 'the less you buy, the less you waste' is relevant to the food service, because stocking food for a longer period of time may be another route for FW in view of the challenges associated with food storage systems.

A well-planned food service and delivery system is an indication of effective demand management; food service management practices are predicated on the premise of effective communication among all actors. The importance of communication in the food service industry cannot be overstated. A food service company's insufficient internal communication also affects its consumers; continuous contact and involvement with consumers are necessary

to ensure client satisfaction. There should be excellent communication between a firm and its customers, as well as between different organisational levels within the company.

Chefs' cooking skills also influence diners' values and attitudes in the sense that a good meal generates a specific response from the customers, usually a positive one, which helps to increase patronage and retain customers. Without an innovative skill applied to the preparation and serving of meals, there is a likelihood of food wastage. Customers' wish to eat food leads them to pay a certain amount to satisfy their hunger or taste; when they are disappointed, waste is likely to occur as food will be thrown away. The industry is complex because it serves people who have a choice, and there are multiple competing food vendors ready to take their business, which is a cause of FW for other vendors who are unable to compete successfully. Based on information on their knowledge of cooking, customers can leave a particular vendor and patronise others. There is also a need to track and facilitate services using integrated technology, which supports service delivery.

A management system which is a tool for supporting an organisation's daily operations but does not recognise the social aspects of management and professional skills is likely to fail (Heikkilä et al., 2016). Systems are used to regulate recipes and portion proportions, setting standards for tasks such as waste documentation. By leading staff and upgrading and enhancing management systems, managers influence employees' professional capabilities. In addition, the professional abilities of an entire team play a significant role and should be supported by a manager's efforts.

As well as to the professional abilities of culinary staff, customers' beliefs and attitudes exert a direct impact on food waste. In Garki and other parts of Nigeria, it was identified that, due to low appreciation of food such as the case of the government providing a free feeding programme at primary school level, food was left uneaten due to its quality and taste. This was

a result of tastes and attitudes towards the free food programme. The entire set of factors here is directly related to management practices as a major stakeholder with the authority to plan, direct, and control human and physical resources. Management practices of this kind support the appropriate forecasting of demand, which is linked to training and skills developed over time in the firm, either on the job or from a training centre, which support and govern food handling and management.

Figure 5.6. Schematic model of the linkage between factor influences FW in Garki, Abuja
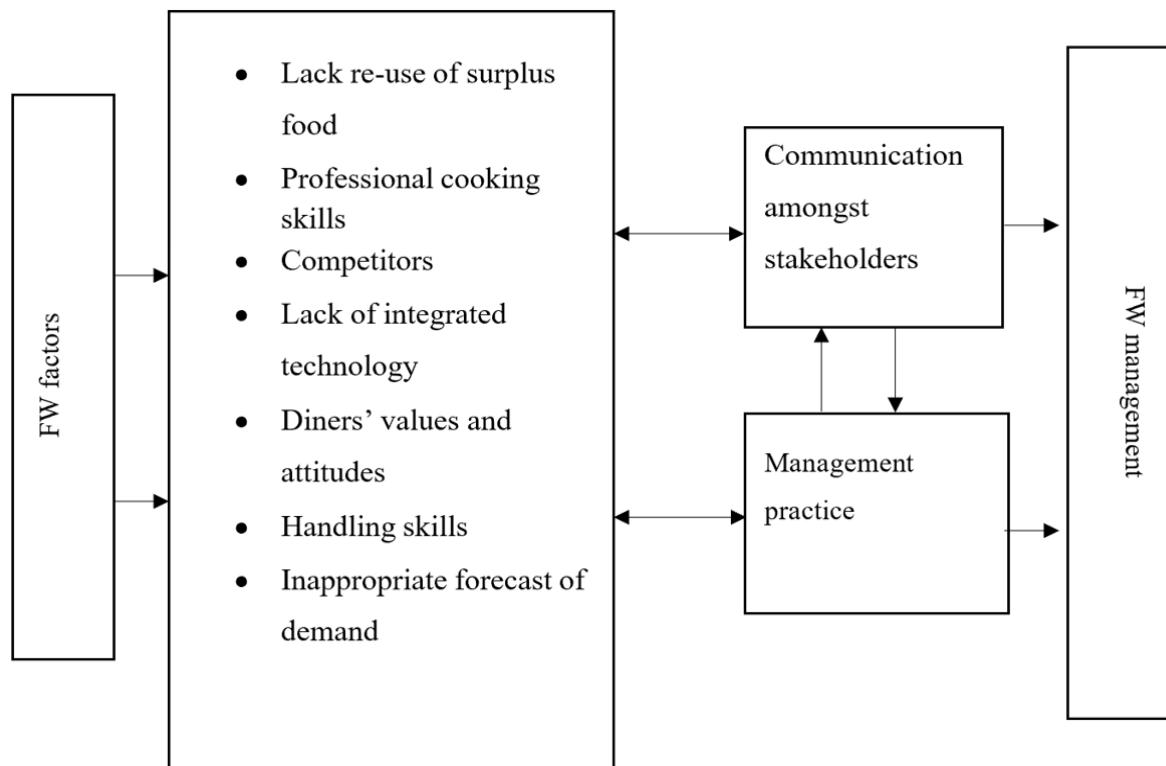
Source: Author's own

5.5 Major waste hotspots

During the discussion, interviewees were asked about their views on major waste hotspots. The findings revealed that the most significant waste hotspots in the foodservice sector were

cooking ingredients, meat during carving, vegetables, oils and fats, and nutrient loss due to poor storage. A chef or caterer makes use of a variety of ingredients at different stages of the cooking process such as salt, pepper, olive oil, vegetable oil, all-purpose flour, and granulated sugar. Other hotspots include the peeling of packages, scrunching, and allocation of ingredients. In some cases, the view is that these are either over- or under-allocated, resulting in poor flavour. This happens if the ingredient is not appropriately allocated in the correct quantity.

> "The chef's attention should be on the ingredients, as these are often wrongly allocated and result in FW due to the poor flavour they create". (Canteen worker, male, aged 48).

Interestingly, only two interviewees (a hospital canteen manager, female, aged 45, and a hospital canteen manager, male, aged 44) regard fruit as a hotspot for food waste. Conversation was more focused on vegetables as the food items which make the highest contribution to waste. Regardless of their districts of origin and the type of service they rendered, vegetables were cited as hotspots.

5.6 Food waste levels and the role of agencies

This section sheds light on various aspects of FW and the way in which they relate to this research study. Waste can occur at all stages such as firm level, both upstream and downstream of the supply chain. The result of this waste is what is seen at disposal when food is no longer edible because it has been classified as FW (Chapter 1, Table 2.2); there are therefore governmental agencies and private initiatives which have consistently helped to protect both organisations and the environment. These are the agencies which are also responsible for waste collection within Garki districts; their mandate is specifically to protect the environment and natural resources such as land and natural habitats. Finally, a small number of non-

governmental organisations (NGOs), such as faith-based organizations, also play a role in seeking to educate consumer and food outlets on the need to take caution in terms of FW management.

This study has investigated FW at firm level, presenting its findings in which participants have discussed the major causes of FW in their respective services. Participants were of the view that, to a large extent, a lack of skills in food handling and storage facilities are major drivers of FW due to poor infrastructure to preserve food (refrigeration and space), which results in loss of flavour. Some believe that unhealthy attitudes of staff towards one another result in poor communication and negative behaviours towards customers; this can take the form of waiters deciding to ignore customers when raising a complaint, leaving them dissatisfied.

5.6.1 The role of agencies

Governmental efforts comprise commercial, non-governmental, and public sector players. Initiatives such as 'Food Smart Nigeria' aim to develop an efficient food system which satisfies the country's food requirements and is ecologically sustainable; Nigeria has pledged to eliminate food loss and waste at both international and national levels. In reality a number of international organisations, including the African Development Bank (ADB), the United Nations Development Organization (UNIDO), and the World Food Programme (WFP), are engaged in the global reduction of FW, in which Nigeria actively participates by demonstrating its commitment to the UN's Sustainable Development Goals. The goal is to halve per capita global FW along the supply chain and to meet the country's nationally determined contribution under the Paris Climate Agreement through mitigating policy actions, transitioning towards climate-smart agriculture as part of the UN's Vision 2020, as well as regionally through the Malabo Declaration, in order to halve post-harvest losses by 2025.

The Food Loss in Nigeria Report 2021 from the Ministry of Foreign Affairs is an important step towards the minimisation of FW on a national scale. The Federal Ministry of the Environment, in close coordination with the United Nations Industrial Creation Organization (UNIDO), coordinates with the Federal Ministry of Agriculture on the development of the National Policy on Solid Waste Management (FMARD). Other related projects include the Toward Sustainable Agribusiness Clusters via Learning in Entrepreneurship (2SCALE) project, which is supported by DGIS-Netherlands and is collaboratively undertaken by IFDC, the BOP Innovation Center, and SNV.

5.6.2 Food waste collection and disposal in the Garki districts

Some Nigerian cities are listed as the most polluted and least habitable in the world due to poor management of solid waste. The country's population increase has not been matched by appropriate finance and infrastructure facilities to effectively address the ever-increasing volume of refuse, which now totals some 42 million tonnes per year, of which 52% is food waste. State governments collaborate with private businesses in the nation's states to collect refuse, but in Garki, the federal capital territory (FCT)'s environmental management agency is responsible for waste collection and disposal.

Figure 5.7 waste collection In Garki Districts Abuja

Source: Waste-management board tasks residents on environmental responsibility (Eloka, 2022)

Approximately 50% of refuse is disposed of using formal waste containers, while the remainder is dumped on open land. The production of strong methane emissions by FW poses a substantial danger to Nigeria's capacity to achieve its climate obligations. By 2050, 70% of the population, representing 280 million Nigerians, are expected to be resident in metropolitan settings. If a comprehensive solid waste plan is not adopted, Nigeria's landfills will become increasingly overwhelmed with hazardous emissions increasing as incomes rise and diets adapt to include a higher number of perishables and proteins.

In addition to infrastructure and planning, local governments in Nigeria struggle with enforcement, consumer knowledge, and capability. Growing consumer awareness of food waste, increased access to home refrigerators, and enhanced packaging, labelling, and

standards will all contribute to a decrease in the amount of FW entering Nigeria's landfills. Nigeria has the potential to convert collected FW from cities into biogas thus reducing negative environmental impacts, although this requires a coordinated effort on the parts of cities, consumers, and businesses.

The focus of this study is not on the disposal of FW, but rather on its causes and mitigating approaches from multiple stakeholders' perspectives. However, governmental agencies and non-governmental organisations (NGOs) play an important role in policy development and raising awareness of the need to address FW generation, proposing mitigation strategies, so that stakeholders' perspectives on these are included.

The Abuja Environmental Protection Board (AEPB) and the Federal Environmental Protection Agency have always insisted that food waste should be separated for proper disposal; this should be contained in a strong polythene bag which avoid spilling in food preparation and consumption areas. In recent years, Garki's waste disposal services have focused only on solid waste such as bottles, cans, and other non-food waste which blocks drainage, causing water to escape from the drainage system. The agencies now also concentrate on food service waste as this is becoming the major source of environmental pollution after CO_2; it emanates from vehicle and generator use to power facilities such as fridges, fans, and lights.

The findings show that there is an integrated approach to the reduction of FW's environmental impact from the government agency perspective by collaborating with other stakeholders in this regard. The government occasionally calls for synergy, reminding the main actors of their roles in keeping the environment clean. This includes the regular last Saturday of each month, which has been slated for environmental sanitation.

5.6.3 The role of non-governmental organizations (NGOs)

Globally, the desire for increased food consumption is indisputable, mostly owing to the annual increase in population. In addition, other persistent concerns, feeding Africa's growing population is one of the continent's greatest challenges, notably in Nigeria. As a result hunger, malnutrition, and food insecurity are widespread across the continent despite governmental agriculture intervention and food industry support. Without equivocation, food insecurity is likely to intensify if population growth continues without a proportionate response to halt the situation.

Within the study context of this research, the role of NGOs or any other charitable organisation is absent; there are few charity initiatives in the country with a meaningful impact which support the community by reducing FW through the provision of food support and campaigns to decrease waste. One example is the Lagos food bank initiative, which has a massive reach; some research respondents were aware of Lagosian NGOs. A private initiative in Abuja invented an app named 'Chowberry'; this links people to supermarket food which would normally be disposed of. There are significant differences between the roles and presences of charitable organisations and other private initiatives.

Nigeria annually loses and wastes a significant proportion of its total food production, which is never redistributed despite the country's levels of hunger and malnutrition. One of the main reasons for this is that, despite policy formulation by the government and business, voluntary organisations which should supplement the government are not visible, while NGOs' presence is similarly lacking. FW is undeniably common and frequent in Nigeria downstream of the food supply chain. For too long, public and private organisations have ignored the issue of food waste; the recent COVID-19 pandemic and farming leaders' clashes in the country have further widened the hunger gap. There is now a steady increase in hunger due to security concerns, the

movement of goods, allowing animals graze in the open, pressure on the environment, a lack of new ideas, and climate change. Although FW is a global problem, it appears to be more prevalent in Nigeria in the face of these the current realities. Therefore, persistent FW amid starvation should not be ignored.

5.7 Summary

This section provides evidence of respondents' perceptions noted in the interviews and focus group discussions on FW and its causes. Overall, participants have their individual understandings of food waste, and these do not conflict with the general and scholarly understandings of the term 'food waste'. FW generation is not acceptable to the interviewees because they are aware of its implications and origins, ranging from customers' ordering of surplus food, poor handling of food within the kitchen and outside, overproduction, and surplus food as some causal factors. FW hotspots are generally in the kitchen during processing, such as carving meat and vegetables, and customers' attitudes towards leaving food on their plates. According to the interviewees, the major causes of this FW are the handling practices of kitchen staff and the poor use of resources.

Chapter 6 Issues with food waste management and emerging opportunities

"Wasting food is like stealing from the poor", Pope Francis

This study set out to understand stakeholders' practices in the management of FW and future opportunities which may be provided for the FS sector of the supply chain, in particular in Garki, through the lens of practice theory and Freeman's stakeholders' theory. Findings from 32 employees' interviews and the focus groups from the two Garki districts have shaped the author's understanding of how staff perceive the issues with FW management, its impact, the challenges it poses to the sector, and how it affects organisational stakeholders. Four categories represent the process of understanding the impact and challenges of FW in the food service sector; these are: the consequences of wasted food, the stakeholders affected by the consequences of FW, the challenges faced by organisations in reducing food waste, and the approaches to mitigate these challenges for individual firms or multiple-stakeholder collaborations.

All 32 interviewees responded to questions about the impact and challenges of FW in their various organisations; the participants' perspectives on each of these four areas were consistent. Three respondents of 32 (2, 15, and 26) had a more limited understanding of the effects and challenges of FW in a corporate setting. However, the overall discussion in this chapter is focused on the four-category model, with an extended exploration of emerging opportunities. The following section describes the relevance of the four categories and the role of the firms' external and internal stakeholders' practices in the management of the sector, and how these practices enhance the sector's future expansion and address the United Nations' millennium development goals (MDG) of halving FW by 2030.

6.1 Impact of food waste

Interviewees from 32 respondents showed common agreement on the consequences of food waste. Table 5 illustrates the category of 'consequences of wasted food', constituting a list of sub-categories, which, in the opinions of the interviewees, are the consequences of food waste. Consistency among the responses is presented below.

Table 6.1 Composition of the consequences of wasted food

S/NO	The consequences of wasted food: subcategories	Sources
1	Loss of economic resources and income	32
2	Environmental impact	32
3	Destruction of resources	32
4	Nutritional safety	32
5	Social impacts	32

Source: Author's own

They concur that loss of economic resources and income, environmental impact, destruction of resources, nutritional safety, and social impacts are all the effects of FW on human society. This is consistent with previous research on food waste (Thyberg & Tonjes, 2016; Papargyropoulou et al., 2019; Dhir et al., 2020; Gao, 2021). The interviewees' responses are grouped into three parts, specifically: economic, environmental, and social, as defined in Chapter Two of this research study. It is clear that issues of food waste, hunger, loss of good health, and revenue are interlinked.

A school food supplier said:

"I have continued to mention the negative impact of FW on the execution of our responsibilities, because as a firm we have statutory obligations to our staff, and these will only be fulfilled if we reduce FW and generate sufficient profit to meet our responsibilities". Restaurant owner, female aged 44).

"We have lost many customers due to not always being able to power our generator. The fact is that we cannot continue to do so without income. Where do we get the resources from? I am not sure anyone will keep powering generators when there is no increase in profit due to FW". (Hospital canteen supervisor and transport catering supplier to schools, female, 54).

"When I am unable to eat what I have paid for, or I am unable to use the resource purchased as a business, this can lead to the loss of a job because if the firm cannot sustain itself, how can it hire or retain existing employees?" (Private restaurant owner, male, aged 72)

6.1.1 Loss of economic resources and income (loss)

Loss of economic resources and income are negative impacts of FW, representing a decrease in a firm's profits. All 32 firms of the foodservice staff interviewed have had their resources and income reduced due to food waste. Interviewees are of the view that the cost of running a firm, including staff, maintenance of power generators, sales lost due to wasted food, and taxes paid are major economic losses, reducing their income. Table 6 presents empirical definitions for each category of the effects of food waste, supported by actual comments from respondents. The quotations included in the tables are representative of the respondents' meanings and

interpretations, and depth is added by the inclusion of additional quotations to supplement the

discussion of the findings in the main body.

Table 6.2 Summary of loss of economic resources and income

Types of economic resources and income waste	Empirical definition	Illustrative quotations
Staff	Staff are the human resources needed by an organisation; they represent a cost to the organisation	A supervisor male, aged 34 said: "Staff are the work force of a firm; they have a role to play every day, from procurement to processing and distribution. I am aware that we cannot function without staff, but this can only happen if we are able to retain them in our services. Where food waste has continued to be generated and revenue has consistently declined, one wonders how to retain staff without meeting their economic needs as a company responsibility". A school food supplier male, aged 42 said: "I have continued to refer to the negative impact of FW on the execution of our responsibilities, because as a firm we have a statutory obligation to our staff, and this can only be fulfilled if we reduce FW and make a profit to enable us to meet our responsibilities. "How can we allow staff to go home without wages? For me, I am afraid of what the future will be for the industry if we do not find a solution now". (Restaurant owner, female aged, aged 44)
Maintenance of power generators	Generators are mechanical machines used to power electrical appliances to perform certain functions	"The generator is the major source of power to maintain our service. We need to keep our refrigerator, air conditioning, and electricity working to keep our guests served and entertained. These things need to be maintained, but how do we maintain them when there is a loss of income and reduced resources to perform all of these operations?"

		(Restaurant manager, hospital canteen manager, college canteen senior chef, male aged 50). "We have lost many customers due to not always being able to power our generator. The fact is that we cannot continue to do so without income. Where do we get the resources from? I am not sure anyone will keep powering generators when there is no increase in profit due to FW". (Hospital canteen supervisor and transport catering supplier to schools, male, aged 34 and female aged 54 respectively.
Sales lost	A situation where revenue declines due to lack of sales	"We have lost sales due to food being thrown away as a result of leftovers, overproduction, and changing tastes. The obvious fact is that the more waste we generate, the more we throw away, and because we can't sell it, this becomes a loss for our company". (Hospital canteen manager, transport food supplier, cafeteria chef, male 51 and r kitchen manager, male aged 68. "We see these losses every day and so we have a drop in revenue too". (Mull restaurant manager, male 44)
Taxes	A compulsory contribution to state revenue, levied by the government on businesses.	The major threat to our profit is the multiple taxes we have to pay to the government through various agencies. Meanwhile we struggle to make ends meet due to the challenges posed by food waste". (Canteen staff, male, aged 48)

Source: Author's own

Some participants who are restaurant and canteen employees said that they fear soon losing their jobs if food waste continues. The interviewer posed questions to understand their views about waste generated. The majority of the interviewees strongly believed that, if the current rate of FW continues, they may be out of a job due to the ripple effect of the FW generated:

"Of course, if a firm is not making a profit, how would they (the owner) keep me?" (Restaurant chef, male, aged 47)

"Where will the firm get the money to stay in business and keep employees?" (Municipal area council staff and catering supplier to school's male 34 and female 28 respectively).

"I have told staff and colleagues that we need to work hard to avoid this waste if we want to remain in this job". (Canteen owner, transport catering supplier to schools, male, aged 42.

Participants have no doubt that their continued tenure of their current job is dependent on the firm's existence; it can only exist if it is able to make sales and record a profit.

FW has a substantial economic impact on all individuals and businesses engaged in the food supply chain. The desire to save money has been identified as a motivating factor in FW avoidance practices; consequently, recognising the economic consequences of FW may motivate behavioural adjustments in order to decrease FW (WasteMinz, 2014; Graham-Rowe et al., 2014; Quested et al., 2013; WasteMinz, 2014).

6.1.2 Environmental impact

Respondents provided some illustration of the impact of food waste. 28 respondents among those who participated in the interviews suggested that FW affects the natural resources used in food production; these are wasted energy use, wasted water, and wasteful land usage. Some quotations were extracted from the responses provided which show the participants' knowledge of the environmental effects of food waste.

