FACILITIES MANAGEMENT: 
ENHANCING SOLID WASTE 
MANAGEMENT PRACTICES FOR 
URBAN MARKETPLACES IN NIGERIA

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ABSTRACT

The African urban marketplace environment (MPE) is a space with deep cultural significance forming a focal point of economic and social life in African societies. Every African irrespective of their social status has contact with the marketplace. It is an influential, complex and highly dynamic space that deserves to be effectively managed. However, one significant challenge faced in the management of African marketplaces is how best to manage solid waste in order to provide a safe and clean environment. There is evidence in literature that inadequate solid waste management (SWM) in MPE is related to the attitudes of the market users, which has been incessantly tagged as ‘poor’. Literature also indicates a lack of sufficient understanding of the MPE and the factors that underpin the users’ attitude towards waste. Therefore, the aim of this study is to provide an in-depth understanding of the dynamics of the MPE in order to identify the key underlying factors that underpin the attitude of market users towards waste.

The research is undertaken in the Facilities Management (FM) context. It focuses on the environmental management component of FM with a particular consideration to SWM as a key reoccurring FM theme in the MPE. Primary data generation and collection was undertaken within the City of Port Harcourt, Nigeria. Adopting a sequential mixed model research design, four markets were selected and data generated using non-participant observation, semi-structured interviews, questionnaires and focus group research instruments. Non-participant observation of the four markets was carried out, 43 semi-structured interviews were conducted, and 746 questionnaires were administered. Finally, a focus group session made of 10 market stakeholders across the cases was conducted.

The research established 10 key factors that could enhance the SWM practices in MPE. Through the application of analytical tools - Relative Importance Index (RII) and Interpretive Structural Modelling (ISM) - the relative importance and the interdependencies between the factors were evaluated respectively. An ISM Influence-based Model was developed to serve as a guide for better SWM practices in MPE. The study also identified five key factors that underpin the attitudes of the market users towards waste. Contrary to existing literature, the research established that the trigger and facilitation of desired attitudinal change lies primarily with the market managers rather than the users. These outcomes of the research provide the essential knowledge to market facilities managers particularly in aiding to improve performance in environmental management as a core component of FM services in MPEs. It can be concluded that this research will enhance the effective functioning of markets by providing a safe and clean environment, which will have an impact on the attitude of the community towards waste.
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<th>Description</th>
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<tr>
<td>BIFM</td>
<td>British Institute of Facilities Management</td>
</tr>
<tr>
<td>CSR</td>
<td>Corporate Social Responsibility</td>
</tr>
<tr>
<td>FEPA</td>
<td>Federal Environmental Protection Agency</td>
</tr>
<tr>
<td>FM</td>
<td>Facilities Management</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse Gas</td>
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<tr>
<td>GWMO</td>
<td>Global Waste Management Outlook</td>
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<tr>
<td>IFMA</td>
<td>International Facility Management Association</td>
</tr>
<tr>
<td>ISM</td>
<td>Interpretive Structural Modelling</td>
</tr>
<tr>
<td>IT</td>
<td>Information Technology</td>
</tr>
<tr>
<td>LGC</td>
<td>Local Government Council</td>
</tr>
<tr>
<td>MDGs</td>
<td>Millennium Development Goals</td>
</tr>
<tr>
<td>MICMAC</td>
<td>Impact Matrix Cross-Reference Multiplication Applied to a Classification</td>
</tr>
<tr>
<td>MPE</td>
<td>Urban Marketplace Environment</td>
</tr>
<tr>
<td>MSWM</td>
<td>Municipal Solid Waste Management</td>
</tr>
<tr>
<td>NABMA</td>
<td>National Association of British Market Authorities</td>
</tr>
<tr>
<td>RII</td>
<td>Relative Importance Index</td>
</tr>
<tr>
<td>RSESA</td>
<td>Rivers State Environmental Sanitation Authority</td>
</tr>
<tr>
<td>SDGs</td>
<td>Sustainable Development Goals</td>
</tr>
<tr>
<td>SI</td>
<td>Severity Index</td>
</tr>
<tr>
<td>SSIM</td>
<td>Structural Self Interaction Matrix</td>
</tr>
<tr>
<td>SWM</td>
<td>Solid Waste Management</td>
</tr>
<tr>
<td>UNICEF</td>
<td>United Nations Children’s Fund</td>
</tr>
<tr>
<td>UK</td>
<td>United Kingdom</td>
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<tr>
<td>USA</td>
<td>United States of America</td>
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DEDICATION