Table 6.3 Summary of environmental impacts of FW

Types of environmental resources wasted	Illustrative quotations
Wasted use of land	"The land is a scare resource; therefore, proper use of the land includes using the food produced through the land". (Restaurant hotel manager, fame, aged 40). "Waste that goes to the landfill and rots produces a more handful gas than that which is produced from car". (Transport catering supplier to schools, female aged 54).
Wasted use of water	"In some parts of this locality water is scarce and it takes a lot of effort to get drinkable water from the borehole; how can we then waste the use of this water when we know how much it is needed?" "Freshwater used in global food production is practically squandered because none of the food produced with this water is consumed". (Local food vendor owner, male aged 41). "The water it takes to grow food becomes wasted if the same food that this water was used to grow is wasted". (Hospital canteen manager, female aged 45). We buy water through water tank owners to keep our fish and prepare meat, this includes water for washing, cleaning, and drinking; a waste of food at any stage is a waste of water". (Transport catering supplier to schools, female aged 28).
Wasted energy	"By discarding food, we not only waste the food itself, but also the resources and energy contained within it". (Catering service customer, female aged 45). "Food wasted and thrown away rots, releasing methane, a powerful greenhouse gas". (Hotel restaurant kitchen manager, male aged 68).

Source: Author's own

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Depending on how FW is managed, its disposal can exert detrimental environmental effects. FW decomposes in landfills, releasing methane, a greenhouse gas with 25 times the global warming potential of carbon dioxide over 100 years (IPCC, 2007). Despite the fact that 25% of US landfills sites capture methane to create power, with landfills being the country's third-largest source of anthropogenic methane due to fugitive emissions and landfills without collecting equipment (USEPA, 2011). Therefore, minimising the quantity of FW disposed of in landfills should be a key priority. Due to the high moisture content of FW, waste-to-energy (WTE) incineration is not an energy-efficient solution because it results in a lower heating value than other materials. WTE is also incapable of extracting essential nutrients from FW, thus inadequate air pollution control strategies may lead to a range of environmental contamination hazards.

Therefore, alternatives to WTE are preferred for the disposal of FW (Pham et al., 2015). FW can be beneficial if it is composted, anaerobically digested (AD), or disposed of in landfills with effective gas collection systems such as electricity and compost. FW management by informal means, such as donating it to charity or feeding it to pets, may be beneficial to the environment (Reynolds et al., 2014, 2015b). Reducing and diverting FW from landfill could drive up stagnating recycling rates and boost the environmental performance of waste management systems as a whole.

6.1.3 Social impacts

Food security, meaning the availability and accessibility of adequate and nutritious meals and nutrition, is essential for individual and national wellbeing (Soussana, 2014). Although there should be sufficient food to feed the total world population, approximately 11% is food insecure (FAO, 2015). Due to the prevalence of food instability, FW has a substantial ethical dimension (Gjerris & Gaiani, 2013). If food resources were handled efficiently and wastes were

eliminated, resources could be redirected to help feed those in need through food contributions to charities. Reynolds et al. (2015) estimate that some 921 thousand people could be fed annually if all avoidable FW in Australia were redistributed by charity. Furthermore, FW and loss increase the environmental impact of food production along the supply chain by demanding higher output than the market requirements.

Table 6.4 Summary of the social impacts of FW

Types of social loss	Illustrative quotations
Food price increase	"An increased food price does not render food available for consumption; thus a reduced price may indicate greater food accessibility for consumers". (Hotel restaurant supervisor, female aged 42). "When the supply of food is reduced due to waste at any stages of the supply chain or in food services it results in a need for extra budgeting". (Restaurant chef male aged 47).
Human health	"Humans need food which helps them to live healthily and develop both physically and cognitively. How can an individual reason properly when the nutrients required for development are lacking?" (Local community resident, District 2 female aged 41) .
Hunger	"We have seen nations where citizens can hardly find food to eat due to poverty; such nations have a population who have become a humanitarian problem to developed nations.". (Catering service customer, female aged 45) "Feeding people requires food to be available. If only 25% of the food lost or wasted worldwide were consumed, sufficient would be available to feed 870 million people". (Local food vendor customer, female, aged 39).

Source: Author's own

Consequently, minimising FW while maintaining current production levels might contribute to satisfying global food demands; essentially, decreasing FW in one place could enhance food availability in other regions (Gentil et al., 2011). If less food is wasted, agricultural land and resources can be used to cultivate food for the world's hungry (Stuart, 2009). In the light of global population expansion and increased resource scarcity, minimising FW will increase future food supply (Buzby et al., 2014 and Pearson et al., 2013). According to the United Nations, the global population will surpass 9.3 billion by 2050, necessitating a 70% increase in food supply (United Nations, 2013).

In order to feed a population of this size, pressure would increase on agricultural land and other limited resources. It is essential to determine ways of producing more food from fewer resources in order for the global food system to provide better nutritional outputs at a reduced environmental cost (Garnett, 2014). Reducing food wastage throughout the entire food chain is a crucial component of any strategy to feed the world's growing population sustainably and equitably (Foresight, 2011).

6.2 Stakeholders affected by FW.

The study provides useful information regarding those affected by the generation of FW within the sector; respondents were of the view that all stakeholders are all affected by the consequences of food waste. They expounded that everyone eats food, according to its availability, however food wastage renders it unavailable. The findings generally show that FW does have negative implications for all stakeholders, irrespective of their roles within a firm. The supply chain's value chain involves all stages and parties and is therefore challenged by the non-availability or waste of edible food.

> (Researcher) "Yes, I do agree that all are affected. In your opinion, who is most affected?"

(Restaurant manager) "To be candid, I agree with you that some are more affected than others, can you imagine what happen to the business existence when we do not see customers to patronise our business or people to work with us including the suppliers simply because we have not been able to meet up with our own obligation? Not because we do not want to do so but because the massive waste has rendered our business at lost and operation has become so low due to loss of sales and customers".

Some groups are more affected than others, according to a college canteen senior chef who is a local community resident of Garki District 1, a catering supplier to schools, and a local food vendor, who are more specific in mentioning the owners of firms and their shareholders as those most affected. They argue that these people have invested resources into the firm, and they rely on its existence and the income it provides to meet their obligations within society and to their families. Their investments are affected as a result of the loss of income, and their families, who are also dependent on the business, are affected.

Others believe that consumers are mostly affected because they depend on food services for their daily meals in order to carry out their routine activities. From all the responses, the impact of FW is significant on stakeholders, regardless of their role. As mentioned, some are more affected than others, but all are affected in one way or another. This impact poses several challenges to FW management which require a sustainable method to resolve them.

6.3 Challenges (obstacles) in food waste management

The interviewees predominantly mentioned that company managements have not taken responsibility for the challenges of managing FW in the Garki districts. These interviewees were eager to explain how FW continued to occur as a result of their management's attitudes towards its reduction. An interviewee says:

"As long as my manager continues to act and refuses to take action, FW will not stop". (Cafeteria chef, hospital canteen supervisor, hotel restaurant supervisor female aged 42)

"I have had meetings with the management about the need to bring in more experienced staff to the kitchen, but still nothing is done about it". (Mull restaurant manager, Female aged 44)

"The firm has a policy that only matters which have been decided and communicated at meetings can be implemented. We have seen reasons why other things could be done differently, but we are not allowed to use our initiative in practice". (Restaurant manager, Female aged 53).

"The management will not take our advice; I have brought staff attitudes towards FW generation to their attention many times, explaining with evidence how the chef has wasted ingredients, but the results of their investigations are unknown, and there was no feedback to me on their findings; the chef is still in the kitchen". (Cafeteria chef, Males aged 51)

Some staff believe that management does cover up and protect particular staff members. Their priority is not the FW generated, but rather the retention of a non-performing employee due to a special interest. Some interviewees explained further challenges posed by their firms.

"How can staff understand the current trends within the sector when there is no training, and no new information?" (Catering service customer, and restaurant chef, female, 34; Male 47)

"There are staff who have ideas on some of the issues but receive no opportunity to say them". (Canteen staff/supervisor hotel restaurant manager, Male aged 48).

"A meeting is a good opportunity to proffer possible solutions, although our management see themselves as all-knowing. Some staff shown no commitment to the firm by playing their own role in reducing FW". (Local community resident of District 2, catering service customer).

Many changes are needed in the dialogue between management and employees, and likewise the firms which do business with the food services sector. The participants who are employees and external stakeholders believed that they need to engage together and ascertain staff's needs, understanding from the employee perspective the best ways of mitigating food waste practice.

"I believe that working as team with both internal and external partners is necessary, although it is not adequate". (Hotel restaurant kitchen manager, hospital canteen service manager, and cafeteria chef, Male, aged 68).

"If a firm considers all of its workforce to be an integral part of the business in decision-making, the results will be positive". (Transport provider for raw food supplies, Female, aged 62).

"There is always a missing link, particularly in communication. I do believe that we need training, I have seen other organisations engage their workers in training *and development, but this sector lacks this idea". (Restaurant* chef, male, aged 47*)*.

All the interviewees believed that there is a need for the training and retraining of both management and staff to understand their different individual roles, and the need to collaborate as a single system. Some interviewees also believe that governmental regulations and policies have not been effective, although they also doubt whether there is any policy which regulates the sector's activities. Respondents mentioned that FW could be reduced only if there were enforcement of laws prohibiting the unlawful generation and disposal of waste by firms. For firms to overcome these challenges within the sector there is a need to address the concerns raised which dominated the participants' views, namely: (1) stakeholders' awareness of the level of FW, (2) buying behaviour, (3) firms' policies on FW management, (4) practices of suppliers and distributors, (5) internal practices of firms (management, owners, and employees), (6) enforcement and prosecution, and (7) firms' inadequate resources.

6.3.1 Stakeholders' awareness and practices

Stakeholders have not shown that they understand the challenges the FS sector faces due to their lack of awareness of the scale of global FW and that of Garki, Nigeria. Several attempts to reduce FW have been mitigated by certain practices including portion size control and changing the way in which stock is managed. However, this is not discussed as much as the issues of firms' internal practices where the issue of management not providing motivation to staff can act as a preventive approach to the reduction of FW.

There is a lack of awareness of stakeholders regarding the scale of food waste; some of the actors involved are customers, food service managers, staff, and external stakeholders such as the government who have shown little understanding of the effects of FW on society, the economy and the environment as well as the problems it poses to food sustainability. A respondent says:

"Honestly, I never knew that FW has become a huge issue within this industry; even though we hold discussions on the industry's development, we hardly ever discuss FW as a challenge even though it does exist". (Local food vendor customer, and restaurant owner, Female aged 35 & male aged 72 respectively).

"We have several plans on the industry's sustainability which include best practices on food handling in terms of distribution and preservation. Surprisingly, there is less focus on FW generation and mitigation. Unconsciously, less attention is paid to challenges and prevention of FW in the kitchen area". (Academic researcher in a private research organisation, male, aged 46).

FW generation and prevention is less fulfilled by other stakeholders, despite empirical records showing continued waste generation. Managers of this sector need to pay attention and make a deliberate effort to reduce food waste. This could be done by way of campaigns, training, and open conversations.

Apart from the lack of awareness of FW reduction practices as mentioned earlier, the lack of consistency in defining an 'ideal' food serving size and poor consumer comprehension of nutritional criteria may explain the low popularity of portion management as a method of reducing FW (Kallbekken & Slen 2013; Castrica et al. 2018). This is also connected to plate size and format because they typically impose subjective standards on the quantity of food a person wishes to consume (van Ittersum & Wansink, 2012; Wansink & van Ittersum, 2013). Instead of limiting portion sizes to avoid customer dissatisfaction, food service managers and staff in Garki tend to make a meal more entertaining by ensuring a relaxed setting for customers. Although this strategy may encourage restaurant patrons to finish their meals, it

does not imply reduced waste, as research shows that portion size reduction is a key component in the reduction of restaurant FW (van Ittersum & Wansink, 2012).

In an interview with a male aged 49 in a family- owned canteen the problem of adopting portion control in Garki districts meal catering business is discussed:

"We have little influence over portion size; typically, customers make their demands, and we price and provide them; accordingly, customers rarely limit themselves to the size they can eat. That is, assuming they have a firm grasp on their portion sizes … instead, what has been shown as beneficial is to already have a size measurement with price; some customers would not want to choose two of the same dishes for one meal. This has reduced FW to at least 80% of the dish in some circumstances, reducing waste".

Excess food is produced due to inaccurate demand predictions; restaurateurs should try to repurpose or re-distribute this (Filimonau & de Coteau, 2019).

6.3.2 Buying behaviour.

The buying behaviour of both consumers and institutions influences the kind of waste generated, as some consumers see buying things in excess as an expression of wealth and affluence, which in turns leads to wastage, because most of the items bought are not required for the period in question. While some consumers do not have records of their consumption over a duration of time, which ultimately leads to over-projection, they cannot consume most of the food purchased, thereby generating waste.

A kitchen manager of an hotel restaurant said:

"We lose a lot and have most food wasted when we buy items that we already have in stock and throw some away due to over-purchasing".

FW generation from the behaviours of those involved in purchasing would reduce the impact made by stakeholders to mitigate waste within the various food services. However, it can be acknowledged that the marketing approach of selling firms plays an important role in consumers' buying decisions, where a marketing campaign creates a false or genuine scarcity in consumers' minds, hence their panic buying; therefore, firms should adjust their marketing strategies accordingly (Aschemann-Witzel et al., 2017).

"Customers' shopping is largely a barrier to the improvement of food services and the reduction of food waste. Customers tend not to patronise products which do not satisfy their desires or needs; this lack of satisfaction leads to increased FW at different kitchen sites". (Local food vendor, female, aged 41),

"Some customers withdraw their custom because of the attitudes of some staff, thereby allowing food to be wasted. Some of our customers will not buy if the food served does not look fresh". (Manager of a restaurant, female, aged 40).

There appears to be a relationship between what is offered and what is purchased from food services. The firm is required to provide best customer services which include good food flavour, customers' engagement, and satisfaction as prerequisites to continued patronage.

6.3.3 Firm policies on food waste management

Food services have their own organisational practices and policies which staff and corporate bodies have to comply with. In the opinion of staff, this has served as a challenge by introducing innovation and best practice to FW management from within the sector. Some of the firms do not allow staff to hold conversations with customers on why FW is left on plates, worrying that

they cannot establish the reasons for it. Additional important challenges mentioned were the restrictions on other kitchen staff and employees from going into a store except for store managers who, if not at work for any other reason, would be mandated to act; these same staff are not conversant with the store's practice due to its policy. Complying with firms' policies is appropriate, although there is a need to provide line managers with the opportunity to use their discretion when necessary. While recognising the need to adhere to business standards, managers requested greater freedom on the ground. This flexibility could enable the food service industry to make more reasonable decisions to decrease FW whilst also contributing to the well-being of employees and other sector stakeholders.

> "We as a firm must follow our own rules as defined; we are tied to this policy restriction despite the staff's abilities to creatively reduce waste and improve efficiencies within the firm operational levels". (Senior chef in a college canteen, male, aged 50)

6.3.4 Practice of the suppliers and distributors

Suppliers' reluctance to engage in proactive environmental activities was identified as an impediment to FW reduction in Garki's food service. According to the food supply chain index assessment, Nigeria's total FW sustainability index score was between 70% and 80% (Mu'azu1 et al., 2017). Gustavsson et al. (2011) contend that this waste is caused by spills, deterioration, inappropriate management and storage, and transport to distribution sites. James and James (2010) argue that one of the most important elements of food logistics is the appropriate use of the so-called 'cold or chilled chain' to maximise the shelf life of perishable items. Some managers contended that, although the cold chain is simple to supervise and maintain after the arrival of the food to a shop, there is no control over its procedures throughout the supply phase.

Moreover, because food service operators require perishable commodities for usage and further production or processing, it must often be kept in depots for extended periods of time before being distributed to the various food service outlets. According to a World Bank report at the International Bank for Reconstruction and Development, Nigeria could meet its key policy objectives of increasing food security and decreasing food imports by reducing food loss and waste at all stages of the value chain, including distribution, by carefully implementing chosen infrastructure and technological interventions.

Figure 6.1 Tomatoes spoilt as a result of late delivery

Source: World Bank, 2020

The wasted tomatoes in Figure 6.1 resulted from post-harvest waste; a lack of infrastructure investment in storage, packaging and distribution has contributed significantly to food waste at all levels of the supply chain. Fruit and vegetables are the leading cause of loss and waste in poor nations, accounting for 42% of all developing countries' loss and waste worldwide,

including in Garki districts. Therefore, when foodstuffs are purchased, they arrive with little life left in them (Edie 2016a).

> "Quality and freshness are of the utmost importance to us. Our cold chain guarantees that none of our refrigerated items are outside a refrigerated environment within the specified timeframe. Maintaining the process helps us prevent a loss of quality along the chain. Failing to adhere to best practice means that suppliers are unable to prevent food spoilage". (Transport and catering service, supplier to schools, male, aged 42).

> "Most firms have a separate policy on their FW management practices. I do not believe that suppliers honestly work hard to avoid delays in distribution and transportation. Food vendors sometimes wait longer times to have their goods delivered, and when they arrive, they become spoilt". (Resident, Garki District 2, male aged 61).

6.3.5 Internal practices of firms

The type of operations carried out within a company impact on the sector's performance to a considerable extent. Internal working practices, which are more operational in nature, have a direct impact on FW generation. Employees are frequently viewed as under-utilised business resources in the creation and execution of strategic policies and practices for long-term success (Larsen, 2015). Bohdanowicz et al. (2011) emphasise the importance of company staff's participation in the delivery of quality services and the development of initiatives, stating that this engagement, such as employee happiness, extends beyond single stakeholders. Serafeim et al. (2012) hold that employee participation in sustainability projects saves money, promotes customer loyalty, and increases productivity. There have been instances where employees have appeared to be disinterested in FW management. However, employees' dissatisfaction with

their work positions does not, in itself, create a barrier to the reduction of food waste, albeit this is dependent on the individual's ability to handle additional, associated practices which make up the systemic process:

> "I have years of experience in the handling of FW, irrespective of management's attitude towards staff satisfaction. We as staff have the responsibility to raise awareness of the effects of FW on the environment and individual households". (College canteen, senior chef, male aged 50).

Individuals claim to go to considerable lengths to predict the number of clients they are expecting, then ordering the appropriate amount of food, according to one respondent, who mentions inaccuracy in forecasting as a preventative measure for the reduction of food waste. Forecasting is integrally associated with the ratio between the actual and projected number of customers at a food service establishment (Muriana, 2017); the (in)accuracy of this estimate influences the amount of FW (Gu, 2012). Forecasting is an example of a proactive, preventative strategy for the prevention of FW in the food service business which should be prioritised (Filimonau & de Coteau 2019; Papargyropoulou et al., 2014; 2016). Filimonau et al. (2019), contend that food services in Nigeria are more concerned with earning profits and boosting sales, particularly from the owners' perspectives, than with reducing food waste, which might have been supported by accurate demand forecasting. Gruber et al. (2016) and Pirani and Arafat (2016) support the latter position, asserting that the majority of foodservice organisations are unwilling to accept the risk of underestimating the quantity of food required to fulfil customer demand, and instead purchase more than necessary. Because Garki's foodservice strives to use locally sourced ingredients wherever possible, the results are likely to differ, indicating shorter food supply chains which are more responsive to last-minute meal order changes (Parfitt et al.,

2010). Despite the use of preventive vision, several participants remarked that projections did not always prove accurate data, resulting in waste.

6.3.6 Enforcement and prosecution

Where the environment is contaminated due to edible FW disposal, there is often no means of prosecuting offenders due to a lack of legislation prohibiting FW generation and disposal or a legal framework to enforce sanctions on offenders. Various management practices to support the reduction of FW which involve groups of stakeholders have been ineffective due to the inability of these groups to enforce sanctions such as fines and judgment, or to involve law enforcement agents for further action. The weak legal framework has contributed to the challenges faced in tackling FW generation and meeting the United Nations' sustainable development goal from the African and Nigerian perspective. FW generation has continued to occur despite various managers and stakeholders having an idea of the best approach by which to confront this waste; however, no substantive legislation and policies have been enacted by the state which allow for the arrest, prosecution, and conviction of offenders. Even though it does exist, there is no political will to trigger the application of these rules.

> "I have several times brought the attention of the local Neighbourhood Watch to the kind of pollution caused by some of the food vendors around the community. However, I am either ignored or told to encourage the practitioners to dispose their waste properly. It is funny that the responsibility is thrown back at me". (Resident of District 1, local community, female aged 42).

> "I am not in position to enforce the law, but the attitude of firms is very disappointing when it comes to FW management, especially the staff who feel they are not much affected economically". (Canteen staff, male aged 48).

Obviously, there are those within the community who feel uncomfortable observing that the rate of FW appears to be caused deliberately, with a focus on the attitudes of staff in terms of generation due to food handling, such as over-production due to poor forecasting and lack of good storage management practices. The challenges to residents and the public are how an offender should be punished for the sanction to serve as deterrent? This is a question which remains unanswered.

> "Can you imagine that even the governmental law enforcement agents are also customers, for example the Abuja Environmental Management Board patronise some of these food services but look the other way. Corruption is an obvious factor affecting the government's implementation of environmental law against offenders". (Customer who is a bank worker in a facility canteen male aged 49).

6.3.7 Inadequate resources of firms

There is huge gap in the role of mobile technology in the prevention of food waste. The availability of smart phone technology, if adopted, could reduce FW generation within the Garki districts, as it has played a significant role in the developed world. For example, the 'Too Good to Go' smartphone app, which is growing in popularity in Europe (TGTG, 2019), enables food services to sell extra meals at substantial discounts in return for clients picking up their meals at the end of the business day, as opposed to providing meals on the premises. As a result, this technological solution can help the sector to both divert FW from landfills and also increase profitability and customer loyalty. Although none of the participants used smartphone technology to redistribute leftover food, they all recognised the technology's tremendous potential to minimise FW and increase business profitability. Some participants discussed the way in which smartphone apps which redistribute leftover food could appeal to the expanding

market of 'millennial' consumers. This may be due to the fact that Millennials are more inclined to patronise foodservice firms which include environmental sustainability themes in their everyday operations (Jang et al., 2011). Participants in the focus group provided views from their various experiences such as this canteen service owner, female aged 49).