I dedicate this thesis to my Dad, for investing immensely in education without prejudice. Your words at the start of this journey remain indelible: “Education is expensive but if you invest in it, you will not regret” – Chief Hon. (Barr.) F. J. Abigo.
DECLARATION

I declare that the research contained in this thesis, unless otherwise formally indicated within the text, is the original work of the author. The thesis has not been previously submitted to this or any other university for a degree, and does not incorporate any material already submitted for a degree.

Signed: Adeni Abigo

Dated: 08-01-2016
Chapter 1. Introduction

1.1. Background to the study

The African marketplace is a facility with cultural significance. It is considered to be part of the heartbeat of African societies because their composition is distinct and unique to African societies (Daily Independent, 2013). They are considered by many to be a fundamental focal point of economic and social life in Africa (Wambugu, 1995; Jiburum et al., 2011). Everyone, irrespective of their social status, has contact with the marketplace in one way or the other (Ladipo et al., 1990). Most African markets operate from sunrise to sunset and cover a large land mass (Jerome and Ogunkola, 2000; Ogeah and Omofonmwan, 2013). A majority of the urban African population rely on the marketplace for a bulk of their needs ranging from foodstuffs, clothing, textile, household utensils, building materials, stationery, and other general merchandise (Ikioda, 2013).

Besides trading, people meet at the marketplace in Africa for various reasons, which include; settling of disputes, meeting friends and kinsmen, catching up on the latest news, exchanging of ideas, learning, religious activities, traditional festivals, political activities including social gathering (Nelson, 1998; Henrich, 2006). Based on its configuration, it provides opportunity for organised programmes by most organisations and Government such as immunisation programmes, family life education, the introduction of new products, political campaigns, aimed at educating and reaching out to the public to be carried out at the marketplace (Wambugu, 1995).

Although most African marketplaces are usually characterised by old, dilapidated and inefficient structures, and a noisy and congested environment, one significant challenge faced in the management of this facility is solid waste management (SWM). The local authorities seem to be at a loss at how best to manage waste in the marketplace (Onyango et al., 2013). Waste is dumped indiscriminately on the ground and in the drains, contributing immensely to the pollution of the physical environment and poses a risk to public health (Olaseha et al., 2005; Balogun, 2012). The market managers are thus faced with a challenge that was non-existent about four decades ago (Okot-Okumu and Nyenje, 2011), of how
best to manage solid waste in this facility in order to provide a safe and clean environment.

The problem is reflected in a range of sustainable development policies. Environmental sustainability and sanitation are a part of the 29 defined thematic areas of VISION 20:2020, one of the developmental programmes of Nigeria set within the framework of the Millennium Development Goals (MDGs) (Accenture, 2009). It became necessary to incorporate sanitation and health into policy programmes in Nigeria as a result of the alarming rate of urbanisation which intensifies environmental problems and sanitation infrastructure.

A new agenda – Sustainable Development Goals (SDGs) – was adopted in September 2015. This new agenda, featuring 17 goals are for a period of 15 years, has an overall aim of ending poverty, promoting prosperity and people’s well-being while protecting the environment (UN, 2015a). The significance of this study lies within the 2020 target of Goal 12 as this study focusses on the handling and disposal of waste by market users, which in turn poses risk to public health and the environment.

1.2. Statement of the Problem

With an estimated population of 1.1 billion and a rapid growth in urban areas (one of the highest in the world at 3.5% annually), municipal solid waste management (MSWM) is one of the most crucial health and environmental problems facing Governments in Africa (Achankeng, 2003; Mwesigye et al., 2009; Haub, 2012). The practice of waste management in Africa is poor and characterised by inefficiencies. Urban centres are characterised by heaps of refuse which results in flooding as a result of blockage to drainage systems and this poses high risk to public health and the environment (Momodu et al., 2011; Edjabou et al., 2012). The inadequacies in MSWM in Africa are mainly attributed to the rapid increase in waste generation because of the alarming urban population growth rate, the lack of the necessary infrastructure, and the attitudes of the populace towards waste (Awosusi, 2010; Agwu, 2012; Ezeah and Roberts, 2014). Hoornweg and Bhada-Tata (2012) postulate that by 2025, the volume of global solid waste will increase by 2.2 billion tonnes, thereby increasing the cost of SWM from $205.4 billion to about $375.5 billion. According to Hoornweg and Bhada-Tata (2012),
the cost increase will be most severe in low income and lower-middle income countries with more than fivefold and fourfold increases respectively. This makes African countries the most vulnerable in terms of cost increase.