"As you can see, even the venue we are using right now has always been a busy place for customers, but no longer because we have discontinued certain services due to lack of resources, and this is the issue everywhere now; can you imagine how much it costs to power a refrigerator?"

A hospitality catering service manager, male, aged 44 added that: "Honestly, we have reduced the need to preserve food these days; we just try to make what we can sell one day ahead because our income has reduced, and staff wages are reducing likewise".

The impact of resources on firms cannot be unstated, as their lack has negatively impacted on businesses. For example, a restaurant manager, female, aged 44 in Garki District 1 explained during the discussion that:

"We used to prepare over 2000 plates of fried rice and similar size bowls of porridge beans two years go, but due to the heat this food gets spoilt within hours because there is no other way of preserving them for a whole day".

The understanding was clear that FW has brought uncertainty to the sector and the stakeholders have expressed their worry about its implications. In this case, the sector has continued to reduce it staff strength and space call for intervention.

"I am honestly worried about losing my job, due to the reduction in profit food". (Transporter, male, aged 42).

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"Yes, I feel the same". (Local food vendor, male, aged 52)

Despite the challenges facing the sector, the individual stakeholders' presence within the firm based on the various roles they play could provide a sustainable solution to the problem of FW. There is a need to reduce the quantity of waste recorded, without which there is the likelihood of a business closing, which is a frightening situation. In the absence of appropriate technological alternatives, Garki food services redistribute excess food by selling clients additional portions to take home. These are meant to restore the value of plate remnants so that customers perceive them as food rather than refuse (Bozzola et al., 2017). However, increasing the quantity of food offered to late clients as the day progresses does not appear to be a welcome solution, and customers often decline the enormous amount offered. To summarise the discussion on the impact and challenges of food waste, all the responses from the interviews and discussions held are interrelated across the various types of food services outlets. The views of the interviewees were categorised to three broad areas relating to the impact of FW on the economy, the environment, and society. The interviewees, many of which are employees, fear that they may lose their jobs if FW continues, while owners believe that the loss of sales and profit may force them to pull them out of the sector. All respondents believe that the sector's stakeholders need to work together and complement one another, rather than concentrating on the competition.

6.4 Firms' approach to the mitigation of food waste generation

The interviews exposed several managerial approaches to food service waste generation in Garki districts, Abuja, Nigeria (Figure 6). The understanding and response of the interviewees shed light on the various potential approaches to FW management within the food service sector. The 32 respondents were active in the conversations during their various individual interview sessions. Four categories represent the process of understanding the approach to the

reduction of FW in the FS sector of Garki districts Abuja; these are namely: training, accurate forecasting and menu planning, monitoring, supervision and reporting, awareness creation and education. Participants provided elaboration of the efforts their firms are making to reduce food waste, whether this effort is worthwhile, what stakeholders do onsite to reduce waste, and suggested any other effective approaches to the reduction of food waste, including who should become involved in its reduction.

Participants provided information on their perceptions of ways in which to reduce food waste, what efforts have been made by their individual firms to reduce it, and whether these efforts are showing any progress. In addressing the question further, respondents explained what they do on site as stakeholders to reduce food waste. During the interviews, respondents made it clear that all stakeholders should become involved in FW reduction, irrespective of their roles or positions within a firm. Some of the respondents such as the Mull restaurant manager, local community Residence District 11 went on to suggest additional ways of reducing FW that had not been previously mentioned.

Interviewees were asked a specific question which focused on the efforts their respective firms were making to reduce food waste. All respondents agreed that a sustainable approach was required for the reduction of FW. The massive volume of FW evidenced in several empirical studies such as the current one, is alarming. Therefore, this was an area of interest to all of the interviewees; this was observed from their various levels of attention and interest in addressing the questions posed to them. The majority were of the view that the current efforts staff make to speak to one another during and after work on the impact of waste generation is a welcome idea, which should be sustained. Also, firms are trying to organise workshops and seminars, inviting relevant stakeholders within the FS sector to make presentations on the implications of food waste. The essence, in the opinion of the interviewee, is to remind staff and

management of the challenges of FW and the benefits of reducing it for the economy, the environment, and society as a whole. Some of the responses were as follows:

"Into many efforts have been made to reduce waste. However, some of our meetings at middle management level have concluded that there is a need to provide a scheme which considers the future of staff in the workplace and other bonuses and incentives to retain their motivation and see themselves as shareholders". (Hospital canteen manager, transport catering supplier to schools, college canteen senior chef, male aged 44, female aged 54 and male aged 50 respectively).

"All the noise we have made has received no response from senior management who formulate policy direction for our operations, so we want to see what happens next. At my level as a supervisor, I always make sure that materials are well-utilised, and staff are monitored all the time". (Canteen customer and bank staff, Male aged 49).

"Our management has recently educated our staff on the need to use the FIFO (first in first out) storage system in the kitchen to reduce and avoid the expiry of ingredients". (Hotel restaurant supervisor, female aged 42).

"Cooking and menu planning which allows for the customers to request a portion size rather than presenting a portion size which is pre-determined by the firm". (Catering service supplier to schools, female aged 40).

"FW monitoring and reporting provides information to managers about strategies for the reduction of FW". (Canteen owner, fame aged 49).

"There is a need for customer awareness of food waste. We have made some banners which will be in place in a couple of weeks with the inscription 'Why waste food?'. This is designed to remind customers of the need not to leave food on their plate". (College canteen senior chef, male aged 50)

"Unsold food could be put to other uses which are beneficial to humans by being repackaged or preserved". (Restaurant chef, male aged 47).

"The use of technology has helped to improve our service process; I believe that it is important within the sector. This approach dominates food services in developed countries and helps to reduce food waste". (Transport catering supplier to schools, male aged 42).

The majority of the interviewees believe that they have to continue to pressurise their leaders to change their attitudes towards their management style so that they develop an all-inclusive approach to the management of food service because the demand is huge and the challenges are significant. Interviewees were asked whether there were other efforts to be made because most earlier attempts had not yielded any meaningful results. They concurred that much has been done, although they will be pressuring their leaders on the need for reform and different practice, including holding meetings, briefing staff, talking, reviewing suggestions, and understanding the critical roles of other colleagues.

The majority of the respondents believed that firms' efforts have yielded no significant progress in the reduction of food waste, especially at management level. They believed that they would continue to monitor FW and involve themselves in the day-to-day operational activities of the business; they were optimistic about creating a better food service sector.

Interviewees who are directly involved in food service operations such as management, kitchen, and service, were asked about their day-to-day roles and how they affect the generation and reduction of FW. The majority of the respondents explained that they are involved in everyday activities, providing leadership by undertaking action and supervising. One of the interviews said:

> "I *get* involved in the activities of the day's work. My understanding is that if I do not do what I have asked others to do, how will I get the results I have asked for and provide a better service? I therefore work in the kitchen carrying out food preparation, serving customers, and organising distribution, so I know what is happening and what the staff are doing". (Hotel restaurant kitchen manager, Male aged 68).

This demonstrates that staff are aware of the fact that involvement is necessary for the proper management of FW within food services. Others also believe that continuous engagement with the entire operational system is a means of reducing food waste:

> "As a kitchen supervisor, I ensure that quality specifications are followed and that the correct quantity of ingredients required are used". (Hotel restaurant supervisor, female aged 42).

> "I oversee the ordering and service of the menu at the restaurant. Sometimes the wrong order is served, so I make sure that this does not happen often. If it does, I rectify the situation so that it does not result in waste". (Hospital canteen supervisor, Male aged 34).

All the interviewees believe that the management of staff and resources requires those with responsibilities to additionally involve themselves in routine activities. It is easier to direct staff

when there is involvement by managers. The majority are of the view that they have been actively involved in the everyday running of their firms at the middle- and low levels of the firm's operations, where they have less authority to make decisions.

The majority of the interviewees believed that a lot has been suggested as means of reducing FW at the start of these conversations. However, few of the interviewees have alternative suggestions.

> "Temperature control, to an appropriate degree is required for specific items especially when food is in the fridge or being transported to the fridge". (Transport catering raw food supplier, female aged 62).

> "As a service operating in the food sector, it is important that we are aware of the season in order to predict and properly manage it, along with market demand and supply". (Cafeteria chef, restaurant owner, male aged 51 & Male aged 72).

> "You know that training is key in reducing food waste. It will not be successful without proper supervision, as I previously mentioned". (Hotel restaurant supervisor, female aged 42).

Stakeholders are aware of the importance of working as a network system in which each individual role is a core integral input to waste reduction and a means of improving performance. The findings of the research in this regard show that the practices of all stakeholders and what they do are the determinants of what happens within the sector.

Interviewees were asked by the researcher who they believed should be involved in the reduction of food waste. Respondents concur that it is the responsibility of all stakeholders to become actively involved in efforts to reduce FW in the food service sector. The idea is that

everyone eats food, and the lack of food has implications for all. This is a question which sparked the interest of one of the interviewees, who expressed his view as follows:

> "I am a sociologist and academic. I understand the need for people to take responsibility and ownership of what they actively become involved in. We all see the waste within the food service and the rate of hunger within society. Therefore, all individuals and groups which have a stake should be involved. I am involved and interested in this discussion because I know the benefits of reducing food waste. I am also playing my role in providing an input on how FW can be reduced." (Academic researcher, male, aged 46).

Respondents using the term: 'all stakeholders' are simply expressing themselves in the context of this research, which includes the government and its agencies, customers, the community of management, owners, and suppliers, research organisations, and the entire firm structure.

> "The impact of FW is very noticeable here, so everyone, including the local community, should speak and ask questions about how its impact will affect the health of the people in this environment". (Local community resident of District 2).

The findings provided eight emerging categories which represent the process of understanding the approach to the reduction of FW in the FS sector of Garki districts, Abuja; these are namely: training, forecasting and menu planning, monitoring, supervision and reporting, awareness creation, and education.

6.4.1 Training

According to the study, familiarity with processes, understanding of new recipes, and general job performance all have effects on the growth of kitchen FW reduction. When dividing the

cooking and meal preparation process into stages, the capacity to anticipate and evaluate future scenarios is necessary. The ability of employees to use 'common sense' and to learn from their mistakes, as well as their willingness to assume responsibility for accomplishing assigned tasks, are all outcomes of training.

"Managers have begun to see the need to train and educate staff; our management recently agreed on a plan to organise workshops for all members, discussing issues relating to efficiency. For, example, I was taught the FIFO and LIFO stock management while in the Polytechnics but have not seen this in practice; the staff who did not attend higher education would not know these approaches to stock management in the kitchen to avoid wastage". (Hotel restaurant supervisor and college canteen senior chef, female aged 42 & Male aged 50).

FW prevention could be accomplished by use of the abilities that kitchen employees have acquired over time, either through official training or on the job. The appropriate order of food provided in either a buffet service or by kitchen staff to dining, suitably extended mealtimes, displayed portion sizes, appealing buffet serving locations, and appropriately-sized serving equipment were identified as measures to prevent buffet waste. Finally, kitchen staff should be trained to make greater use of uncooked resources, as well as to the promotion of innovation in menu development and the reuse of leftover and surplus food items. For example, chefs can be educated to prepare servings which meet the needs of their customers (Betz et al., 2015). Similarly, kitchen staff's plating abilities should be enhanced so that no food is not wasted for aesthetic reasons (Charlebois et al., 2015).

6.4.2 Forecasting and menu planning

Overproduction of meals is the primary cause of FW during food preparation. This typically results from errors in demand forecasts (Silvennoinen et al., 2015). Rather than relying on operational 'guesstimates' of the amount of food necessary, a foodservice operator can employ more advanced forecasting techniques to decrease the likelihood of food shortages (Filimonau et al., 2019a). Periodic inventory audits should also be performed, and the first-in-first-out strategy should be used, ensuring that stored food items are consumed prior to the addition of fresh products (Charlebois et al., 2015).

> "As a service provider in the food sector, it is important that we understand the seasons in order to manage and properly predict the quantity of food to prepare". (Restaurant owner, male aged 72).

> "We plan menus which allow for the customers to request for a portion size rather than presenting a portion size at the discretion of the firm". (Mull restaurant manager, female aged 44).

Cooking and menu design can also entail a greater frequency of seasonal ingredients (Gossling et al., 2011) and a higher degree of portion control by allowing clients to choose their desired portion size (Kallbekken & Saelen, 2013). This meal service firm delivers small amounts if requested by visitors, as well as small quantities, especially for young people. This is an excellent business strategy to both reduce food waste and control income in the context of Garki food service shops, because smaller servings may be priced lower (WRI, 2013).

In addition, when catering for large parties and events with considerable food waste, the number of visitors should be re-confirmed to minimise overcooking (Papargyropoulou et al., 2019). When forecasting fails and accurate guest counts cannot be determined, excess food can

be redistributed to faith-based organisations and other non-governmental organisations who are active in food redistribution and the feeding of people on the street, as seen in Garki and other western regions of Nigeria. In general, lengthy menus should be avoided so that a meal service provider maintains a small food supply that can be quickly refilled and/or reused (Filimonau & de Coteau, 2019).

6.4.3 Monitoring, supervision, and reporting

The most common practices in the FS sector are the monitoring, supervision and reporting of food preparation, distribution, and control through employees who are trained in the area of best practice in food handling. Empirically, there is some support for positive relationships between stakeholders (Balser & McClusky, 2005) which potentially facilitate good practices. One aspect which requires these practices includes reporting of the approaching expiry dates of foods and the suitability of food for human consumption.

> "FW monitoring and reporting provides information to managers on strategies for FW reduction". (Academic research organisation employee, male aged 46).

> "The noise we have made has received no response from senior management who formulate policy for our operations, so sometimes we want to see what happens next. At my level as a supervisor, I have always ensured that materials are well-utilised, and that staff monitored continuously". (Restaurant chef, male aged 47).

> "As a supervisor in the kitchen, I ensure that quality specifications are followed and that the correct quantity of stuff required is used". (Hotel restaurant supervisor, female aged 42).

There are private and public initiatives through the country's agencies which perform a supportive stakeholder's role and the have the statutory responsibility to monitor, supervise, and report waste; agencies include the Abuja Environmental Protection Board (AEPB), the Federal Environmental Protection Agency, Abuja Municipal Area Council (AMAC), hotels, restaurants and caterers (HORECA and Garki waste disposal agency). These are tasked with the monitoring and control of all waste-related activities in commercial, industrial, and construction sectors, as well as ensuring a safe living environment and population health.

6.4.4 Awareness and education

Growing understanding of the significance of the issue of FW has led to the development of public awareness programmes designed to support management and engage consumers in its reduction, although no specific awareness campaigns against FW have been developed. However, NGOs, AMAC, and other private initiatives have always raised concerns on FW in Garki; for example, one of the participants in the focus group discussion insisted that, on many occasions, he has been involved in raising awareness of the need to avoid food wastage. In his own words:

> "I have spent all my life in and around this area and have seen people begging; let us not pretend that this does not happen. Outside, around the Garki international market, you will see children between the ages of five to 14 begin with plates in their hands while there is waste food in the various outlets, so I have consciously always advised people who go out to buy food not to throw it away if they cannot finish it".

Most of the managers believed that they should firstly perform an oversight function, the essence of which is to educate people, especially their staff, to understand the impact of food waste.

"I get involved in the doing the day's work. My understanding is that if I do not do what I have asked them to do, how would I get the results I have asked for, and provide better service? I therefore work in the kitchen on food preparation, serving customers, and distribution then I know what is happening and what the staff are doing". (Hotel restaurant manager, male aged 68).

Other private individuals continued to talk about FW as part of their programmes when addressing environmental sanitation. For example, the Nigeria Royal Ambassadors, a faith-based organisation, has over the years organised environmental cleaning, leading them to question the cause of environmental pollution and landfill due to food services waste. However, despite all this effort, others believe that nothing appears to be changing.

"At my level as a supervisor, I have always ensured that materials are well-utilised, and that staff monitored continuously". (Local food customer, male aged 47).

"There is a campaign to raise customers' awareness of food waste. We have made some banners which will be displayed several weeks from now with the inscription: 'Why waste food?' This is designed to remind customers of the need not to leave food on their plate". (College canteen senior chef, male aged 50).

There is a need to provide a framework to address the sectoral challenge of FW. A collaborative initiative can support companies' management by focusing on the necessity and action of raising customer awareness, promoting research on FW mitigation in Nigeria and in the context of Garki food services. The table below summarises the practices engaged with by individual firms to reduce food waste.

Table 6.5 Summary of practices to reduce FW within firms.

Approaches	Selected illustrative quotations
Training	"Our management has recently educated our staff on the need to use the FIFO (first in, first out) storage system in the kitchen to avoid and reduce ingredients with expiry dates". (Hotel restaurant supervisor, college canteen senior chef, male aged 50)
Forecasting and menu planning	As a service provider in the food sector, it is important that we understand the seasons in order to manage and properly predict demand, and also market supply and demand". (*Transport catering supplier to schools, male aged 42*), (Restaurant owner, male aged 72) "We plan menus which allow customers to request a portion size rather presenting one already determined by the firm". (Mull restaurant manager, female aged 44) "Towards the close of business, we increase portion size at the same regular price just to get rid of leftovers and avoid them being thrown away". (Mull restaurant manager, female aged 44)
Monitoring, supervision, and reporting:	"FW monitoring and reporting provides information to managers on strategies for the reduction of FW". (Academic research organisation employee, male aged 46). "I get involved in the doing the day's work. My understanding is that if I do not do what I have asked them to do, how would I get the results I have requested and provide better service? So I work in the kitchen on food preparation, serving customers and distribution so that I know what is happening and what the staff are doing". (Hotel restaurant supervisor, female aged 42).
Awareness creation and education.	"There is a need for customers' awareness of food waste. We have made some banners which will be displayed in several weeks from now with the inscription: 'Why waste food?' This is designed to remind customers of the need not to leave food on their plate". (College canteen senior chef, male aged 50).

Source: Author's own

In summary, efforts are in place to reduce food waste. FW issues are a global concern, with all stakeholders being affected; therefore, the reduction of FW in the food services sector is a

major concern in the study's context. Individual firms have made efforts in diverse ways; some are on site, where managers and owners get involved in the operations of the kitchen to provide supervisory support by carrying out the work with staff. Other approaches have been suggested by stakeholders on FW reduction, such as reporting of waste and improving an open communication among stakeholders.

6.5 Multi-stakeholder practice approach to FW management

All interviewees actively participated in discussion of the various practices by all stakeholders in the foodservice sector within the study context of Garki District, Abuja. Results from all 32 interviewed organisations provide an understanding of the various inputs and conversations the different stakeholders are aware of, and have been involved in, on the subject of how to reduce FW from their different perspectives, and how approaches have been adopted within their firms.

Eight sub-categories in this section represent the multi-stakeholders' practice approach to FW management in the Garki District food service sector, namely, to understand that participants are familiar with the groups of stakeholders associated with their firms and how they have impacted them, to also understand whether the firms' stakeholders have the required capabilities to address FW issues, and to determine whether the stakeholders have impacted the sector in the reduction of FW within Garki District. It also provides for discussion of the role of innovation as a tool for company performance from the perspective of the sector's engaged actors if that is the case, and how stakeholders have collaborated to adopt the use of innovations and in which operational processes (see 2.4.3, and 2.4.4 pre-kitchen, kitchen, post-kitchen). The interviews extend the discussion of how the stakeholders' role influences the handling of food at the operational stages of their firms, which is a core aspect of food service and FW generation. The study seeks to learn about the results of these stakeholders' practices

in their firms and to know whether they have generated any positive results within the FS sector for the reduction of FW.

Regarding the many stakeholders' participation in FW reduction, Büthe (2010) suggests a classification based on the nature of their operations. Each stakeholder can be categorised in more than one category, as shown in Table 6.6, which illustrates the study's findings on stakeholder involvement, categorising the role of stakeholders in the reduction of FW. Although 32 stakeholders were analysed during data collection, these results are indicative of the food service industry in Garki, Abuja, given that this is the first project to decrease FW in the country from the perspective of multi-stakeholder practice. Therefore, these stakeholders are the first to voluntarily debate this matter in Nigeria. More in-depth research into the role of stakeholders in the FW agenda in a developing nation has enabled this study to empirically establish the following categories relating to different stakeholders and their practices in relation to FW in Nigeria.

The public, the food service host community, researchers' public organizations, school proprietors, and non-governmental organisations (NGOs) have all been calling for policies and regulations to address the environmental concerns of FW pollution in the federal capital territory (FCT) Abuja, in which Garki district is located.

The reduction of FW is generally important to all interviewees to the extent that categories were identified as major factors to help reduce FW, with practical solutions suggested for the management and reduction of FW practice. As this study and data centres around the reduction of FW, specific general categories were identified as the core focus areas, specifically: internal, external, and collaborative, while other sub-categories were defined as surface process and storage management, staff capacity, kitchen innovation, menu planning, and stakeholders' engagement. Open communication with stakeholders and monitoring and reporting are also

collaborative categories and the external categories address suppliers and policy formulation
and implementation.

Table 6.6 shows the summary of interview and focus group results from multi-stakeholders'
views on approaches to the reduction of FW, with recommendations for mitigations:

Table 6.6 Results on possible mitigations for FW problems from the multi-stakeholder-practice approach

General categories	Secondary categories	Mitigations
Internal management practice	Process and storage management	Improve firms' forecasting systems using available data
		Food service businesses to improve inventory management.
		Adoption of the 'first in, first out' system of stocktaking
		Firms need a technological approach to inventory systems.
		Better rewards for good practice in food handling.
	Staff capacity	Improve staff competence through knowledge, skills, and techniques.
		Identify and patronise suppliers who provide clean raw materials such as vegetables.
		Service quality delivery.
		Employ experienced staff.
	Kitchen innovation	To go from serving lunch/dinner in pre-determined portions to catering to customers' specifications.
		Innovative meals help to maximise the use of all food ingredients including fruit and vegetable peelings.
	Cooking and menu planning	Matching menus to actual customer plate demand
		Proper use of ingredients in terms of quantity and quality.
		Portion and plate size control reflecting prices based on customers' needs.