The practice of MSWM is no different in the urban marketplace. Waste is dumped indiscriminately on the ground and in open drains, and remains a part of the surroundings of the market users, obstructing movements in and out of the marketplace, and also results in a strong stench as a result of its decomposition (Taiwo and Ajayi, 2013). Aside from the stench, risk to public health and the environment, the indiscriminate dumping of waste in markets also pose risks to fire outbreaks (Abejegah et al., 2013).

The issue of market sanitation, particularly regarding the management of waste, is one of the greatest challenges faced in the management of markets (Bammeke and Sridhar, 1989; Ogeah and Omofonmwan, 2013). There is consistent evidence that inadequate SWM in marketplaces is related to attitudes, lack of adequate waste management infrastructure, lack of awareness and low community participation of the users of this facility (Olaseha et al., 2005; World Bank, 2009a; Balogun, 2012; Brown et al., 2015). There were instances where Governments in various Nigerian States shut down market activities on the grounds of poor waste management practices by the market users. For instance, in February 2012, the Lagos State Government shut down one of its popular food markets for over 72 hours on concerns mainly related to poor waste management practices (Akoni and Olowoopejo, 2012). Also, recently, the Ogun State Government, in an unscheduled inspection exercise, temporarily closed down stores and shops in markets as a result of poor waste management practices by the store owners (Olayinka, 2015). Despite the high risk to public health and environmental problems posed by waste in the marketplace, a World Bank global report established that research into waste management practices in African urban marketplaces is an area that has been neglected (World Bank, 2009a).

Existing research on waste in African marketplaces has mainly focused on the composition of market waste (Bammeke and Sridhar, 1989), a case for participatory and inclusive approach to managing waste in markets (Olaseha et al., 2005; Asomani-Boateng, 2015), awareness and practices of SWM among
market users (Abejegah et al., 2013; Worlanyo, 2013), the challenges of environmental pollution and methods of waste disposal in markets (Taiwo and Ajayi, 2013). Other existing research is on waste from related facilities; abattoirs (Adeyemo, 2002; Adeyemi and Adeyemo, 2007; Emeka et al., 2009; World Bank, 2009a; Nwanta et al., 2010). However, for a variety of reasons discussed in this thesis, the social dimensions of the marketplace facilities management (incorporating the attitudes and behaviours of users) have not been adequately addressed. Thus, in order to enhance the functioning of this facility and to make it a success, there is an urgent need to address the attitudinal actions of the users of this facility towards waste.

Godfrey et al. (2012: p.2167) defines good waste management practice as “waste activities that are compliant with waste and environmental legislation; that promote the waste hierarchy and support waste avoidance, minimisation, reuse and recycling; and that minimise the impact of waste and possible associated pollution on the environment and human health”. Academics have certain ideals of good waste management practices, and this includes: proper waste disposal, minimising waste generation, facilitating easy collection of waste and other sustainable actions towards waste (Davies et al., 2005; Desa et al., 2011; EPA, 2014). The cases studied for this research fall short of the ideal waste management practices and thus requires investigation.

Drawing from the definition of Godfrey et al. (2012), literature suggests that the users of the urban marketplace exhibit a poor attitude towards waste which results in behavioural actions such as indiscriminate dumping in drainages, on the ground and at unauthorised collection points (Olaseha et al., 2005; Balogun, 2012). This results in blockage of drains, air, surface and ground water pollution and risk to public health (Abah and Ohimain, 2010). This negative attitude intensifies the challenge of effective SWM in the urban marketplace, raises hygiene concerns and presents a potential risk to public health. However, although the relationship between attitudes and behaviour in SWM has been acknowledged, there is a lack of research that evaluates and provides the underlying factors that influence the attitudes of the market users towards waste.
It is thus important to understand the context in which these attitudes towards waste exist.