Stakeholders' collaborative practices (core and supportive)	Stakeholders' engagement	Establishment of clear communication between multiple stakeholders
		Establishment of standard operating procedures.
	Open communication	Providing information regarding menu quality and quantity.
		Allowing for consumers to make a variety of choices.
		Providing in- and outdoor reminders of zero-FW initiatives.
		Food service businesses and consumers to work on promoting awareness of FW by explaining the need to take food home.
	Monitoring and reporting	Providing information to stakeholders regarding FW reduction practices.
		Sharing and reporting FW generation to relevant stakeholders for control and policymaking.
External actors practice	Suppliers	Improved management and planning.
		Regulated processing establishment.
		Efficient delivery (time, place, quantity).
	Policies and regulations	Introduction of firms' regulations for waste management.
		Law enforcement against inappropriate FW disposal.
		Policies against the sale of inedible food.
		Clearer and more supportive policies for food donation.
	Consumer education	Advocate for empty plates.
		Establishment of sustainable consumption practices as the social norm.

Source: Author's own

6.5.1 Internal management practices for the reduction of FW

In terms of internal remedies, according to the conclusions of the analysis provided by this study, there are five sub-categories: storage and process management, staff capacity, kitchen innovation and cooking, and menu planning.

6.5.1.1 Storage and process management

For food management systems, a better forecasting method based on more accurate sales data is advocated, which aligns with prior research (Gu, 2012), along with the use of food with an earlier expiry date. It is possible to implement digital systems, although the associated investment expenses are a major concern. A transparent system of sanctions and rewards is important for effective FW management; interestingly, throughout the interviews, supervisors who were asked by a restaurant owner to represent these based on their professional knowledge and long experience said that they have always found ways of rewarding good work and have set a performance and evaluation indicator on waste management and store keeping because they believe that FW is dominant at store level. In their own practice, the number of times when waste from the store is identified gains a minus from the benchmark set, while a plus is given to the team if it is negative or less within a specific period.

> "I feel more motivated now than previously. The manager comes into the kitchen every day to access our performance and how we handle the kitchen in terms of washing food materials, cutting, and packing. These are areas where things have gone wrong in the past when staff would do exactly what they liked. I believe the supervision and motivation for good practice has been encouraging". (Restaurant supervisor, female aged 42).

This approach may not appear adequate or sufficient, but it acceptable in this discussion as ideas proposed. Further conversation revealed that, in addition to storage management,

avoiding waste at the processing stage is vital especially when washing vegetables, cutting fruit, and processing meat, especially if this cannot be directly served; it needs to be well presented. In Garki, because the FS sector is booming with an increased number of local food restaurants, standardisation is of particular interest in the Garki context. Possible actions could include providing guidance and examples of good practice on how to best clean fruit and vegetables with the aim of minimising waste. The study model is illustrated in Figure 7.1 below.

It is evident from the research model of the study how food service stakeholders in the form of customers, academics/researchers, local residents, food service firms, governmental agencies, NGOs, suppliers, and staff of the local area council link together to carry out practices comprising: internal management practice, stakeholders' collaborative practices, and external stakeholders' practices. Further, the research framework (Figure 6.2) enables the comprehension of the practices which could be carried out in the various food service outlets with the aim of reducing food waste in the food service sector. Non-compliance with some of these practices by the sector's stakeholders may hamper the determination to provide food for the world's growing population; this would continue to pose a challenge to the actualization of the millennium development goals of the United Nations.

6.5.1.2 Staff capabilities

Staff require training to help build their capabilities and to develop a good sense of judgement. Because the sector deals with people who have stakes and influence, it is important to engage in good communication with them, including external and all internal stakeholders. The study identified the fact that there is low and weak understanding of this issue, thus the organisation of workshops, training and formal education are strategies for the sector. As mentioned by some of the stakeholders, all respondents concurred that their management should be proactive

and identify the need to improve staff skills and knowledge. Firms' managements need to improve staff competence through knowledge in other to build their skills, and techniques which help to identify and patronise suppliers who demonstrate good practice and quality service delivery. Employing staff with experience who are well-trained and keen to improve their capacity is an effective strategy.

6.5.1.3 Kitchen innovation

Kitchen managers were of the view that food service require a diverse kind of innovation, some of which are on the operational side of the kitchen for improvements and the use of technological features. All innovation is a process because it requires integration at all levels of the kitchen, because the majority of FW is generated there. Process innovations are operational improvements which allow for modification of how operations have been carried out in restaurants and other food services outlets; however, local vendors see innovation as being capital-intensive. However, innovation can concern the way in which services are delivered, and not necessarily the use of technology. Among a restaurant's regular procedures are: menu creation, ordering, and service, as well as efforts to reduce and recycle refuse.

> "I have always advocated for the adoption of new practices and routing in a way which reflects the new and dynamic market environment in which we operate; most of my message to staff is to feel free to do things differently, and to present themselves for the various training sessions we have developed in-house, seeking further learning to enable them to make sound decisions". (Restaurant manager, female aged 40).

> "I believe that it is high time for technology to be used as a tool for waste management. The kind of waste generated at the store and during food processing is alarming. The food service industry does not have a reputation for

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being highly innovative or for having a learning culture (Rodgers, 2007), although it needs to understand the potential benefits of doing things differently. Our service is gradually changing in terms of Seating and serving arrangements, and we no longer approach customers when they are in conversation to ask for their order; instead, we encourage them to come forward to place orders at a time that suits them. This has been made possible by the expansion of our restaurant spaces and furniture". (Supervisor in a publicly owned canteen, male aged 34).

Therefore, innovation in the kitchen is specific to individual culinary establishments. Serving smaller and different-sized portions is a frequent process optimization which decreases food waste. It is also important to take a fresh approach towards menu processing and ordering, because this can be an efficient means of reducing food waste, although it requires the participation and coordination of all stakeholders. Innovation, particularly the use of technology, may also help to decrease FW by addressing leftovers, thus lowering the quantity of FW restaurants have to process, increasing profitability and attracting new customers by presenting a favourable image of the business.

6.5.1.4 Cooking and menu planning

Cooking and menu design also entail more frequent use of seasonal ingredients (Gossling et al., 2011) and a greater degree of portion control by allowing clients to choose their desired portion size (Kallbekken and Saelen 2013). For example, in MENUMENU (not real name), the supervisor stated that a group of non-governmental organisations (NGOs) provide food to people on the street who are perceived to be hungry, which they pre-order on specially designed plates and submit in advance; this has been regular practice for the past three years, and portions are designed to accommodate a range of ages.

In previous studies, portion sizes have frequently been discussed (Heikkila et al., 2016; Wen et al., 2015; Spang et al., 2019). Results from both the focus group and the interviews revealed that the average consumption of particular sauces and side dishes might influence the amount of FW generated at tables, hence potentially reducing food waste. There is more food menu control in the restaurant context than by local food vendors; reduced portion sizes lead to less waste than large sizes.

6.5.2 Stakeholders' collaborative practice for the reduction of FW.

The essential purpose of the stakeholders' collaborations is to jointly address food waste issues through a combination of efforts involving engagement, communication and monitoring, and reporting of stakeholders and firms' activities.

6.5.2.1 Stakeholders' engagement

Stakeholders are individuals, groups, or organisations which are, or might be, affected by company choices, and who can potentially influence those decisions (Freeman, 1984). A variety of stakeholders are involved in firms' management and collaboration, including employees, owners, managers, governmental agencies, suppliers, customers, community members, research organisations, and non-governmental organisations (NGOs). Recent research has begun to emphasise the significance of multi-disciplinary, system-wide approaches to waste management which involve stakeholder participation (Thyberg & Tonjes, 2015). Firms should involve stakeholders in the creation of sustainable food service plans while addressing their expectations for a more sustainable, waste-reduced society or environment in order to create collaborative partnerships with them (Jang et al., 2017). The management of FW is a complex process requiring several methical, multidisciplinary systems management approaches to support the development, implementation, and maintenance of sustainable food

service systems. The participation of a number of stakeholders in the creation of food waste prevention policies creates the potential for effective cooperation.

FW reduction requires specific ways of doing things from a combination of efforts by these multiple stakeholders in the sector (companies, governments and agencies, suppliers, customers, community members, research organisations, and non-governmental organisations (NGOs) who need to build strong links and cohesion. The European Union has emphasised that addressing FW requires all stakeholders to work together to better comprehend, identify, monitor, and develop solutions for food waste. All participants in the food chain should work together to develop solutions. The waste management framework supports discussion and the inclusion of these stakeholders' concerns in policy development (Thyberg & Tonjes, 2015). Furthermore, effective refuse management requires stakeholder participation, communication, and outreach. When the public and stakeholders are well-informed on policy alternatives, the significance of efforts, and involvement channels, better decisions and outcomes will ensue.

6.5.2.2 Open communication

Open communication affects the quantity of kitchen, buffet, and plate waste generated; without communication information is not transmitted, rendering work more difficult and negatively impacting the workforce's client interactions. Communication about orders is necessary among suppliers and customers, as well as among staff within an organisation. The results indicate that the generation of kitchen waste can be reduced by enhanced communication, for example when responding to concerns about low-quality items or incorrect delivery. Reaching an agreement on appropriate portion sizes which impact plate waste necessitates communication between the person placing an order and the producer regarding, for example, information about products which will soon expire and/or about expiry dates or spoilage; these factors influence product rotation and prevent the use of out-of-date food. Communication with

customers occurs, for example, when there is a need to educate them on the contents or nutritional value of portions and meals as products, or when it is necessary to train youngsters on appropriate mealtime behaviour in a school or nursery setting.

If a business so chooses, consumers can also be informed about food-related issues such as the environmental impact of their meals. Understanding and communicating with consumers are key to creating and growing customer satisfaction. This study's findings indicate that communication can be enhanced by the use of notice boards, printed communications, and/or instructions. In addition, it is essential that employees know where to locate the information they want, or whom to ask. Mass caterers such as schools and staff restaurants can optimise their information flow by advising their employees in advance about absences and activities which potentially affect the number of diners expected; preparing the appropriate amount of food can exert a direct impact on the amount of food that is wasted.

6.5.2.3 Joint monitoring and reporting

The need to monitor and report the various FW challenges is vital to the sector's growth, being the collective responsibility of all stakeholders. The monitoring of FW may result in a redesign of the entire cooking and dining experience, based on recent discoveries. Quality and safety can be ensured through monitoring and reporting what is learned; this requires that food issues are handled in a specific way. As a sector with multi-stakeholder monitoring, processes should be carried out individually and collectively, with reports being openly shared amongst stakeholders in order to track and identify potential issues and concerns over the safety and quality of food products.

> "All stakeholders must understand the challenges to FW and work together. The
> sector has unique similarities in its various outlets in terms of waste generation,
> therefore reporting to one another as issues occur would serve as a guide for

others. The management of the sector must be collective". (Academic research
organisation, Male aged 46).

The issues of FW monitoring and reporting in Garki have not been combined as an initiative
for all actors to follow, although there are governmental and voluntary agencies who can report
and monitor. According to the World Bank's 2012 Urban Development Series publication, Sub-
Saharan Africa generates around 62 million tonnes of waste annually, with each individual
generating an average of 0.65 kg daily (The Guardian, 24th May 2018). By 2025, it is
anticipated that the yearly output of urban refuse in the region will reach 161,27 million tonnes.
This research and Nigeria's population record that the country produces 43.2 million tonnes of
refuse annually; this is an increase to the global waste record expected to raise to 2.2 billion
tonnes per year by 2025 (Orhorhoro & Oghoghorie, 2019). Therefore, there is a need to act
collectively as stakeholders to address food waste by monitoring and reporting; this involves
the Abuja Environmental Protection Board (AEPB) and Federal Environmental Protection
Agency, Abuja Municipal Area Council (AMAC), and hotels, restaurants and caterers
(HORECA and Garki waste disposal agency).

6.5.3 External stakeholder practice to FW reduction

This section elaborates on Table 6.6 above. The section aims to consider in detail the role of
external stakeholders' practices in FW reduction from the perspectives of groups of
stakeholders, specifically suppliers, policy and regulations, and consumers. From the
perspective of the study participants, these three aspects of practices are believed to be lacking
and strongly required for the growth and sustainability of the food service sector. Suppliers are
critical players in the food system; their practices define the outcomes of the value created
within the supply chain system. Various stakeholders, such as firms and the government, play
a role in the development of policies and regulations for management of the food sector. The

idea of developing legislation to help address the growing concerns about FW is key to the integrity of the sector. This policy could include reference to the education of customers on the magnitude of FW, and how their behaviour could impact its growth.

6.5.3.1 Suppliers

During the interview and focus group discussion, participants who were familiar with procurement and storage systems within the pre-kitchen believed that improved communication with clear messages on what should be purchased needs to be prioritised and should be made clear when placing orders with suppliers. Staff working at kitchen and pre-kitchen stages need to be mindful when placing orders and receiving deliveries of orders in order to avoid unnecessary cancellation, which could lead to waste. Studies have concluded that certain distributors enjoy a buyer privilege allowing orders to be cancelled, which brings about wastage (O'Connor et al., 2014). A food service buyer's privilege to cancel an order of raw materials when the standard is not followed by an upstream supplier and the food is rejected could cause further waste. It is necessary to adhere to standards of procurement to avoid the possible rejection of food supplied by buyers. Clear communication would decrease the probability of incorrect ordering by removing procurement errors because reasonable standards would have been guaranteed.

Food service businesses should regulate supplier management practices in order to promote sustainable behaviour. To sustain the sector at the pre-kitchen (procurement, storage, and supplier) and kitchen (cooking, serving) levels, better information and collaborative relationship management are required, along with an improved supply and demand alliance. For example, one participant in the focus group mentioned that the skin of yam tubers, discarded in the cooking of yam porridge which is a traditional dish among the entire Nigeria population, is a useful part of the vegetable in the processing and cooking of amala, a traditional

food in the western part of Nigeria. If the yan (skin) portion is made available to a larger pool of potential customers, it will not be discarded. A forum for the exchange of ideas and best practices could further assist and facilitate efforts and initiatives of these kinds.

6.5.3.2 Policy and regulations

The FS sector consists of businesses which are subject to policy and regulation. The sector needs attention from the government and public authorities. Although there is little attention paid to the sector in terms of public involvement in the regulation of its activities, this is required to ensure the better service delivery of food sustainability. In recent years, the attention of policy makers has been on oil and gas and the power sector, with this area of the economy being seen as more attractive than others. Since 1958, various rules and regulations have been enacted to guarantee that Nigeria's food supply is safe and healthy.

To ensure food safety, the Public Health Laws (1917), now known as the Public Health Ordinance Cap 165 of 1958, and the Counterfeit and Fake Drugs and Unwholesome Processed Food Act No. 25 of 1999 (now Counterfeit and Fake Drugs and Unwholesome Processed Food (Miscellaneous Provisions) Act Cap C34 LFN, 2004 (Omojokun, 2013, Ijaiye and Joseph, 2014) have been enacted. The National Agency for Food and Drug Administration and Control (NAFDAC) and the Federal Ministry of Health (FMOH) are all involved in policy development and the implementation of food and management control in Nigeria. However, none of this previous and current legislation has been specifically promulgated to deliberately address the FS sector or FW management. Governments and other policy makers need to put actions and investments into the FSS by providing a regulatory framework and ensuring the sector's compliance with it.

According to the Food Smart Diagnostic Report for 2020, Nigeria may achieve its policy goals of enhancing food security and decreasing food imports by minimising food loss and waste at

all levels of the supply chain. Through the Sustainable Development Goals (SDG, 2019), the Nationally Determined Contribution under the Paris Climate Agreement (Khan et al., 2021), and the Malabo Declaration (Union, 2014), Nigeria has committed to reducing global and regional food loss and waste. The country has expressly committed to the attainment of SDG12.3, which seeks to decrease food losses along production and supply chains, including post-harvest losses, by half by 2030. The FSS should be regulated as a framework for the sector's management and performance.

6.5.3.3 Consumer education

Consumers play a major role in the reduction of FW, starting from the point of dialogue with firms. Consumers are more likely to become active in FW prevention (UNEP, 2014). For example, interview participants suggested adding more information to menus about the size of the different items, and describing how a dish is served. It was also suggested to provide different portion sizes to facilitate a more personal choice of size. Consumer education has played a major role in other domains and clearly demonstrates its impact by interlinking with other stakeholders through a collaborative engagement by carrying out certain actions to reduce food waste. Consumers could, for example, self-report waste (Visschers et al., 2016).

A survey of US consumers suggests that those with Asian ancestry express higher levels of FW guilt than other customers. The practice of self-reporting should be encouraged to provide a basis for behavioural change for all stakeholders involved in the practice of waste generation. Previous studies on predictors of FW have not focused specifically on consumer or food education (Borgne et al., 2021), instead placing an emphasis on waste information provision. However, education on the magnitude and impact of FW is required to eliminate the need to report on it. Furthermore, establishing a sustainable consumption habit is required for the management of FW; this is a practice which should be included in a consumer's everyday

routine as a stakeholder. Consumers' understanding of their roles in eating healthily and being able to eat more fruit, vegetables, and other plant-based meals, as well as choosing local seasonal food, would reduce demand for specific regular meals that are frequently wasted.

"One of the challenges in our stores is that customers eat more rice, eba, amala, and other local foods, leaving other fruit and vegetables to go to waste despite having paid for them. I believe that the point is that our people do not eat healthily, preferring fatty foods". (Canteen staff, male, aged 48)

Some participants in the focus group stated that, although all of these initiatives are worthwhile, there remains a significant need for action.

According to the AMAC manager, all stakeholders should seek to use their existing understanding of how to influence consumer behaviour and improve on the 'Winning on Reducing' FW initiative.

Although the research on consumer motives and successful interventions is inadequate, it provides a foundation for a range of techniques to bring about the widespread changes in consumer behaviour necessary to drastically reduce food waste. The section of this research study regarding other stakeholders' collaboration to the minimization of FW explains how the company works with outside stakeholders to identify different means of reducing food waste.

6.6 Multi-stakeholders' group capabilities and impact on addressing FW

The interviewees mentioned the stakeholders associated with their individual food services firms; these include customers, suppliers, local authority staff, and community members, those who conduct research on the sector, firms' employees, managers, and owners. This research outcome shows that respondents understand who the stakeholders of their organisations are. Six of the respondents explained that they were aware of some of the relevant groups and

individuals, although they are unaware of their roles in food service (local food vendor customer, *transport catering supplier to schools*, academic research organisation, local community resident of District 2 canteen staff, and local community resident of District 1). The view of these respondents was that their presence within the sector in terms of minimising FW has not been noticed, therefore they assumed their unavailability within the sector. However, they agreed that stakeholders exist, and they comprise various groups.

Capability is the ability to do something; in this case, Garki food service stakeholders are able to manage the FS sector within Garki districts. The majority of interviewees believe that foodservice stakeholders have the capability to manage the sector and provide the efficiency which could help to reduce food waste. The interaction with and between the interviewees and the level of their understanding of the sector illustrates their level of their expertise; the question of their ability to manage the sector is not in doubt. The interviewees believe that, because most of the stakeholders have managed their businesses, this has provided them with experience coupled with academic achievement, thus there is no reason not to believe in their capabilities. Firms have a significant stake in the nation's economy in terms of their contribution to national GDP, infrastructure, and the human and physical resources at their disposal. The sector has associations with stakeholders such as the Association of Hotels and Restaurants, among others. Their customer bases attest to the existence of demand and supply in the sector. One interviewee said:

> "The owner of the firm where I work is a master's degree holder in food and nutrition from one of the foreign universities. We have well-read graduates here, but.... what? (researcher) they are not taken seriously". (Restaurant manager, female aged 40).

This interviewee had more to say, although despite encouragement to speak more, he declined to go further. *(*See observation report for details)

> "We have many graduates who are well-trained in various field and could apply their expertise to the management of the food service sector, although the attitudes of management do not show a willingness to tap into these employees' ideas because they are simply directed, controlled, and paid wages at the end of the month". (Canteen staff, male aged 48).

Interviewees believed that the foodservice sector is rich in terms of human resources, representing people with expertise from different fields of commerce to manage the sector and its activities, although they have been under-utilised by the owners and managers of foodservices. Some of the interviewees mentioned that this group of capable employees are willing to make their contributions based on their understanding of management, food nutrition, accounting, marketing, entrepreneurship development, sociology and other aspects of studies if given the opportunity to do so, rather than only allowing them to operate as an employee. They believed that the need to develop a relationship among all stakeholders would provide the necessary opportunities to offer their opinions, based on experience and knowledge.

The interviewee and the majority of the 27 respondents, representing 85% of the total interviewees, believed that very little impact has been made in the FS sector to reduce FW, although they identified areas of FW in which improvements have been made. Six of the interviewees, representing 15%, thought that some significant achievement has been made. The majority of the respondents strongly expressed the view that the amount of FW in each of the different food services is growing, and the population still seek to buy food from sources which

record a high level of food waste. One of the interviewees who was actively engaged in kitchen activities said:

> "I have no evidence of the impact these stakeholders have made on the FW situation. Primarily, the management of the firm I work for has not made an improved impact on FW reduction due to their role. Therefore, larger stakeholder groups have similarly not tried". (College canteen senior chef, male aged 50)

The interviewee believed that, because improvement had not been made in their own immediate firm, it is likely that no significant impact would have been made in the FS sector to reduce food waste. However, other stakeholders in the study held slightly different opinions, such as:

> "My manager is making an effort to organise workshops and meetings on the best ways to manage the kitchen so that we can maintain the recent progress made to the reduction of FW. The communities have continued to engage with our mangers on the amount of FW generated daily and how this has affected the environment; a lot of effort has now been made in this regard, but not much improvement has been seen". (Restaurant chef, male aged 47).