This study is undertaken in the Facilities Management (FM) context and the marketplace environment (MPE) is considered as the ‘facility’. The British Institute of Facilities Management (BIFM) defines FM as “the integration of processes within an organisation to maintain and develop the agreed services which support and improve the effectiveness of its primary activities” (BIFM, Undated). Primarily, the goal of FM is the provision of appropriate services that supports the organisation/business in achieving its primary objective. However, the facilities manager must have a clear understanding of the facility in order to provide adequate support services (Atkin and Brooks, 2014).

As a facility, the MPE is regarded as a socio-economic institution based on its primary objective; urban markets are set up primarily in order to address the developmental objectives of creating wealth and employment (Nwosu, 2008; Oke et al., 2011). The facilities manager’s role therefore is to provide the support services and systems that will facilitate marketplace activities. Based on the problem statement of the study, the environmental component of FM, with particular focus on SWM, is the key concern of this study. In addressing SWM practices of the market users, this study focuses on the handling and disposal of solid waste within the marketplace. It becomes important to provide the market facilities manager with contextual knowledge of the MPE to aid improved performance in SWM practices.

1.3. Research Goals

1.3.1. Aim

The research provides an in-depth understanding of the dynamics of the MPE in order to identify the key underlying factors that underpin the attitudes of market users towards waste.

The aim of this study is informed by the World Bank (2009a) global report that established that research on waste management in African marketplaces is an area that has been neglected despite the high risk to public health and environmental problems posed by waste in this facility. Also, literature reveals
that the challenges of SWM is exacerbated by the attitudes of the people (Agwu, 2012; Balogun, 2012). Literature continually tags the attitudes of the people as ‘poor’ and have apportioned the blame for SWM problems on the users without providing answers as to why people behave in a particular way regarding waste. It therefore suggests that for the SWM concerns in the MPE to be resolved, it is desirable to first identify the factors that could enhance SWM practices of the market users and the key underlying factors that underpins the users’ attitudes towards waste.

1.3.2. Research Questions

The study recognises a gap in knowledge with regard to the dynamics of MPE in relation to SWM practices, and the underlying factors that influence the attitudes of the market users towards waste. There is a need to understand what drives or underpins the attitudes of the market users towards waste. The study will thus provide answers to the following questions:

1. What are the dynamics of the MPE with reference to SWM practices?

2. Why do we still have markets where waste is a problem?

   2.1. How do we enhance SWM practices in the MPE?

   2.2. What are the key underlying factors that underpin the attitudes of the market users towards waste?

1.3.3. Objectives of the Study

The following objectives have been identified to help provide answers to the research questions, which in turn will achieve the overall aim of the study:

1. To investigate the nature of African urban marketplaces in order to develop an in-depth understanding of the multi-dimensional nature and social expectations of its markets, viewed as a facility in the FM context;

2. to examine SWM practices in the urban marketplace environment (MPE) in Nigeria with particular consideration to the effect of market remodelling;

3. to identify and validate the key factors that could enhance SWM practices of the market users;
4. to validate the factors that market facilities managers need to incorporate in the development of SWM strategies for MPEs.

The starting point of the study is having an understanding of the dynamics of African urban marketplaces. This is important in order to provide an understanding of the use of space, market operations and the interactions that occur in marketplaces. At the same time, knowledge on SWM practices within the MPE is provided which entails having a clear understanding of the market user’s perception regarding SWM. In examining SWM practices in the MPE, the impact of the remodelling of markets especially with reference to SWM will be evaluated in order to determine its effect on the SWM practices of the market users. The factors that would enhance the SWM practices of the market users will be identified and validated with the market stakeholder. The factors will be further evaluated and validated in order to provide market facilities managers with an understanding of the factors, so as to enhance decision making processes. Also, in the course of achieving the objectives, the study will identify the underlying factors that underpin the attitudes of the market users towards waste.

1.4. Scope of Research

The research is on African urban marketplaces with particular reference to Sub-Saharan Africa. The study focuses primarily on the West African sub-region - specifically Nigeria - for the case studies and primary data generation and collection. For this study, the use of the word ‘African marketplace’\(^1\) refers only to markets in Sub-Saharan Africa.

Nigeria has the highest urban population in Africa with a majority of the urban population relying on markets for the supply of their daily needs (Ikioda, 2013). However, in comparison to other West African countries, Nigerian markets have not been given considerable research attention since the 1980s (Porter et al., 2007). This reveals the need for studies on markets in Nigeria.

\(^1\) Reference to African marketplace by various materials used for this study connotes Sub-Saharan African marketplaces.
This study is focused on a particular type of urban market: mixed markets - markets that offer a variety of products - and Port Harcourt was chosen as the case study city for this research.

Port Harcourt, usually referred to as the ‘Garden City’ of Nigeria, is the capital of Rivers State. Port Harcourt is located in the Niger Delta region of Nigeria and is an operational base for multinational petro businesses (UN-HABITAT, 2009). However, as a result of the overwhelming presence of littered and heaps of waste around the urban centre, Port Harcourt is often referred to as the ‘Garbage City’ of Nigeria (Ayotamuno and Gobo, 2004).

Although waste management practices have been well studied in Port Harcourt (Ayotamuno and Gobo, 2004; Igoni et al., 2007; Ogbonna et al., 2007; Abah and Ohimain, 2010; Agwu, 2012; Babatunde et al., 2013), SWM practices in marketplaces have not received a sustained academic treatment despite the high risk to public health and environmental problems posed by waste in marketplaces. Studies on markets in Port Harcourt, which is one of Nigeria’s major cities, are lacking (Ikioda, 2012). Studies related to waste in Port Harcourt marketplaces examined the environmental and health impact of abattoir waste on a particular creek and its environs (Emeka et al., 2009). Recently, Brown et al. (2015) examined the social and economic impact of marketplaces on its environs and briefly stated the environmental effect of marketplaces of which SWM is of crucial concern. However, despite being one of Nigeria’s major cities, the region lacks detailed studies on SWM practices in its marketplaces.

Also, Port Harcourt was chosen based on geographic confidence in collating data; the researcher had confidence in obtaining data and information for the research project. Yin (2014) makes a case for the importance of sufficient access to data.

1.5. Thesis Outline

The outline of the thesis is summarised below;

Chapter One – Introduction: This chapter provides an overall background to the study and justifies the importance of undertaking this study. It relays the context in which the study is being undertaken and sets out the research goals.
Chapter Two – Facilities Management: This is the first of three literature review chapters. The aim of this chapter is to clearly establish the context in which the study is undertaken. This is a key aspect of literature review as the MPE is being analysed as a facility. FM literature is reviewed in order to develop a better contextual understanding of MPEs as a facility, in order to be more informed about the potential elements that should be analysed in the study of SWM in MPEs. In this chapter, a conceptual model of a facility was developed based on existing FM theories. The model was further conceptualised as an FM system adopting the systems methodology. The conceptual model guided the research in establishing an in-depth understanding of the MPE in the FM context.

Chapter 3 – Understanding urban marketplaces: This chapter defines the problem situation and provides a review of the facility being studied; the African Urban Marketplace. This chapter provides an understanding of urban marketplaces in Europe and Africa; its components, settings and its role in the society. MPE stakeholders were identified and mapped based on the understanding of their role from literature. This chapter also signals the opportunity the MPE presents in terms of developmental strategies, revealing evidence of successful models/programmes introduced via the MPE. This is an important context because it relates the methodologies adopted by organisations in trying to bring about attitudinal change within the users of the MPE. It enabled the researcher during the empirical phase of the study to investigate the methodologies and strategies that have been used by other organisations to achieve their goals. Furthermore, the chapter reveals the need to understand the challenges facing SWM practices in MPEs.

Chapter 4 – Municipal solid waste management practices: The chapter reveals the knowledge gaps being addressed by the study. It starts off with a global concept of the practice of MSWM and also discusses the practice in Africa. A detailed discussion of the practice of MSWM in Nigeria with a further emphasis on the practices in the case study is provided. A model depicting current MSWM practice in Nigeria was developed and the context in which attitude is being studied was also established. At the end of this chapter, the knowledge gaps identified throughout the literature review chapters were synthesised in order to come up with the gap in knowledge of the study.
Chapter 5 - Research methodology and design: The chapter reveals the overall methodological approach adopted for the study. The chapter also provides the criteria for the case study selection. The ethical concerns associated with undertaking the study are discussed, providing details on how these concerns were addressed and managed throughout the course of the study.