The interviewees' opinions show that there has been a recent commitment to the reduction of FW, although little has been achieved. Table 6.7 illustrates multi-stakeholders' practice role categorisation in relation to the reduction of FW.

Table 6.7 Multi-stakeholders' practice role categorisation in relation to reduction of FW

Category	Stakeholders
Calling for regulations	The public, the food service host community, researchers' public organisations, school proprietors, and NGOs are the main stakeholders who have called for policies and regulations to reduce the growth of FW in the FCT Abuja, where Garki district is located, to address the environmental and societal challenges of FW pollution.
Making rules	The stakeholders responsible for FW policy and the formulation of regulations are the FCT (an environmental protection agency), the municipal area council, NGOs, researchers within the universities, other governmental agencies, and public companies.
Compliance with legislation, regulations, and rules	For the compliance role, the FS sector in this case has a responsibility to comply as the main stakeholders generating FW are restaurants, local food vendors, caterers, and catering services.

Source: Author's own

The governmental departments responsible for policy formulation and the enactment of law in the Garki district area are the FCT (an environmental protection agency), the municipal area council, NGOs, researchers within universities, other governmental agencies, and public organisations. All stakeholders have a responsibility to play specific roles in the reduction of FW by advocating for the enactment of regulations and adhering to existing rules and regulations. In terms of the compliance role, in this case the food service sector has a responsibility to comply, as the main stakeholders generating food waste. Participants in the interviews and focus group discussion were of the view that their collective responsibility is required to achieve a much higher result.

6.7 Multi-stakeholders' practice to innovation for improved firm performance

Most of the interviewees believed that the FS sector requires a form of innovation which will help things to be done differently; within this context they did not think that the adoption of technology is required or should be a priority, but there should be a change in the process of carrying out work. Despite the understanding of the importance of innovation within the food service, few things have been done differently. All respondents believed that the way things have been handled, including serving, ordering, payment systems, and seating arrangements are some of the areas which require attention. The general service delivery system should reflect a more modern way of doing things, unlike its current format, in the opinion of the majority of interviewees. Some of the respondents complained about the impact of the lack of innovative practice:

> "Sometimes when a particular customer places an order, it is presented to a different person due to the wrong service delivery process". (Local food vendor customer, male aged 47).

> "Customers sometimes become angry left if the service is disorganised". (Hospital canteen manager, male aged 44).

This dissatisfaction is usually shown towards chef and those at the fron line of the restaurant business such as the cashier, supervisor. However, an innovative approach towards the management of FW is what is required to help minimise FW, in the opinions of the respondents. Furthermore, some of the interviewees showed a high level of interest in innovation within the FS sector, explaining that:

> "Yes, I definitely agree that innovation plays a key role in improving firms' performance such that it assists the company in the order-taking process, and

customers can see what is being ordered. Innovation also helps in the speedy response to service delivery, but it is lacking within the sector". (Hospital canteen manager, female aged 45).

(Researcher) "Sorry, what do you mean by service delivery?"

"For example, the way we attend to and serve customers matters a lot, and this has to change. Our business customers can place orders via a simple email, a mobile call, or other applications". (Mull restaurant manager, female aged 44).

6.7.1 Stakeholders' collaboration for improved foodservice sector performance (pre-kitchen, kitchen, and post-kitchen)

All the interviewees expressed the opinion that multiple stakeholders in the FS sector have the capacity to improve the sector at all levels of the supply chain, and especially at the operational stages of the food service. Evidentially, internal stakeholders (manager, owners, and staff) are making efforts to improve food service operations so that FW can be reduced. The structure of the internal stakeholders allows for frequent collaborations when they engage daily in the handling of food. This allows for constant review of their activities, their impacts, and proposed improvements over time. Some interviewees mentioned that:

"There is a need for external stakeholders like the government, suppliers, customers, and local community to interact and collaborate with the firm on areas of improvement which require attention". (Local community resident of District 1, female aged 42).

"There have been no formal approaches to engage with the firm as an internal stakeholder and suppliers, governmental and other external stakeholders about

the concerns of the sector, especially in terms of food waste". (Canteen customer, bank staff, male aged 49).

The majority of the interviewees believed that in the three operational stages of food service require multi stakeholders' attention, no specific or significant effort notable has been made by stakeholders at any of the levels of the food service where FW has been addressed, despite significant FW occurring throughout the entire food service sector.

The influence of the various stakeholders' roles on the handling of FW issues

> "Few roles of significance have been played by the stakeholders. My understanding is that they are not aware of the scale of the implications of food waste. Stakeholders have the ability to do this, but do not show much interest in reducing food waste". (Mull restaurant manager, female aged 44).

Some of the stakeholders mentioned that they performed an oversight function when they were on shift to ensure that food handling is carried out professionally. Working with and among colleagues creates an environment in which everyone wants to perform their jobs appropriately because they are aware that they are under scrutiny. Understanding of the various roles from suppliers to storage, and kitchen to service of meals are key to the reduction of FW. All these activities are carried out by groups and individual stakeholders, therefore their attitudes and approaches to completing activities determines how FW is managed. Two of the interviewees elaborated that:

> "Some of the stakeholders do not have the skills to perform their function". (Local food vendor owner, male aged 41). "They will function better if provided with the necessary support to do so". (Local food vendor customer, male aged 47).

These respondents believed that stakeholders could influence the sector positively, when the necessary skills and expertise are identified.

6.7.2 Stakeholders' involvement and collaboration

The essence of stakeholders building a relationship within and outside the firm is to help to improve service delivery through the various relationships amongst the various stakeholders. The expected result of stakeholders' involvement within the firms' relationship is the collective improvement of the foodservice sector's performance; this can be derived through communication and the exchange of information on FW management within the sector anywhere and at any time. However, within the study context of Garki districts, these events appear different because most interviewees believed that the roles of stakeholders were less noticeable and had not played any significant role in the reduction of food waste. An interviewee who is a supervisor in one of the restaurants around the districts explained that:

> "The role of the stakeholders in this organisation has not been positive. We hope the management and other relevant agencies will wake up to their responsibilities and address this issue of food waste". (College canteen senior chef, male aged 50).

Moreover, the majority of the stakeholders were at management level and were therefore able to decide on implementation; however, due to lack of interactions, involvement, and collaboration, especially from external stakeholders, FW persists via a variety of routes.

> "I have not seen any significant efforts made. However, some of our meetings at middle management level have suggested a need to provide a scheme which looks at the future of staff in the workplace and other bonuses and incentives to keep them motivated and encourages them to see themselves as shareholders".

(Hospital canteen manager and transport catering supplier to schools, male aged 44 & fame aged 54).

6.8 Emerging opportunities and practical policy initiatives for Garki's food service sector

This section provides an understanding of the opportunities which are evident and policy initiatives of importance to the Garki food service sector from the study's empirical findings. It details how food service practices are carried out by multiple stakeholders, and how these differ from those of a single stakeholder.

Within the context of Garki, FS stakeholders lack the understanding of the value co-created in multi-stakeholder practices, and how these practices could help to mitigate food waste. Therefore, it is rare for them to engage in any collaborative practices (Table 6.6). The findings show that having access to the three aspects of materials, competence, and meaning has provided stakeholders, both core and supportive, with all possible resource opportunities at their firm's disposal for the management of FW and strategic planning for food service sustainability.

The FS sector has continued to expand post-COVID-19 following the large movement of people around government agencies and Nigeria's federal capital Abuja to obtain new job contracts, new business deals and the expansion of mass transportation, which has necessitated the movement of people from all parts of the country.

By 2030, the global population will have continued to grow, creating a greater demand for food. The FS sector will also continue to innovate, with a greater differentiation of food service being required due to an ageing population and individualisation. This shift in demand necessitates the sector's adoption of novel technologies. The COVID-19 pandemic, which has challenged both global business and the social environment, has accelerated the need for the

adoption of more convenient, frictionless methods of order fulfilment and payment processing, although the convenience of these for both merchants and customers has ensured that this technology is here to stay, and the food service industry is not exempt from the global changes. Customers in Garki have started to demand to be able to order from the comfort of their own home, choosing any special offers at the click of a button, with the only points of contact being at delivery or collection. Compatible with all types of food service enterprises, smartphone ordering with table service are gaining popularity. Sustainable, collaborative behaviours would help to sustain the sector, expanding knowledge of the management of diverse aspects of food service.

The main argument for sustainable behaviour is the ethical practices which are required to manage food waste; these practices are applicable to all stakeholders, whether core or supporting. For example, businesses need to find ways of cutting costs for the benefit of the economy, the environment, and society, increasing their competitiveness and reducing waste. To achieve these aims, there must be sustainable utilisation of resources, energy, and infrastructure in order to provide an improved quality of human life (Mak et al., 2020).

As previously mentioned, Garki's food sector's future opportunities are linked to population growth, technological demands, and the improvement of sustainable behaviour (see Section 6.2). These opportunities provide access to better FW management with the aim of sustaining society, firms (firms, staff, and other stakeholders), and the environment in terms of water and land. This provides further cost savings, stakeholder satisfaction, increased revenue for firms, and availability of food for human consumption.

Figure 6.2 Emerging opportunities for Garki's food service e sector
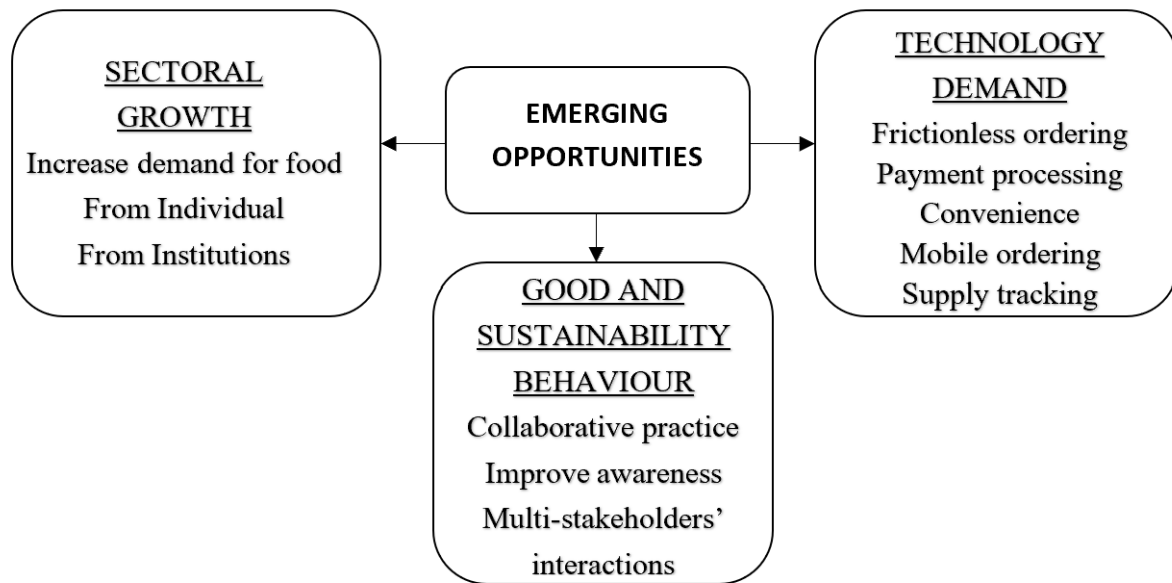
Source: Author's own

6.8.1 Sectoral growth

The foodservice industry accounts for more than 40% of the entire value of worldwide food sales (Gehlhar & Regmi, 2005). In future, it is expected that the value of worldwide foodservice sales will surpass the value of global retail food sales, according to Gehlhar and Regmi. This is due to customers' increasing demands for convenience. Meanwhile, consumers in developing nations also desire convenience; the rapidly-growing fast food industry reflects their increased desire for ease of transaction.

Because the food industry is neither uniformly defined across nations and regions, nor is food marketed consistently, it is challenging to determine the exact size of the global food market. In industrialised nations, for example, the foodservice industry accounts for a considerable and increasing proportion of overall food sales. However, food service encompasses a vast array of establishments, and it is typically difficult to collect good data across nations. In developing nations, and Nigeria in particular, a significant proportion of food is typically served from on-

street kiosks. This involves the sale of food made in vendors' homes and sold to consumers in a ready-to-eat state. As previously stated by (Bond et al., 2013) and (da Cunha, 2021), the industry has continued to expand significantly in developed nations, with growth potential in developing countries as a result of recent events.

The value of the global food service industry was estimated at USD$2,386.0 billion in 2020. Between 2021 and 2028, the market is expected to grow at a CAGR of 10.34%, from USD$2,525.4 billion in 2021 to USD$5,027.9 billion in 2028. However, the trend decreased by 31.46% in 2020 as a result of the COVID-19 pandemic and the nationwide lockdown. This trend has paved the way for new practices in the food service industry such as the online ordering of consumables and the rise in consumer expenditure on meals consumed outside the home throughout the world.

In recent years, innovation in the various sorts of services provided by restaurants, hotels, cafés, and eating establishments has steadily increased. Owners of restaurants and hotel chains, and individual entrepreneurs are expanding their services in all possible ways, facilitating online delivery services and responding to the trend of home delivery of food (Market Research Report, 2020). This has occurred in nations with high, moderate, and low levels of income.

To combat the issues posed by food service facility owners due to the COVID-19 pandemic, new and inventive business models are being adopted. Innovative marketing methods are being used to attract consumers back to the food service business, encouraging them to spend more in various ways. In addition, internet meal ordering systems support small and local companies in making their menus accessible online and expanding their customer base. These activities will also assist by bolstering the sector over this projected period, having faced formidable obstacles in 2020 as a result of the COVID-19 pandemic.

During the global 2020 COVID-19 pandemic, the food industry noticed the benefits of internet delivery because it facilitated customer access to ready-to-eat meals and allowed company owners to continue functioning in the face of difficult circumstances. The global spread of e-commerce systems has been driven by economic expansion, rising levels of disposable income, increasing food expenditure, and wider broadband adoption. As consumers' disposable incomes have risen, electronic payment methods have become more reliable; the number of providers and the size of their delivery networks has continued to develop, with consumers increasingly using online services. With the expansion of online delivery platforms, along with the use of these platforms by customers in developing nations, the relationship between consumers and providers has evolved, particularly during the COVID pandemic. Online ordering was already an established practice in many developed areas.

Nevertheless, in under-developed nations such as Nigeria this practice generally evolved after the COVID-19 pandemic, when eating establishments were closed. Due to the pandemic and lockdowns in developing nations, both large and small food businesses were impacted during and after the event. Due to the popularity of online meal ordering, delivery services have been viewed as the saviour for most food businesses throughout the pandemic. Since the COVID-19 pandemic period, internet-mediated ordering systems have been seen as an absolute necessity for the restaurant sector and other small businesses. Due to the increased need for lunches and dinners outside the home, foodservice and institutional catering services have grown due to socioeconomic shifts. Scientific and technical developments have also enabled caterers and mass food manufacturers to simplify their operations, become more efficient, and enhance food safety, while the use of computers has helped significantly. With rising migration, urbanisation, and globalisation, as well as exposure to multiple cuisines, the demand for a variety of food providers has expanded.

Advertisements for ethnic dishes and the increasing desire of local people to experience new meals at corporate offices, government offices, education facilities, entertainment centres, hospitals, and travel facility hubs have enhanced the demand for food of this nature. In response to the demand to serve institutional levels, new types of enterprises are emerging, such as those which deliver meals to the workplace and institutions which provide care for various target groups such as hospitals, nursing homes, orphanages, and hostels. Additional organisations which serve meals on a regular basis include schools, colleges, offices, jails, and governmental and non-profit food programmes designed to promote the health and nutrition of certain sections of the population.

In emerging nations such as Nigeria, institutional catering has become a key factor. Institutions of higher education, hospitals, and governmental offices are investing more in the provision of on-site catering for students, patients, and staff. Numerous opportunities exist for the delivery of high-quality, on-time food to these institutions due to their emphasis on providing high-quality meals. In addition to these organisations, various private firms serve meals to their employees as part of their welfare provision. Workers receive free lunch and supper at a significantly reduced cost, with the remainder of the expenses carried by the firm. The primary purpose of industrial, institutional, and welfare outlets is to supply a vital service. Because employee wellbeing is considered one of the most important factors when assessing a company's goodwill, market trends of this nature are growing at a faster rate than ever before, resulting in higher expenditure on food consumed outside the home.

6.8.2 Technological demands in food service

The era of digitalization which has dominated the western world has now started to penetrate developing countries like Nigeria following the COVID-19 pandemic experience, in which food sector businesses were unable to operate due to the lockdown. The experience has

prompted new world developments, although few food service operators have adopted new thinking and an appreciation of the technological world. Similarly, customers are abandoning traditional ordering methods in favour of online ordering because this is simple, error-free, fast, and transparent. The introduction of this trend is anticipated to significantly boost the food service industry in the coming years, based on the experience of other developed nations where this trend has proven beneficial and has created a variety of growth prospects for new market entrants.

Interactions with the service stakeholders show a level of unpreparedness; over 60% of this study's respondents and participants, both at the interview stage and in the focus group, were of the view that the sector is not prepared for the emergence and likely dominance of the digital technology within the food service market. However, the participants strongly believed that the sector will witness significant growth when the technology eventually arrives and is adopted within the sector.

The Nigerian government and private initiatives at all levels are working hard towards ensuring that the country's economy becomes knowledge based. The Minister of Communications and Digital Economy, which is the main driver of the agenda, has partnered with the International Finance Corporation (IFC), the World Bank group, and the EU in creating market, creating additional opportunities. The IFC's Country Manager Eme Essien in their Investee reports, suggests that the best way to think about Nigeria's digital economy is to reflect on its unrealized potential, adding that: Nigeria's ICT sector has grown significantly in the last few years, although it has not impacted the food service sector, but the country could play a much more substantial role in the global digital economy and that the opportunities we are seeing. Executives in the foodservice sector are debating how to adapt to digital disruption while

leveraging insights and data to guide these choices. Businesses won't succeed if they don't use at least some of these technologies.

6.8.3 Sustainable collaborative behaviour

The pandemic has compelled the FS industry to re-evaluate its business practices (Jones & Comfort, 2020). This rethinking should focus on the development of creative business models backed by circularity principles, along with multi-stakeholder and corporate collaboration (Filimonau, 2021). Multi-stakeholder and business collaboration for sustainability are unusual in the foodservice industry, despite the fact that customers and foodservice suppliers together produce information and value (Casais et al., 2020). This cooperation consists of in-person or online information exchange and feedback provision. This may relate to sustainability, although the focus is on the improvement of food services (Gopalan & Narayan, 2010). Regarding sustainability, foodservice operators are able to engage with non-profit, commercial, and research institutions. For example, in Garki there are few foods distribution stores which collaborate with NGOs. Although these practices are significant, this is a good starting point for the creation of awareness of the role of the charity sector in FW reduction.

The opportunities are enormous for the industry in Nigeria and Garki in particular, because the roles of both internal and external stakeholders are now developing. Both the public (non-commercial) and private (commercial) subsectors of the food services industry are already aware of the need to integrate into a technology-driven food services business with the aim of reducing FW (Winnow, 2021). There is obviously evidence of change in the perspectives of some restaurant partners, government agencies, academics, and the Abuja Chambers of Commerce, seeking to improve consumer engagement.

These partners, as important elements of the supply chain and sustainability enablers, need to involve additional and multiple stakeholders to collaborate on the use of the FW and strategies

in order to avoid waste. The Abuja Chambers of Commerce have a large network which can be co-opted for the further reuse of materials and the raising of public awareness of waste reduction. The relationship between foodservice operators and their suppliers may integrate elements of sustainability; for example, restaurants can collaborate with local farmers to gain access to seasonal produce and/or engage with distributors in order to acquire goods with specific environmental and health advantages (Brinkley, 2017). This study has observed the existence of collaboration amongst members of staff in Garki but is lacking in information from firms' internal senior management; companies' suppliers were the only active collaborators from the groups of external stakeholders. The need for multiple stakeholders' involvement to collaborate requires further enlargement of the significance although there appears to be a level of distrust and fear, which has limited success in this area.

Multiple factors account for the limited evidence of multi-stakeholder and business collaboration for sustainability in the context of foodservice. Firstly, the foodservice industry is extremely competitive, which opposes the concept of collaboration (Revell & Blackburn, 2007). This explains why foodservice providers tend to unite during disasters and crises, such as currently, when global warming has triggered a food crisis which threatens their immediate financial survival, demanding a joint response (Filimonau & de Coteau, 2020). Secondly, collaboration can decrease organisations' competitiveness; by developing and implementing FW reduction measures, a restaurant can decrease operational expenditure and increase profit margins (Pirani & Arafat, 2016).

> "Only when we all, as stakeholders, do things together on the understanding that we are all affected, will the sector progress; we have to talk together and inform ourselves of the challenges and possible solutions. Some would say we are

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competitors, but I believe that we also need to survive before we compete".
(Owner of a local food vendor, male aged 41).

By sharing this 'know how' with its competitors, this vendor risks suffering a commercial disadvantage (Polenske, 2004). This may explain in part why collaboration for sustainability is not regarded as realistic by food services, particularly private sector businesses (Filimonau & Sulyok, 2021). Given that non-commercial foodservices are primarily concerned with paying costs as opposed to earning a profit, this also underlines the strong potential for collaboration among them. Finally, the environmental sustainability agenda in foodservice remains in its infancy, and its intra-sector and cross-market acceptance varies substantially (Higgins-Desbiolles et al., 2019). Large chain-affiliated foodservices are better positioned than smaller independents to embrace FW reduction techniques (Filimonau et al., 2021). Small, independent food service providers, especially those in emerging and transitioning economies, do not place the management of FW at the top of their list of priorities.