Chapter 6 – Observations from urban marketplaces in Port Harcourt, Nigeria: This is the first of the three results chapters from empirical work. Based on the evidence of empirical work, the aim of this chapter is to provide an understanding of market life revealing the socio-cultural dimensions of the use and social expectations of urban market spaces. The chapter begins with the provision of the characteristics of the case studies: two remodelled and two old markets. The themes presented and discussed in relation to relevant literature in this section include: the dynamics of the marketplace, the process of remodelling markets and the impact of the remodelling on market life, and the culture and social expectations in the use of market space. This chapter thus provides the market facilities manager with the prerequisite and contextual knowledge of the MPE to aid effective and improved performance of SWM practices.

Chapter 7 – Solid waste management practices in marketplaces: This chapter presents an in-depth and sophisticated understanding of attitudes towards waste in marketplaces of a range of different market stakeholders - traders, buyers/visitors, MPE regulators and the waste handlers. The themes presented and discussed in relation to relevant literature in this section include: SWM practices in MPEs, the ‘impact’ of remodelled markets on SWM practices, and the factors that could enhance SWM practices in MPEs.

Chapter 8 – Enhancing Solid Waste Management Practices in Marketplaces: The study realised a weakness in existing literature relating to the provision of the interdependencies of factors that could enhance waste management processes. In this chapter, the factors identified in chapter 7 were evaluated in order to provide market facilities managers with a holistic understanding of the factors in order to inform decision-making processes.

Chapter 9 – Conclusions and Recommendations: This is a summary of the entire research. The chapter presents and discusses how the research goals were
achieved and the research contributions to knowledge. Recommendation for future research are presented at the final section of this chapter.
Chapter 2. Facilities Management

2.1. Introduction

This chapter is aimed at establishing the context in which the study is undertaken. Although the MPE is an important feature in the African society, in contrast to MPEs in developed economies, the effectiveness of how markets are managed, especially in terms of SWM, is of utmost concern based on the risk associated with inappropriate SWM practices. It becomes important to adopt the FM approach in the management of this facility.

In this chapter, the concept and scope of FM is defined in order to provide the overall context of the study that is being undertaken. The core competencies of FM were discussed in line with the provisions of the British Institute of Facilities Management (BIFM) and International Facility Management Association (IFMA) in order to depict the understanding of effective FM. A definition of a ‘facility’ is established based on the interpretations from varied FM theories. A conceptual model depicting the components of a ‘facility’ was developed and a further analysis based on the systems thinking methodology was undertaken. The developed conceptual model serves as a guide throughout the study (especially during the empirical phase) in establishing an in-depth understanding of the MPE.

2.2. The Concept of Facilities Management

In order for an organisation to function effectively, the appropriate management of its non-core business (both physical and support services) is essential. This invariably leads to users’ satisfaction thereby improving the performance of the users of the facility. Nutt (2004) affirms that the provision and management of the right infrastructure and services improves the performance and wellbeing of individuals and their respective organisations. In other words, the effective functioning of organisations or businesses hinges on the success or failure in the provision of appropriate FM services. Also, Green and Jack (2004) posits that the provision and management of the appropriate support environment for organisations gives such organisations a competitive advantage over organisations that have not created and sustained the appropriate support
environment for their business. This thus reveals the relevance given to FM today by organisations.

The practice of FM can be traced to the USA in 1960’s when its practice was associated with the management of information technology (IT) systems and networks in the workplace (Wiggins, 2010). Today FM has evolved to a multifaceted profession having multiple definitions for its practice as demonstrated in Table 2.1.