6.9 Practical policy initiatives for Garki's food service sector

There is no approved framework on FW in Nigeria. In this case the FS sector and its stakeholders have continued to complain about the inability of the relevant agencies to come to their aid. To date, the majority of developing countries have not widely implemented a specific FW policy and the regulations for FW management are relatively incomplete in developing countries, like Nigeria. This research has identified several practices that have been recently adopted, along with an intense effort to limit the generation of FW. Stakeholders have doubled their efforts to reduce waste as a result of awareness of hunger and lost resources and profits for all stakeholders. Therefore awareness campaigns designed to attract the attention of all stakeholders to the impact of FW have increased in the media, particularly those developed by NGOs, although the campaigns are not tagged with a name using approaches similar to

those of other developed nations like the UK's 'love food, hate waste' campaign by WRAP. Other campaigns include Denmark's 'Stop wasting food' campaign, Japan's 'No food loss for consumption 2013', and the USA's 'Let's talk trash food' or 'Too good to waste food' (Bhattacharya et al., 2021). These campaigns have started to yield results for the sector as increased awareness has clearly been achieved.

A participant in the restaurant said:

"Even on the major roads around the town, there are posters encouraging consumers not to waste food". (Local community member from district 2, female aged 41).

FW campaigning is focused on providing sufficient information as to the general public on the growing implications of food waste. The Garki FS sector needs to develop a wide-ranging campaign strategy in order to reach both the sector and wider society through increased awareness of the need to reduce FW as a result of the information provided on the impact and challenges it poses.

To achieve the United Nations' Sustainable Development Goals (SDG 12), particularly that of halving per-capita FW at consumer level by 2030, a diverse strategy and mixture of interventions are required. Despite the growing focus on FW at policy level, current approaches are primarily concerned with raising awareness and disseminating information in order to redress knowledge deficits, change attitudes, and remove individual obstacles (Evans et al., 2012 a, b). There is, however, a lack of a clear and comprehensive policy framework which prompts appropriate action beyond the level of individual enterprises, empowering various players along the supply chain. In the next part of this study a series of policy measures are discussed, identifying potential actions for Garki's food service industry which might aid in reducing food waste; the suggested five policy initiatives are illustrated below (Figure 6.3).

Figure 6.3 Five policy initiatives for Garki
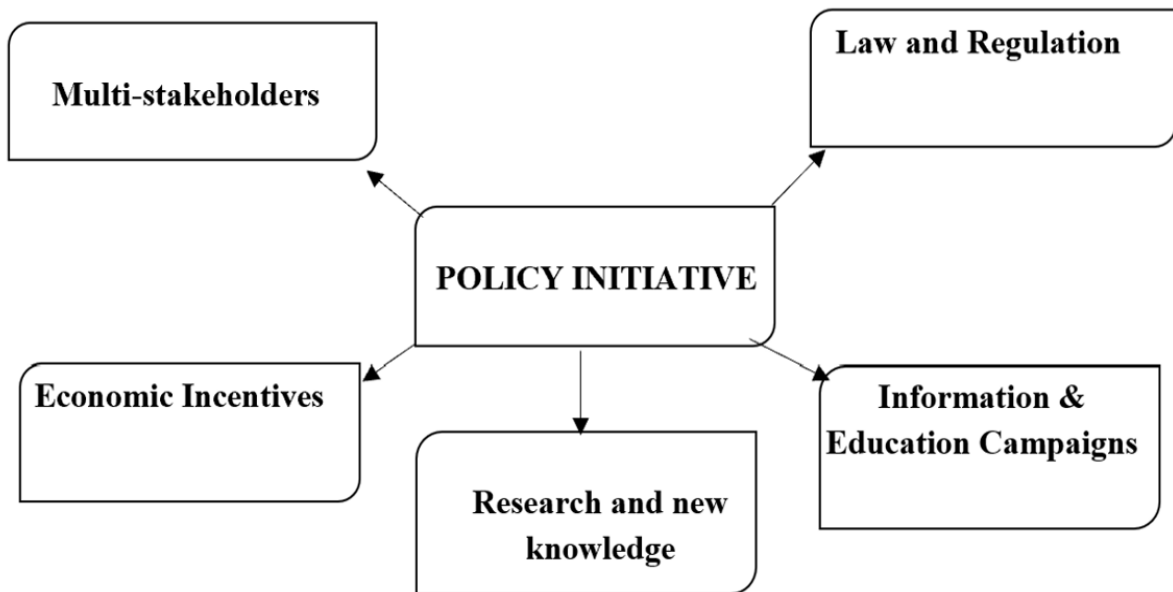
Source: Author's own

6.9.1 Law and regulations

The government is primarily responsible for setting the agenda and priorities of environmental interventions. As a result, national governments should prioritise the development of rules and infrastructure to reduce FW in businesses. Governments should set aggressive goals for the reduction of FW and provide innovation support to help farmers embrace sustainable agriculture methods. The study participants contended that that government should regulate the sector, especially the generation and reduction of FW, which is crucial for FW mitigation practices at policy level. Globally, practices within government and policy makers have initiated several approaches, formulating ideas for the reduction of FW from a policy perspective. As part of stakeholders' practice to recognise the need for FS sector growth, the regulation of organisational practices could be a more effective means of addressing these concerns in terms of day-to-day practice.

In countries such as China, France, Ireland and Europe, FW practices and control have received governmental intervention around regulations; for example, in France the food recycling laws passed in 2001, 2007, and 2015 have created a framework for FW management from a regulatory standpoint. Meanwhile in Europe, the landfill directive is used to regulate and control the generation of FW, which has resulted in the reduction of FW by 50% (Bhattacharya et al., 2021).

6.9.2 Multi-stakeholders' collaboration

Multi-stakeholder partnerships, sometimes referred to as public-private partnerships for development, cross-sector collaboration, or collective action, are a mechanism through which interested parties such as local charities, community groups, youth activists, and any other group including schools and local level agencies, can collaborate on specific challenges and/or exploit opportunities to achieve a greater impact than they could individually. Multi-stakeholder collaboration in food service involves organisations from different food outlets and external food service stakeholders such as governments, research institutes, customers, and suppliers working together, sharing risks and combining their respective resources and competencies in a way which generates and maximises the value of shared partnership and individual partner objectives, typically through innovative, sustainable, efficient, and/or systemic approaches. This collaboration centres on intra-stakeholders' engagement (within the sector-internal and external stakeholders) in developing policy regulations for effective performance, organising workshops and training as a means of continuous professional development to improve employees' performance in food handling and other aspects which have affected the appropriate use of ingredients and initiatives to reduce FW.

The firm itself would improve on its internal practices, expecting management to recognise the role and impact of their employees. Customers influence food waste as significant stakeholders,

revealing a new role for active citizenship in their food choices. Individuals' primary influence on the decrease of FW in food service is by changing what they choose to buy and eat; information provided can help to achieve this. Collaboration provides room for innovation which could drive down waste rates, although the current lack of joint working represents a disadvantage for the sector. Financial institutions such as the former People's Bank of Nigeria, now the Nigeria Agricultural Co-Operative and Rural Development Bank Ltd. in Garki, Nigeria, could provide support via a private partner initiative with the government's encouragement as its sole owner. Furthermore, financiers are often reluctant to credit small business owners, forcing them to rely strongly on traders for financing; this limits their ability to negotiate a reasonable price because they are established by the lenders, who also control market access.

6.9.3 Economic incentives

The food service requires a range of economic incentives, such as interest and tax rates, subsidies, minimum prices, and employee wage support, to encourage the efficient use of resources and the minimization of waste; these are necessary for sustainable development by means of costs or other market signals (Driesen, 2006; Fusions, 2016). It is hypothesised that, if the true cost of natural resource consumption were represented in pricing, customers would be more motivated to reduce FW (UNEP, 2014). A 'pay-as-you-throw' (PAYT) approach is a volume- or weight-based pricing system that has been introduced by various countries including the United States, Sweden, Canada, Japan, Taiwan, Korea, Thailand, Vietnam, and China (UNEP, 2014). In these countries, charging for refuse created by individuals has been shown to be a successful strategy for the reduction of FW (Chalak et al., 2016; Dahlen and Lagerkvist, 2010).

Currently, too little is known about the efficacy of taxes and levies, and how they could impact waste behaviour in Garki areas. The majority of the firms represented attributed some of their challenges to a lack of infrastructural amenities, thus they would incur debt and significant losses without government intervention. However, these policy initiatives would encourage best practice and sector management. All active players in the food sector believed that the private and public sectors (government agencies) have roles to play in the sector's sustainability; as economic hardship continues to decrease players' resources, there is a need for determined effort to provide economic support to the FS sector. An economic strategy which subsidises workplace canteens, as is prevalent in public offices and/or school meals, would encourage the consumption of the main meal outside of the home, relieving time pressure and reducing the pattern of over-purchasing of food (Evans, 2014).

6.9.4 Research and new knowledge

This study posits that research and records are vital policy initiatives required for FW management. The majority of the causes and management approaches to FW are identified and created by developed nations, and their implementation strategies are used with limited success. This study reveals three important points which raise the need for research and records as a policy for the food service sector:

1) Research and records indicate that little is studied and documented in Garki and in Nigeria regarding the mitigating strategies required for FW reduction.

2) A challenge is created by the fact that there is no record for researchers and practitioners to consult when seeking to come up with effective management actions and policies for the reduction of FW.

3) Academic and managerial lessons from fieldwork in food services and their contributions were absent from everyday conversations about the sector's problems and how to resolve them.

Research demonstrates that similar results were not previously identified in emerging countries (Corvellec, 2016; Garrone et al., 2014; Priefer et al., 2016; Thyberg & Tonjes, 2016).

There are research organisations in Nigeria which have the capacity to investigate food sector challenges and provide management recommendations to policymakers, although they have been made redundant due to a lack of staffing and funding to improve their operations. The Nigerian Institute of Food Science and Technology (NIFST), for example, is Nigeria's only recognised non-profit organisation; it represents food professionals from academia, business, government, and research organisations including the Centre for Food Technology and Research at Benue State University, the Institute of Agricultural Research and Training, and the Tertiary Education Trust Fund (TETFUND). A deliberate initiative is required to rebrand and re-establish a research culture to ensure the investigation of concerns which threaten food sustainability. The lack of these initiatives has led Nigerian researchers abroad, such as PhD or postdoctoral degree holders and others prepared to relocate.

The subject of FW has recently attracted the attention of academics in Brazil, where it is currently being incorporated into the study agendas of several of the country's institutions. These actions have stimulated debate with various stakeholders regarding FW reduction strategies. There is a need for project efforts which unite various stakeholders from the food industry to validate data, share ideas for developing new solutions for FW, and engage in open dialogue on a variety of FSS and FW-related topics. An important outcome of an event of this nature is the preparation of an agenda of multi-stakeholder activities which affect both food supply chains and food service.

A second critical consideration is to provide the Nigerian government with a feasible policy document to influence the execution of public policies designed to reduce FW. The initiative would also support the development of public-private partnerships, consider the role of multi-

stakeholders in supply chain governance, encourage better interaction with universities, develop new policies for improving food donation policies, support new technology platforms, raise consumer awareness of food which does not meet appearance standards, and implement campaigns to promote changes in consumers' purchasing tendencies, food handling, and consumption habits.

6.9.5 Information and education campaigns

Academics have postulated that consumers with high food awareness feel more confident that they are able to reduce FW (Borgne et al., 2021). In the context of restaurant FW, other studies have identified the fact that culture and education have a relationship with the attitudes and behaviours of actors toward FW (Sirieix et al., 2017). In the context of Garki district, FW has not been addressed from the perspective of information provision and the education of the individuals involved in the sector's day-to-day activities. Staff, for example, complained several times about the lack of motivation on the part of their employer and their unwillingness to work outside their job description, which is to provide food and attend to customers positively, rather than educating them on the need to buy what they can eat, using a takeaway bag rather than leaving food on their plates, and on their general attitudes towards food.

As mentioned earlier, prior research has shown that information and education for food service stakeholders could help to reduce the growing rate of food waste. Garki's food sector should strive to capture views and perceptions of FW and the need to educate the various stakeholders who are involved in the generation of waste. Academics such as Priefer et al. (2016) contend that information campaigns represent one of the most widespread tools used for the prevention and reduction of FW. This is also consistent with the viewpoints of the authors mentioned (Borgne et al., 2021; and Sirieix et al., 2017). In other western countries such as those in

Europe, people have learned the most about how to reduce FW through information and education campaigns, online information platforms, and door-to-door visits.

This education has been well implemented; for example, some of the campaigns which have been successful are Ireland's 'Stop FW Programme', Austria's 'Lebensmittel sind kostbar!', and Europe's 'Think, eat, save, reduce your foodprint'. One of the most successful campaigns has been the British 'Love food, hate waste' campaign. Nigeria has often raised concerns about air pollution due to inappropriate food disposal through community and corporate social responsibility in the media, but without addressing the FW issue, which is the major cause of environmental pollution. A campaign against FW has helped to prevent 137,000 tonnes of FW since 2007 (WRAP, 2012a) across Europe and the United Kingdom; this is government-sponsored. This is one of the challenges for developing countries, in this case, Garki, in which both local and national governments have shown little interest in FW prevention.

Finally, behavioural change is needed; door-stepping campaigns featuring face-to-face contact with customers and other relevant stakeholders potentially lead to meaningful reduction of FW (Farrelly & Tucker, 2014; Rispo et al., 2015). To be effective, information initiatives should specifically address the identified knowledge gaps which drive wasteful practices. There is a need for food service professionals to educate consumers on the need to develop skills in food storage methods and cold chain solutions (WRAP, 2017). Internal stakeholders should offer information on the freshness and condition of food products (Farr-Wharton et al., 2014; Jorissen et al., 2015). Customers should be taught about the significance of food for human survival, as opposed to focusing solely on the visual appeal of a dish.

Education in food management is essential due to the use of date labelling (Newsome et al., 2014), paired with a strategy of promoting the acceptance of 'defective' food, as previously discussed. Schmidt (2016) argues in her intervention research that it is essential to personalise

information on waste prevention behaviours for respective target groups rather than providing generic lists of all potential actions. In terms of information channels, Qi and Roe (2016) and Tucker and Farrelly (2016) demonstrate that pamphlets, word-of-mouth, television programmes and films are particularly effective methods of disseminating information. In contrast, Principato et al. (2015) discovered a substantial correlation between reduced FW with both online and conventional newspaper information. Finally, there is a need for a continuous campaign and the development of strategies for interventions in the food services sector waste level in relation to societal, environmental, social, and economic benefits to the growing population and the need to conserve food for those who need it.

6.10 Chapter summary

This chapter has outlined stakeholders' perception of how FW is generated and possible approaches to its reduction from a multiple stakeholders' perspective. The study focuses on the stakeholders in the Garki districts of Abuja, examining their responses to a specific sub-theme designed to provide their world view of the FS sector's management of FW. The overall results indicate that a significant proportion of food is wasted, with stakeholders engaging in a rage of collaborations. However, responses from these multiple stakeholders shows that little is done within the FS sector to achieve reduction in levels of food waste.

These stakeholders are involved in a variety of initiatives and practices by selecting a variety of methodologies and means of identifying waste routes and mitigating solutions. The extent of participatory efforts in identifying and analysing various strategic indicators for FW management was analysed from the stakeholders' perspectives. Some foodservices and other groups of stakeholders are relatively disengaged; they perceive little value from stakeholders' efforts over time. FW challenges were evaluated, along with ideas for various strategies that may be used to address FW management challenges and enhance stakeholder interaction. This

chapter has provided an overview of these issues, followed by a discussion of how FW could

be decreased by use of a multi-stakeholder-practice approach.

Chapter 7 Conclusions and recommendations

This chapter examines the theoretical and methodological contributions of this research study, along with its practical and policy-level implications. The chapter begins with the study's executive summary, summarising its objectives, purpose, and justification. This overview includes discussion of the study's theoretical foundation, methodology, research findings, and analysis. This facilitates the production of a concise summary of the study, highlighting the reasons for conducting the investigation, and explaining the contributions produced by this research. The following part of the chapter analyses the study's theoretical contributions by explaining how the use of an alternative framework of stakeholder theory and practice theory helped in understanding the relevance of stakeholders' actions in food waste management in the food service sector. The chapter covers the study's methodological contribution by detailing how the focus group and observation as a technique combined with semi-structured interviews has helped to generate new theoretical insights on food waste issues in Garki food service outlets from the perspectives of the actors involved. The section which follows explores in-depth the study's implications for management and policy. The chapter concludes with an explanation of the study's limitations and suggestions for future research.

7.1 A review of the research process

This study's main objectives were to identify the main causes of food waste, its impacts, and mitigating strategies to reduce these in the food service sector of Garki district, Abuja, Nigeria through a combination of approaches. The study began with a review of recent literature in order to comprehend the research challenge and to identify the gaps in the previous relevant work. The literature review initially established the relevance of food waste, followed by an analysis of how it has impacted the environment, economy, and society and how research has progressed to consider the magnitude of waste generated. The study narrowed down the

discussion on food waste to that which occurs within the FS sector and specifically, to the context of Garki, Nigeria, in order to provide a better understanding of the stakeholders' practices towards food waste management in the context of Garki.

This is because food waste is not a uniform variable, and the conditions of its generation differ between levels; for example, food waste generation within the household and the experiences of those who participate in its management and generation also differ between regions, cultures, and communities, thus the study seeks to determine how their behaviour is influenced. The following section highlights the need to explore studies on food waste in Africa and how it has been considered in Nigeria from the perspectives of food service practitioners and policymakers, seeking to identify how it has been approached in past studies. Food service has emerged as a significant contributor to the Nigerian economy and as a significant sub-sector of the economy, exerting a direct impact on people who eat out of their homes due to the nature of the activities they engage with on a daily basis.

The study has particularly explored stakeholders' practices within food service organisations and how these have impacted on the sector's management in terms of food waste route identification and reduction. The next part of the study defines and explains what food waste is, and how it can be categorised as i) avoidable, ii) unavoidable, or iii) potentially avoidable refuse (Dhir et al., 2020). There is then discussion of food services as an economic sector. This review of FW management and prevalent practices in the FS sector has enabled the identification of research gaps in the existing literature, as well as the need to investigate Garki food waste issues in order to provide new theoretical insights and a comprehensive understanding of this under-studied but important emerging market segment.

A survey of the existing literature on FW management reveals that the various theoretical perspectives used to analyse FW management have not comprehensively addressed the way in

which a stakeholder-practice perspective can be used to minimise FW in the FS industry. Determining and adopting the theoretical perspective of stakeholder theory (Freeman, 1983) in conjunction with practice theory (Shove et al., 2012) to explore the research topic was supported by the theoretical gaps identified in the existing literature. The research has examined the theoretical framework of practice theory by presenting its definition and explicating its components. There are several arrangements of practice components; this study used the nomenclature provided by Shove et al. (2012) because this allowed for a basic description of the practices of Garki's food service stakeholders. Shove et al. (2012) describe the aspects of practices as material, competence, and significance. Furthermore, the study has revealed the growing significance and application of practice theory in various disciplines, such as investigating the context of ICT in everyday life, cooking traditions (Halkier, 2009), dishwashing (Martens, 2012), cycling (Spotswood et al., 2015), snack eating (Twine, 2015), and leisure (Hui, 2013), environmental behaviours (Ropke, 2009; Hargreaves, 2011), and health (Blue et al., 2011; Heidenstrm & Kvarnlof, 2018).

This study has linked the conceptual foundation of practice theory (Shove et al., 2012) with the theoretical viewpoint of Freeman (1983), to understand how the practices of stakeholders within the food sector i.e. employees, owners, managers, customers, suppliers, and charity organisations inform an understanding of the causes of food waste and approaches for its reduction. Food-related behaviours are consistently viewed as socially- and culturally formed features. The renewed focus on food waste from a theory of practice has supported the development of an understanding of how stakeholders carry out their activities, and how their practices have been continuously redefined in everyday practices (Poggio, 2006). Further, Freeman (1983)'s theory suggests that stakeholders influence a firm's service results, either negatively or constructively; many researchers use stakeholder theory to build an interpretation of companies and their activities in order to resolve market issues (Freeman, 1984; Freeman et

al., 2018). Byrd (2007) contends that the first step towards stakeholder engagement in the FSS sector is to recognise who the stakeholders, and that the co-creation of value amongst multiple stakeholders is more than a simple focus on shareholder value (Manning, 2015). Failure to recognise a single primary stakeholder group's interest renders the stakeholder engagement process subject to potential failure (Clarkson, 1995); the stakeholders' approach should be participatory (Nieto et al., 2015), even within the FS sector. This study has employed the conceptual framework of stakeholders'-practice theory in the light of this notion in order to firstly identify the stakeholders of Garki food service and further explicate how the performance of these stakeholders, combined with their practices, enables the identification and reduction of food waste routes in the Garki food service sector.

In order to address the research question, the theoretical framework helped to determine the study's research strategy. The study began with a discussion of the philosophical premises which served as the foundation for the conduct and analysis of the research. The study adopted the philosophical backdrop of critical realism in order to share an ontological and epistemological stance to comprehend the meanings behind the practices of stakeholders in the Garki FS sector. The study seeks to understand how FW is produced and methods for its reduction it in the study context, along with the meanings and lessons learned from these experiences. The study's epistemological position was also to adequately learn about stakeholder-practice approaches to FW reduction in Nigeria by comprehensively researching, analysing, and explaining the results. The interpretivist notion that the researcher engages with participants to enhance knowledge is similar to this study's epistemological position. The term 'interpretivism' describes the perspectives of researchers who are sceptical about the application of scientific methods to the study of the social world; these have been impacted by various philosophical traditions.

These traditions share the belief that the subject matter of the social sciences, i.e. people and institutions, are essentially different to those of the natural sciences. Consequently, researching the social world requires a specific research logic which considers individuals' uniqueness in contrast to the natural order (Bell & Bryman, 2007). The study's data was gathered via semi-structured interviews, focus groups, and observation, using the analytical lens of critical realism. The data collection technique included a detailed description of the Garki districts of Abuja, Nigeria, in which the research was conducted, along with the rationale for the particular selection of Garki districts for investigation. Participants in the study were players in the food service industry resident in the Garki neighbourhoods of Abuja. The participants of this research were selected using both purposive and snowball sampling techniques to ensure representativeness and a comprehensive, impartial knowledge of the topic. 32 stakeholders were interviewed, with 16 participating in the focus group discussion. After achieving data saturation, the interviewing procedure was concluded. The focus groups from the two selected districts further confirmed the content of the interview transcripts. The researcher was able to acquire consistent, supported information on the topic by establishing two focus groups with a similar combination of group participants (Barbour, 2007).

The data gathered via semi-structured interviews and focus group discussions were analysed using a thematic analysis approach in which the data were originally coded based on the existing literature and the three aspects of practice defined by Shove et al. (2012). The data were subsequently categorised and reclassified according to emerging codes and themes, then compared continuously across all interviews to identify important patterns or themes. The discovery was the result of an overall rigorous process of evaluation and consolidation of data in pursuit of dense interpretation of nine *main causes of food waste in Garki districts* (Chapter 5, Table 5.6), challenges in food waste management (Section 6.3), and mitigating approaches to food waste reduction (Sections 6.4 and 6.5). One central area of this study is to better

comprehend social reality through the eyes of actors who have lived through the realities being studied. To obtain the required information for which the study was planned, close contact between the investigator undertaking the research and the participants was required; specifically, the participants' basic assumptions needed to be revealed.

Shove et al. (2012) examine stakeholder and practice theory using the scholarly work of Freeman (1983). The findings of the study firstly explained how the role of multiple stakeholders and the three elements of practice of material, competence, and meaning interacted to form the specific outcome of firms and how the execution or performance of these practices enabled the food services industry to identify the causes of food waste and existing sectoral challenges. In order to demonstrate and present the findings, the study drew on the perspectives of key stakeholders; its findings enable the comprehension of how stakeholders and their practices lead food service establishments to create waste, and also the provision of solutions. The following part of the study reviewed the findings, contrasting them with existing literature to determine the similarities and differences between the works.

The report has described the emergence of new prospects and regulatory efforts for the Garki food service industry (Sections 6.8 and 6.9). Further, the research has considered the significance of policy initiatives in the food service as practices from policy makers such as the government, and how those initiatives could guard against food waste generation and contribute to the achievement of the United Nations development goal 12.3 and 12.5 of substantially reduce waste generation and half global per capital food waste by 2030. The conclusion of the study has addressed the theoretical, methodological, and practical implications of this research, also discussed its limitations and making recommendations for further study.

7.2 Contribution of the research

On the basis of its findings, this study makes contributions in four main areas: theoretical, methodological, practical and policy-level contributions (Table 7.1). Policymakers and managers have always relied on a variety of sources of evidence when making decisions about policy and the organisation of services (Mays, et al., 2005) in order to meet the evidence-based requirements for policy formulation. Academics hold that the benefits and quality of a research contribution are dependent on two factors: firstly, the degree to which a proposition challenges existing beliefs or norms through its originality and interest, and secondly the degree to which a suggestion enhances and advances understanding of existing core beliefs and norms (Corley & Gioia, 2011; Janiszewski et al., 2016).

In other words, the objective of a research contribution is to simultaneously advance and question existing knowledge. This study also contributes to the understanding and advancement of stakeholders and the application of theory by offering a novel and intriguing perspective which enables the reader to comprehend how food waste is generated and the necessary strategies for its reduction in the food service sector of the Garki districts. In addition, the insights provided by this study are valuable; they have the potential to inform management practice and policy formulation (Whetten, 1989). The identified contributions are derived from scrutiny of previous relevant research, interpretation of the data, and a critical review of completed relevant research.

Table 7.1 Summary of research contributions

Contributions	Description
Theoretical contributions	To adapt the theoretical perspective of stakeholder theory to the environment of a growing economy and emerging markets.
	To combine stakeholder theory with practice theory to examine food waste management.

	To link stakeholders with the three elements of practice theory (material, competence, and meaning) to specific food waste practice.
	The merge the key tenets of stakeholder theory with the theory of Shove et al. to examine how food waste occurs in food services due to stakeholders' everyday practices.
Methodological contributions	The use of qualitative methods, such as semi-structured interviews, observation, and focus groups, in the Abuja, Nigeria, neighbourhood of Garki.
	The use of visual methods such as photographic evidence enhance understanding of food waste in Garki's food services.
	To theorise and explain the concepts of stakeholder- (Freeman, 1983) and practice theory (Shove et al., 2012) through in-depth and focus group interviews.
Practical level contributions	To design an approach for multi-stakeholders' engagement, collaboration and interaction on challenges and possible solutions from single- and multiple firms' perspectives.
	To identify the gaps created by the lack of practical evidence on approaches adopted in FWM within the service sectors of emerging economies.
	To identify the relevance of internal and external stakeholders to the food services sector and the impact of their collaboration to the achievement of food sustainability.
	To design a possible means of reducing waste problems from the multi-stakeholder-practice approach.
Policy level contributions	To highlight the importance of stakeholders, both core and supportive, and their collaboration in FWM.
	To emphasise the significance of policy initiatives for the management of the food service sector and sustainability for waste reduction.
	To provide economic and regulatory support which is conducive to the development of sustainable environments for FS outlets by recommending funds to access infrastructural development in other to enhance growth.
	To increase awareness among stakeholders and the general public of the magnitude of FW and its impacts on the environment, the economy, and society.

Source: Author's own

7.2.1 Theoretical contributions

Primarily, the main theoretical contribution is in the introduction and definition of a new concept named multi-stakeholder practice theory, which lies in the distinct insights it provides from the practice perspective to focus on multi-stakeholders' role in food waste mitigation. To date, no study found among published research has introduced the concept of a multi-stakeholder practice approach. Therefore, the concept and its empirical definition are presented in this thesis for the first time. Essentially, the researcher contributes by developing new knowledge or new information. In the conclusion chapter, the contribution of the research to existing theoretical, methodological, practical, and policy knowledge is discussed.

This thesis acknowledged the academic debate around the management of food waste, which has generally employed the planned behaviour theory (PBT), the system-practice framework (Goonan et al., 2013), the network approach (Ghinoi et al., 2020), and practice theory (Halkier, Gerro, & Martens, 2011; Hennchen, 2019). Majority of these studies focus mainly on individuals' organisational practices or groups of stakeholders in the management of food waste. This study moved beyond the common focus of organisations executing actions and/or identifying their stakeholders to the collective practices of multiple stakeholders in addressing food waste concerns. This view expands on stakeholder and practice theory by integrating and introducing a new concept, "multi-stakeholder practice approach," to food waste management.

This research argues that a practise perspective is pertinent to studying FW because it enables a grasp of the dichotomies inherent in the personal and social practises of stakeholders and how social relationships can contribute to regressive mind-sets even if a stakeholder is averse to FW in his or her personal capacity (Connell, 1987; Hennchen 2019). This study moves beyond the conception of a firm doing a thing or identifying stakeholders who are part of a firm by taking a multi-stakeholder practise perspective to indicate how resulting practises impacting food

waste result from stakeholders' intricate ties. In this respect, the thesis contributes to existing debates published in the journal pertaining to multi-stakeholder collaboration (Bhattacharya & Fayezi, 2021), multi-stakeholder classification of the food supply chain (Richards et al., 2021), and multi-stakeholder initiatives to reduce food waste (Matzembacher et al., 2021) in an emerging country. These studies have been narrowly focused, with little emphasis on the activities of food service stakeholders. As a result, the multi-stakeholder practises proposed in this study extended beyond the identification of stakeholder classes and multiple stakeholder initiatives to multi-stakeholder practises within the firm.

In addition, the conceptualisation of social practice covers a detailed identification of dimensions with a set of sub-practice elements, i.e., materials (things, technology, and infrastructure), meaning (symbolic meaning, ideas, norms, value, ethics, and aspiration), and competence (knowledge, skills, and technique) (Pantza & Shove, 2010). These subsets of practice elements can be practiced in isolation or in combination. In comparison to previous studies on food waste management, this concept (practice) has been presented and applied in isolation to understand the phenomenon of food waste generation and strategies to reduce it, with limited success because global evidence on food waste has not seen significant reductions, with evidence of growing waste in developing countries. As a result, a new concept, a multi-stakeholder practise approach to food waste management, must be integrated or combined.

The theoretical significance of this study context is found in the use of a practice-based approach to understand the roles of stakeholders in an unfamiliar study context such as Nigeria. These theories have not been applied in any study or similar studies before within this context of Garki, Nigeria, to the best of the researcher's knowledge. As a result, applying these theories, both in isolation and in combination, within the FS sector to FW issues in Nigeria would constitute a theoretical contribution to the research. However, this study did not only consider

the use of the concepts of stakeholder and practice approach but went ahead to integrate both concepts to create a holistic understanding of the FS sector's waste management behaviour simply as a result of the uniqueness of the Nigerian FS market. This approach is to provide a lens through the eyes of the stakeholders to understand the significance of identifying their role and how practices are applied to the different streams of knowledge that are practicable in the development of the foodservice sector. Therefore, the use of a multi-stakeholder practice approach has helped identify the types of stakeholders and roles within the FS sector of Nigeria and the broader FS practices inherent therein.

Finally, this is the first study to conceptualise and apply a multi-stakeholder and practice approach in an empirical setting, namely food waste management and waste reduction in the food service sector. As such, the author contributes a new topic, new information, and a new contextual setting to enrich the existing body of knowledge on multiple stakeholders, practice approaches, waste management, and the food service sector.

Figure 7.1 The Research Model of the study
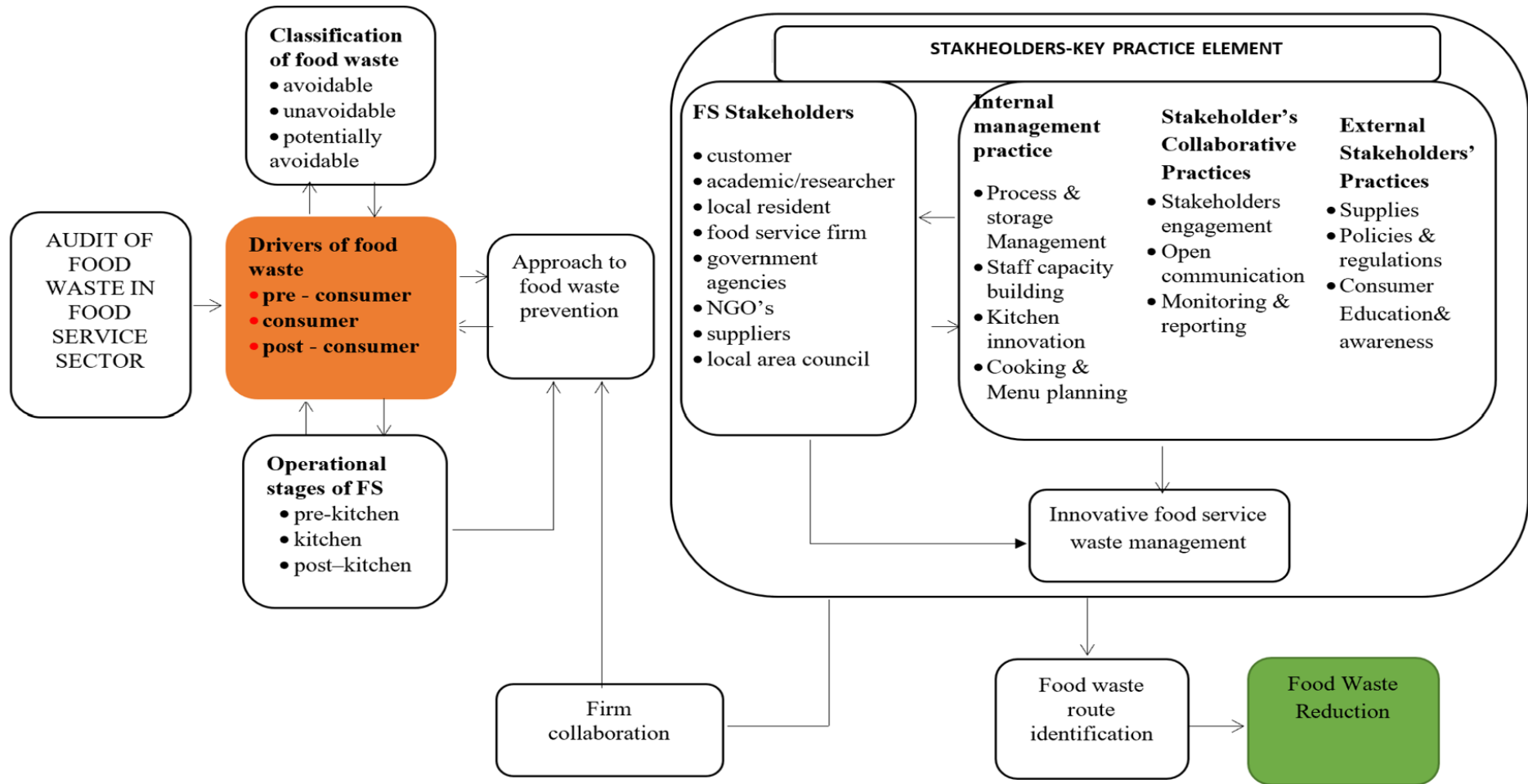
Source: Author's own

7.2.2 Methodological contribution

Secondly, this research contributes methodologically by the application of semi-structured interviews, the observation method and focus groups to examine the food waste practices of the food service sector of the Garki district, Abuja, Nigeria. According to the existing literature review, the majority of studies use quantitative approaches to investigate food waste issues in most domains (Drabik, Gorter, & Reynolds, 2019; Eriksson et al., 2020). Most studies which use the quantitative approach quantify food waste with little or no focus on how this is generated from the perspectives of the stakeholders' everyday actions.

This strategy fails to provide the necessary additional theoretical insights to comprehend the source of food waste and how it can be reduced from a broader perspective. However, qualitative methods provided in-depth knowledge about food waste route identification and reduction within the FSS, enabling meaning to be derived from stakeholders' practices, particularly from their expert professional opinions and worldviews. In this research, observation provided the researcher with a first-hand view of activities, which sparked their interest and added key, useful layers to the findings.

7.2.3 Practical implications

The contribution to research of this study should advance practical concepts, with theory informing practice and vice versa (Corley & Gioia, 2011). This paper also provides various managerial and practical ideas that may be used to gain advantage. These specifically emphasise the fact that foodservice stakeholders should design a model to apply a multi-stakeholder approach to their practices, where each individual can bring knowledge, value, and ideas to be shared among the various groups of organisational stakeholders; this will support the appropriate handling of foodservice operations. There is also a need for stakeholders to understand the significance of the different streams of knowledge which are practicable in the

development of the foodservice sector. This study also highlights the way in which firms can improve their performance and benefit from one another via various actors' understandings of their different roles, supporting themselves to achieve cohesion, mobilisation, and actions through dialogue, collective decision-making, and jointly implemented decisions.

Finally, this research also provides various policy-level implications. This suggests the relevance of critical stakeholders' groups' involvement in the FSS and at all stages of the firms' operations i.e. pre-kitchen, kitchen, and post-kitchen. The involvement of critical groups of stakeholders such as kitchen staff, chefs, and the community can bring economic, environmental, and social development to the sector (Papargyropoulou et al., 2016; Gao, 2021). It further highlights how strong policies can help Garki district food services to manage food waste systems and achieve food sector sustainability. This research provides a new way of considering and managing FW, devising sustainable suggestions for the Garki area and other similar contexts.

7.2.4 Policy recommendations and implications of this research

In 2016 the federal government of Nigeria introduced the National Home-Grown School Feeding Programme (NHGSFP) in Nigerian public primary schools in an effort to promote enrolment, reduce dropout rates, and assure quality learning results. Since its introduction in 2016, the implementation of the National Home-Grown School Feeding Programme (NHGSFP) in Nigeria's public elementary schools has been plagued by various execution issues; Taylor and Ogbogu (2016) assert that its implementation falls short of certain of the World Food Programme's stipulations in Nigeria due to a variety of obstacles. The country's ministry of humanitarian affairs has developed a policy to address food sustainability at local and grassroots level, which has been commended by some individuals and organisations.

The government has, in addition to these efforts, developed initiatives to support food production and transportation from rural areas of origin to urban areas where further value is created, processing is carried out, and there is ultimately high demand for consumption. In addition to the existing regulations listed in Table 5.3, the government is working to improve food safety practices by establishing a National Policy on Food Safety to integrate and harmonise all existing laws, standards, and codes which regulate food safety practices in Nigeria, redefining and coordinating existing food control infrastructures at various levels of government and eliminating areas of overlap and conflict. Despite the efforts made to strengthen the food industry, there remains a large management gap in the food waste and food service sectors. The findings of this study contribute to the advancement of critical policy recommendations which enable the establishment of sustainable food service policy.

Firstly, the importance of public education and awareness campaigns around food waste is highlighted. The majority of the population does not have a good understanding of the volume of food waste created and how this affects individuals, organisations, and government revenue. When food is wasted at the consumption stage the consumer is affected due to increased food prices, thereby affecting their pocket, while firms make losses and gradually disappear from the market space, meaning that the government can no longer collect taxes from them. Some stakeholders suggested that they knew little about the impacts of food waste and what role they need to play in its reduction.

Foodservice stakeholders are willing to work towards the sector's effective management, although know-how is important. Both private and public policymakers have a responsibility to collaborate and develop information at agreed intervals, identifying the challenges and a road map for the food sector. This could be facilitated by the establishment of a body or the strengthening of existing public and private institutions to draw the attention of the public the

magnitude of food waste on a regular basis. For example, the National Bureau of Statistics has responsibility for the collection and management of data, publishing that which is in the interests of the public in Nigeria, as part of their responsibility for the collection and analysis of data on food waste in the country. Where there is no information on the scale of waste generated, stakeholders are likely to look the other way while others go hungry. Therefore policymakers should collaborate in the development of a policy framework to campaign or educate firm owners, managers, customers, suppliers, and government agencies. This is likely to further reduce food waste, result in better waste management, and create better food service performance.

The second policy initiative is a suggestion from the study on the need for institutional development. This study has found that little is done by the government and the private sector to address challenges in the food service sector, either for the environment, business, or society, and this is a key area which requires protection for food sustainability. The reasons for the growing challenges of waste and the lack of direction on how to mitigate reduce are largely due to the sector's inability to organise itself to collectively address this acknowledged problem. Therefore, the government needs to devolve or develop measures to organise the sector in such a way that there is a specific institution to regulate it, unlike the current situation in which various governmental agencies are saddled with additional responsibilities for general waste management such as the National Agency for Food and Drug Administration and Control (NAFDAC), which regulates and controls the production, import, export, advertising, distribution, sale, and usage of food; the Abuja Environmental Protection Board (AEPB) and the Federal Environmental Protection Agency are statutorily tasked with the protection and management of the FCT environment in which Garki is located.

This protection is designed to ensure that the environment is not littered with food waste, that hazardous substances which could emanate from FW and disposed of appropriately, and hotels, restaurants, and caterers (HORECA) associations who have organised themselves informally as voluntary associations, have the power to sanction. Thus, the federal government should strengthen its monitoring and evaluation systems of the food service sector (Jacob & Musa, 2021), implementing a strong policy towards organisation for the better coordination and reporting of activity within the sector. This would help the Garki district food services to achieve growth, continuing to sustain jobs, families, and the community.

Finally, financial support from the government and private sector organisations, such as financial institutions, would enable growth within the sector. The food sector has not seen significant expansion and growth compared to its counterparts in developed society, despite the level of demand in the sector in terms of service delivery and patronage. Some of the areas which require financial support or incentives are technological infrastructural adoption and implementation, which is capital-intensive, and a more attractive and cleaner environment, which is determined by the structures introduced.

Table 7.2: Summary of policy recommendations and implications of the research

Education and awareness campaigns	Understanding of the volume and impact of food waste is lacking. There should be more private and public (governmental) efforts to find out how much food is wasted and what effects this has.
	Stakeholders in the food service sector should be trained in reporting, and collaboration, gathering and disseminating information on food waste.
	There is a need for core and supporting stakeholders to interact regularly on the basis of a developed framework, to campaign and educate themselves.
Institutional development	Institutions relevant to food service management should be obliged to discharge their responsibilities, including in terms of data reporting, such as the National Bureau of Statistics.

	There should be a government policy or legislative direction which is well-known to the public on the implications of wasting food, resulting in disposal (fines), and the benefits of food waste reduction, environmental protection, and excess food distribution which would attract tax relief and funding support.
	Institutions which perform food service sector oversight with multiple responsibilities such as the NAFDAC and AEPB should be relieved of these, and a commission or government agency should be established to specifically supervise the sector. This initiative would increase the sector's efficiency, effectiveness, and sustainability.
Financial support	Due to a lack of policy initiatives to support the growth of the food services industry, these firms have continued to struggle, experiencing limited growth despite their contribution to the economy. The government should create an environment which renders it easy for businesses to obtain loans and other forms of credit to help them grow and expand.
	The food services sector has contributed to the Nigerian economy, helping to reduce unemployment and criminality by engaging with the youth population. During the COVID-19 pandemic this sector lost value due to business closures in adherence with social distancing rules. The sector is yet to witness expected growth, even in the post-COVID-19 era. Financial support would enable firms to rebuild, continue trading, and retain employees.
	Small-sized food service businesses such as local vendors have witnessed strong competition from well-established restaurants and catering services due to the lack of access to their own delivery vehicles, better staff capacity and funds to provide training, and physical and technological structures for better service delivery. Policymakers should provide access to finance to enable these businesses to achieve their aims.

Source: Author's own

The majority of employees in the sector are not well-trained; they are therefore reluctant to use of their initiative to develop their activities. Current market structure places a high demand on small restaurants and other food services in which customers seek convenience, and the delivery of food has become competitive has customers see this as a motivating factor to decide on where to buy from when considering convenience. Food businesses now aspire to have their

own delivery vehicles, improve staff capacity, and provide training, improving their physical and technological structures for better service delivery.

In 2020, due to the impact of the COVID-19 pandemic on the ecosystem, Nigeria's food service business turnover declined by 16%. Due to the pandemic, consumers' fear of contracting the virus, and their conscious efforts to restrict discretionary expenditure exerted a significant detrimental impact on the food service industry (Boluwade, 2022). According to a report by the National Bureau of Statistics, accommodation and food services contracted by 17.75% in 2020, down from 2.85% in 2019 and 1.76% in 2018. For the entire year 2020, it contributed -4.13% to GDP. The sector contributes significantly to the economy by paying taxes and reducing the unemployment rate, hence the need for targeted funding in terms of loans and tax relief for a period of time to decrease the financial burden created by the COVID-19 pandemic, facilitating expansion and stability.

In conclusion, the food service industry contributes significantly to national growth and the attainment of the United Nations' Sustainable Development Goals. Target 12.3 of the latter aims to reduce global food waste at retail and consumer levels and along the value chain by 50% by 2030. In addition to these goals, the Committee of World Food Security has urged all public, private, and civil society actors to promote a common understanding of food loss and waste and to create an enabling environment for its 'food use-not-waste' agenda, particularly with regard to monitoring, measurement, and reporting objectives (Schuster & Torero, 2016). A deliberate public policy initiative would support the food service industry in addressing these issues.

According to the Nigerian Association of Fast-Food Confectioners (AFFCON), Both private and public organisations and authorities need to pay attention to its challenges, growth, and opportunities. In Garki, Nigeria, the continued existence of the sector is dependent on the

amount of attention and support that is provided in terms of stakeholders' collaborations, involving firms' owners, managers, customers, suppliers, government agencies, NGOs, local communities, academic researchers and organisations, to provide information, create campaign awareness, develop an organised policy framework, and support the sector with financial incentives.

7.3 Application of research findings to another context

The findings of this study fill a critical gap theoretically, empirically, and methodologically by adopting multiple approaches of interview, focus group, observation, and the visual method in order to understand FW management practices, how waste occurs, and ways to reduce it in the FS sector of an emerging economy such as Garki, Nigeria. The study identified challenges to FW mitigation and how a multi-stakeholder practise approach can help reduce the challenges posed to society, the economy, and the environment as a result of the FW generated within the food service sector. It further highlights the significance of developing deliberate policy initiatives for the sector as a standard of practice; this includes multi-stakeholder engagement, providing economic incentives, enacting laws and regulations, providing information and education to stakeholders regarding FSS, and developing research and providing new knowledge to curb FW generation and help in the mitigation process.

The findings of the study combining stakeholder and practise theory to FW management could theoretically be applied to other similar studies as well as interdisciplinary and intradisciplinary studies; for example, nursing and horticulture as a discipline have both used practise theory in a number of their studies. Therefore, this study lays the foundation for incorporating multiple-stakeholder theory into future work.

This study's empirical findings draw on evidence from an emerging country and the cosmopolitan city of Garki district, analysing a multi-stakeholder practise framework as an

integrated approach to FW reduction by providing a new layer of discovery of harmful FW within the FSS to food sustainability in an emerging economy nation like Nigeria. These findings can be applied to contexts where there is evidence of similar culture, close developmental stages in nation history, and a similar level of infrastructural challenges and issues with organisational and management philosophical practices such as management vs. employee relationships, which has provided a clear gap in the results of FW practices in developed and developing societies like Nigeria that this study identified.

Methodologically, understanding FW practices from the viewpoint of the sector stakeholders requires an in-depth, close view of the market activities through the eyes of the practitioners. To achieve the aim of the study, multiple approaches using a qualitative research instrument, i.e., interview, focus group, observation, and the visual method, were adopted, and the essence of the study was to understand the behaviours that led to FW generation and how these can be reduced from the viewpoint of these actors (multiple stakeholders) in Garki, Nigeria. This study's findings can be applied to other African nations. The methodological usefulness of this research is substantial because it captures the reality within the FS sector (e.g., restaurants, cafeterias, fast-food restaurants, take-out eating places, canteens, bars, and catering, such as supermarkets). Its conclusions and findings from the use of these research instruments can be applied to other FS domains and/or any other food supply chain where the research intent is to discover the reality of a phenomenon from the actors' point of view.

7.4 Limitations

The study's main aim was to identify the causes of food waste in Abuja's Garki district, to understand how it is generated, and to consider means of mitigating it. Despite the different theoretical views, practical and policy-level contributions were employed in this study to explore Garki's food service waste from a multiple stakeholders-practice approach, although

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this research has several drawbacks. These constraints also serve as recommendations and indicate the directions for future research.

Firstly, the study was conducted in the single urban Nigerian city of Garki because examining the causes of FW in an entire country like Nigeria may be misleading due to generalisation. The Garki district was selected for this research because it has attracted a wide variety of food service outlets as a result of the expansion of both private and public organisations within the city. In recent years, the district has also seen an influx of investment from real estate, boutique hotels, construction workers, educational institutions, and governmental and private facilities such as multinational organisations and banks which have provided new opportunities for different parts of society. Nonetheless, it is clear that conducting research in only one or two identical areas restricts the generalizability of the findings. Nigeria is a large and diverse nation with extensive geographical areas and more than 250 distinct ethnic and religious groups, languages, and customs, all of which culminate in distinct food service outputs. Therefore, it is important to perform comparative study on the causes of food waste in different Nigerian areas, states, and districts in order to identify similarities and differences in their workings.

Another constraint is that this investigation was restricted to food services in the Garki districts of Abuja. Relevant stakeholders' studies in this study area are likely to differ from other regions. The conduct of practices is contingent on the linkage of certain elements, which may vary by practitioner, place, and occasion (Warde, 2005; Shove et al., 2012). In other words, the development of three parts of practice and their interconnections may vary depending on the stakeholders' socioeconomic backgrounds. The current research has specifically examined food services operating in the capital city of Nigeria without considering alternative smaller urban or/and rural areas in which food services also experience FW and are affected by the government's causes and policies.

Moreover, this study has particularly focused on the major food service outlets through the lens of experienced stakeholders who exert an influence on services without consideration of samples of lower- or middle-class employees and/or external stakeholders who carry out day-to-day activities. The main reason was to render the study more focused on input from the sector's management and policymakers. The reason is that managers, owners, and senior members of internal stakeholders' organisations and senior members of external agencies, such as NGOs, government agencies, and research bodies, engage at a higher level of impact, and have expert knowledge of the sector.

This study has made particular use of semi-structured interviews, focus group discussions, and observation methods to study stakeholders' activities and how they result in food waste, considering ways in which a multi-stakeholder practice approach could help to improve the sector. Although this methodology has provided valuable insights into the challenges of food waste management practices in the food services sector and how these practices are supporting the development of mitigating strategies, this study remains limited to a defined time period. The research does not assess whether the proposed mitigating approaches identified have the capacity to sustain the sector.

7.5 Future research directions

In addition to identifying and proposing new ways and notable dimensions for future research that may be studied to produce new theoretical and practical insights, the findings and limitations of this study help to identify and propose new approaches and dimensions. As previously stated, the current study provides an account of the multi-stakeholder perspectives on food waste management practices in the food service industry in one location, and there is a lack of research on Nigeria's general food waste management challenges. Therefore, more study should be undertaken in different regions of Nigeria, particularly in rural areas, to

determine the parallels and differences between the research findings. Nigeria is a large and diverse nation in which regional languages, cultures, and customs differ among individuals. In addition, each geographical region or state has its unique growth, infrastructure, and socio-economic characteristics.

Therefore, it is important to examine the views of additional stakeholders and their food waste management practices in other locations of Nigerian cities. It would be helpful if similar theoretical and methodological research could be carried out in future on stakeholder staff at middle-or lower-levels such as cleaners, waiters, and storekeepers to find out whether they employ similar waste-reduction practices and how these affect the sustainability of their firms. Related theoretical and methodological contexts can also be used to consider the emerging food waste reduction practices of multiple stakeholders in other African and developing countries outside the continent. It would be particularly useful to investigate how these middle or lower-level staff use food waste reduction practices to improve firms' overall FW management practices in different contexts.

Secondly, because the multi-stakeholders' practice approach is an important management strategy for the reduction of food service waste in Garki, a separate study focusing on middle and/or lower-level staff would prove beneficial in understanding how these staff collaborate and engage as organisational stakeholders to reduce waste. Future studies could likewise provide a comprehensive understanding of the views of these middle or lower-level staff on the various challenges facing the food service sector, including waste generation and possible mitigation strategies. It would also be interesting to identify the similarities and differences in the views of managers and employees of the Garki food service sector practices towards waste prevention practices; this might offer intriguing new facts and outcomes to the previous study findings.

Thirdly, although the exploration of the views of the participants through semi-structured and focus group interviews has provided a glimpse of the sector's stakeholders' activities, approaches, and understanding of FW management and possible mitigating strategies for its reduction, further studies can be conducted to understand the extent of involvement of both internal and external stakeholders in the food service sector with a view to ascertaining the dimension of their current engagement in the addressing of FW challenges.

Fourthly, this study has discussed the lack of involvement of middle or lower-level staff in the discussion and management of food waste in the Garki district of Abuja; there is no evidence of the extent to which they have contributed to the generation of waste or their roles in food waste mitigation. It is important to conduct future research enquiries to examine how the lack of involvement of middle or lower-level staff stakeholders has affected the economy, society, and environment. The achievement of the UN goal of halving food waste by 2030 requires the involvement of stakeholders at all levels, because waste occurs via various routes. Therefore, it is imperative to understand the relationship between the middle or lower-level staff of food service outlets to waste management.

Fifthly, future research could provide significant insights by applying case study ethnographic research methodologies to examine the evolution of Garki food outlets' food waste management practices over a longer period of time. Additionally, it would help in understanding whether middle- and lower-level staff have a role to play in providing sustainable food waste management practices in food services to improve firms' socio-economic performance. Therefore, an ethnography of direct observation of stakeholders' firms in their natural environment should be ascertained and studied.

Sixthly, this thesis investigates waste management at the food service stage of the supply chain in Garki areas as a result of a production-waste imbalance. In this study, qualitative research

techniques including interviews and focus groups were used to investigate the fundamental causes of food waste in the Garki food service supply chain; accompanying multi-stakeholder best practices and mitigation strategies have been explored. Future research could use quantitative approaches such as surveys to determine the amount of refuse created by each underlying cause. Future study should focus on additional locations with important food service shops, such as the western territory of Nigeria including Lagos and Ibadan, which have a substantial population and numerous food service operators.

Seventh, it is clear from the present research results that Garki stakeholders take an interest in various activities such as cooking, menu planning, serving, communicating, providing online food ordering services, and using technology platforms. These findings suggest that the challenge within the sector is encouraging stakeholders to consider alternative approaches to the management of food waste and therefore to adopt new practices of engagement and collaboration. This significant result necessitates more investigation to investigate how new opportunities are likely to manifest. For Garki food services, such as sectoral development in food demand from individuals and institutions, the demand for the use of technology within the sector, and improvements to sustainable behaviour could lead to management efficiencies and the reduction of waste. This could help those who have a stake in the matter to devise new means of dealing with the issue of food waste.

Finally, this thesis discusses multi-stakeholders as a connection from the perspectives of both influence and duty, focusing on multiple stakeholder-firm interactions. Researchers such as Rhenman (1968) use the term 'stakeholders' explicitly in organisational theory literature to describe the people or groups who are reliant on an organisation to achieve their own objectives, and on whom a company is reliant (Freeman, 1983). This description describes only the doings of a firm's actors without consideration of the role of gender in firms' practices and

actions from a gender-dominant perspective. The food service sector is male-dominated at management level and the majority of the views capture the male perspective. Therefore, there is a need to examine women's contributions to food waste management and explore the role of gender in food service sustainability through practices which will further provide understandings of how gender differentiation influences food waste outcomes.

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APPENDICES

Appendix: A

Participant information letter for

Critical evaluation of the impact of multi-stakeholders' practices on food waste management in the Garki districts of Abuja, Nigeria– a qualitative study

Researcher: Victor Oyewumi Ogunbiyi, PhD candidate, Faculty of Business, law and Politics, University of Hull, Cottingham Road, Hull, HU6 7RX

I am a PhD candidate at Hull University Business School, University of Hull. As part of the degree, I am undertaking a research project on the evaluation of stakeholder's role in managing food waste in Garki food service sector in Nigeria.

This research will aim to *evaluate how food waste is generated and approaches to reduce it from the different stakeholders' perspective within the context of foodservice sector in Garki districts area of Abuja, Nigeria*

The participants will be food service stakeholders such as the core and supportive stakeholders of food services, viz., firms (owners, managers, staff), suppliers, government agencies at both national and local level, NGOs, research organizations, academics, customers, and local residents. The participants will be asked about the attitudes, opinions, and point of views towards food waste management practices in Garki districts, Abuja, as well as how stakeholders interact. In addition, the participants will be asked about their experience, expertise, food handling practices. Moreover, the participants will be observed in their natural setting such as at the participants 'working place, at their meeting activities, and at their business routines. Thus, this might affect on their personal privacies. However, the participants will be informed and explained clearly about the research aim and processes before interview and observations, as well as ask for their consents for the research interview and participant observation.

The interviews will be recorded by note taking and tape recording. Participants 'activities will be observed and recorded through note taking, tape recording, and photo taking with the permission from participants.

Participants are assured of confidentiality. The results will be used for research purposes and may be reported in scientific and academic journals. Individual results will not be released to any person except at participants 'request and on participants 'authorisation. Participant is free to withdraw his/her consent at any time during the study and without adverse consequences, in which event his/her participation in the research study will immediately cease and any information obtained from him/her will not be used.

For further enquiries on this research project, please contact.

Researcher; Victor Oyewumi Ogunbiyi, University of Hull Cottingham Road, Hull, HU6 7RX

Email: v.o.ogunbiyi-2017@hull.ac.uk

Supervised by Professor Gunjan Saxena University of Hull Cottingham Road, Hull, HU6 7RX. Email: G.Saxena@hull.ac.uk

Appendix: B
Informed Consent form
(To be completed by researcher and signed by participants)

I, ………………………. of ……………………………….………. firm…………………
Hereby agree to participate in this study to be undertaken by **Victor Oyewumi Ogunbiyi**
(Researcher) and I understand that the aims and purpose of the research is to:

> *To evaluate how food waste is generated and approaches to reduce it from the different stakeholders' perspective within the context of foodservice sector in Garki districts area of Abuja.*

By signing this consent form you agreeing to your participation in this research process and to the collation of the material. Participants have the right to withdraw from participation in the research process at any point and materials collated from them up to that point will be removed.
I understand that.

1. My response in the interview will be coded and my name and address kept separately from it.
2. Any information that I provide will not be made public in any form that could reveal my identity to an outside party i.e. that I will remain fully anonymous.
3. Aggregated results will be used for research purposes and may be reported in scientific and academic journals (including online publications).
4. Individual results **will not** be released to any person except at my request and on my authorisation.
5. That I am free to withdraw my consent at any time during the study in which event my participation in the research study will immediately cease and any information obtained from me will not be used.

Participant's Signature: Date:

The contact details of the researcher are:
Victor Oyewumi Ogunbiyi
University of Hull
Cottingham Road, Hull, HU6 7RX.
Email: v.o.ogunbiyi-2017@hull.ac.uk

Supervised by: Professor Gunjan Saxena
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Appendix: C

Semi-structured question schedule / 1-1.30 hours

SEMI-STRUCTURED- IN-DEPTH INTERVIEW QUESTIONNAIRE

1. RESPONDENT'S PROFILE

- ✓ Tell me about yourself (e.g., What is your level of education?
- ✓ Please tell me how long you have worked at this company? in what capacity?
- ✓ What is your current position at……….? and what are your roles and responsibilities?

2. PROFILE OF BUSINESS

- ✓ What nature of foodservice sector are you? (Hotel, Restaurants, Cafeteria, Canteen, etc)
- ✓ Briefly describe your firm structure
- ✓ What is your experience in the foodservice sector?
- ✓ How many employees work within this company?
- ✓ What was the turnover in the year-end 2020?
- ✓ Who owns this firm?

3. EMPIRICAL STUDY- THEME

To empirically investigate how food waste is generated and approaches to reduce it from the different stakeholders' perspective within the context of foodservice sector Garki districts area of Abuja.

SUB-THEME 1: FOOD WASTE AND CAUSES AT GARKI DISTRICTS FOOD SERVICE SECTOR

1. How would you describe food waste?
2. Waste of food is not acceptable to human- do you agree with this statement? if yes-expatiate and if no reason for your response?
3. What are the causes of food waste? e.g., Overproduction,
4. What do you consider as the food waste hot spot? e.g., Processing, storage, behaviour etc
5. In your word, explain how waste occurs in your handling of food? including at the three operational levels (Pre-kitchen, Kitchen, and post-kitchen).
6. What do you think is the major cause of food waste in your firm?

SUB-THEME 2: IMPACT AND CHALLENGES OF FOOD WASTE

7. What in your opinion are the consequences of wasted food?
8. Which group of the stakeholders are affected by this consequence? and why.
9. What are the challenges faced by your firm to reducing food waste? And which of these is the greatest challenges faced.
10. How can these challenges be overcome by firm?

SUB-THEME 3: APPROACH TO REDUCE FOOD WASTE FOODSERVICE SECTOR

11. What effort is your firm making to reduce food waste?

12. Do you think your firm's effort is worthwhile? if yes, what are your reason for the response and if no, explain why?
13. As a…………….... what do you do onsite to reduce waste?
14. Can you suggest any other good approach to reduce food waste?
15. Who should get involved in reducing food waste?
SUB-THEME 4: DIFFERENT STAKEHOLDERS-PRACTICE APPROACH IN FOOD WASTE MANAGEMENT
16. Are you familiar with the group of stakeholders associated with your firm? If yes, who are they? do you think they have impact?
17. Do you think firm stakeholders has the required capabilities to address food waste issues? if yes what capabilities and how.
18. Are you aware of any impact made by stakeholders in Garki districts to reduce food waste? If yes, what are they?
19. Innovation is a contemporary tool for firm performance; do you agree? if yes what role has it play in your firm?
20. How has stakeholders collaborated to adopt the use of innovations? And in which area of the firm's operational stages is this evident (**see 2.4.3, 2.4.4-pre-kitchen, Kitchen, post-kitchen**)
21. How has the stakeholder role influenced the handling of food at the operational stages of your firm? And reduce food waste.
22. How would you describe the result of these stakeholder's collaboration to your firm? if positive will you intend to maintain your achieved result (if any).

23. Is there a matter of importance that I have not mentioned that you think can be beneficial to this research?

Appendix: D

Focus Groups Question Schedule/ 2 Hours.
Each focus group will last for a couple of hours where the purpose of the research and the aim will be introduced first. The format that the focus group will assume will be:

1. OPENING
Everybody in the group is asked to introduce themselves. (e.g., name, organisation, position, years of experience)

2. FOOD SERVICE SECTOR PROFILE
2.1 Describe your experience of working within the food service sector in Garki? What is the management of food service like?
2.2 Can you think of any important situations where food service management was effective and what was your role?

3. FOOD WASTE AND CAUSES AT GARKI DISTRICTS FOOD SERVICE SECTOR
3.1 What do you think about food waste in the food service sector? (in terms of generation and causes)
3.2 What do you consider as the food waste hot spot? e.g., Processing, storage, behaviour etc specifically to your firm.
3.3 Can you think of how food waste occurs in your handling of food? And what is the major course at the three operational levels (Pre-kitchen, Kitchen, and post-kitchen).

4. IMPACT AND CHALLENGES OF FOOD WASTE
4.1 Are there any consequences of wasted food and what are they?
4.2 Which group of the stakeholders are affected by this consequence? and why.
4.3 What are the challenges faced by your firm to reducing food waste? And which of these is the major? And how can firm overcome them?

5. APPROACH TO REDUCE FOOD WASTE FOODSERVICE SECTOR
5.1 What effort is your firm ………………. making to reduce food waste?
5.2 Do you think your firm's effort is worthwhile? if yes, what are your reason for the response and if no, explain why?
5.3 As a……………... what do you do onsite to reduce waste?
5.4 Can you suggest any other good approach to reduce food waste?
5.5 Who should get involved in food waste reduction?

6. DIFFERENT STAKEHOLDERS' COLLABORATION AND FIRM'S INNOVATION IMPACT ON FOOD WASTE.
6.1 Who are the key actors in managing food services (e.g., processing, producing, and managing waste) in Garki?
6.2 How do they collaborate to minimise food waste?
6.3 Do you think they have the required capabilities to address food waste issues? if yes what capabilities are they and how?
6.4 How has the stakeholder capabilities influenced the handling of food at the operational stages of your firm where this waste occurs?
6.5 How would you describe the result of these stakeholder's collaboration to Garki districts food services sector? if positive should it be maintained?
6.6 Innovation is a contemporary tool for firm performance; do you agree? if yes what role does it play in your firm?

6.7 How have different organisations and individuals collaborated to adopt the use of innovations? And in which area of the firm's operational stages is this evident (**see 2.4.3, 2.4.4-pre-kitchen, Kitchen, post-kitchen**)

Any other comments?