**Table 2.1: Sample of FM Definitions**

<table>
<thead>
<tr>
<th>Author</th>
<th>FM Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kincaid (1994)</td>
<td>The process that provides the working environment in which an organisation functions.</td>
</tr>
<tr>
<td>Barrett (1995)</td>
<td>An integrated approach to maintaining, improving and adapting the building of an organisation in order to create an environment that strongly supports the primary objectives of that organisation.</td>
</tr>
<tr>
<td>Alexander (1996)</td>
<td>The process by which an organisation ensures that its building, systems and services support core operations and processes as well as contribute to achieving its strategic objectives in changing conditions.</td>
</tr>
<tr>
<td>Tay and Ooi (2001)</td>
<td>The integrated management of workplace to enhance the performance of the organisation.</td>
</tr>
<tr>
<td>Wiggins (2010)</td>
<td>The development, co-ordination and management of all non-core, support services of an organisation together with the building, including their systems, plant, IT equipment, fittings and furniture, in such a way as to positively assist an organisation in achieving its strategic objectives.</td>
</tr>
<tr>
<td>IFMA (Undated)</td>
<td>A profession that encompasses multiple disciplines to ensure functionality of the built environment by integrating people, place, process and technology.</td>
</tr>
<tr>
<td>BIFM (Undated)</td>
<td>The integration of processes within an organisation to maintain and develop the agreed services which support and improve the effectiveness of its primary activities.</td>
</tr>
</tbody>
</table>

* The term workplace in this context refers to a (any) place where activities are carried out in order to meet the set objectives of the organisation/business.
The definitions illustrated in Table 2.1 reveals that, as the profession evolves, a more robust and coherent meaning is given to FM with increased emphasis on the integration of all processes; people, the physical asset and support services.

‘Integration’ and ‘maintenance’ are key reoccurring themes from the definitions in Table 2.1 that should be incorporated in the practice of FM, which will lead to an expected output – improving the performance of the organisation or business and the wellbeing of the users of the facility. In other words, FM entails the appropriate integration and maintenance of systems that form part of an organisation and will result in the provision of the right environment to aid the efficiency of the organisation/business, and at the same time provide a pleasant environment for the users/occupants of the facility in order to improve their performance. It then means the environmental component is fundamental for effective FM. In the context of this thesis, the provision of the right FM service in terms of SWM, will provide the market users with a clean, conducive and safe environment and will address the risks associated with inappropriate handling and disposal of waste.

Also, based on the various definitions in Table 2.1, it can be deduced that FM has a common consensus; the definitions reveal that the aim of FM essentially is to provide services that support the organisation/business to achieve its primary objectives. However, that the practice of FM differs as a result of the diverse businesses suggests that each organisation will have different FM needs/services. Also, the country and culture where the businesses exist are also contributory factors on FM practice and perception. These factors to an extent suggest the basis of the multiple FM definitions. Atkin and Brooks (2014) thus advocates that it is important that the facilities manager has a clear understanding of the core business or primary objective of the organisation/business taking into consideration the environment in which the organisation/business exist in order to provide effective FM services.

The FM industry in Nigeria is still at its infancy stage with no nationally recognised standards (Oladokun, 2011). It is however affiliated to the IFMA and currently adopts the IFMA methodologies and practices. It therefore adopts the IFMA definition of FM as a profession that encompasses multiple disciplines to ensure functionality of the built environment by integrating people, place, process and
technology. It is simply a service that is provided to support the organisation/business to achieve its primary objectives. Three main things influence the nature of the FM service offered: the type of organisation that the service is offered to; the business objective targeted; and the environment in which the business exist.

2.3. The Scope of Facilities Management

In time past, owing to the nature of FM practice; all-encompassing and an evolving profession, there exist various contentious views on precisely what constitutes FM practice and its boundaries (Bell, 1992; Tay and Ooi, 2001). According to Bell (1992), FM has been vulnerable on occasions to being used in a narrow technical sense, as well as in broader context as a result of a lack of definition and understanding of the term. Tay and Ooi (2001) thus argued that in order to enhance the FM profession, the role and scope of FM must be clearly defined. In light of this, today, two of the leading FM associations; the BIFM and the IFMA have developed a framework as illustrated in Table 2.2 and 2.3 respectively that defines the core competencies of FM practice.

The BIFM framework as illustrated in Table 2.2 broadly describes 10 functional areas and its components of FM practice. This framework according to the BIFM is a ‘living’ document that will be reviewed as the profession evolves in order to keep abreast with the changing needs of the industry.

The left hand side of the table represents key functional roles of a facilities manager in any given environment, the right hand represents the key components of the functional role, whereas the middle column gives a concise description of the competence required of the facilities manager in carrying out FM activities.
Table 2.2: The Facilities Management Professional Standard Framework

<table>
<thead>
<tr>
<th>FM Functional Areas</th>
<th>Descriptor</th>
<th>Components</th>
</tr>
</thead>
</table>
| The role of FM | Manages FM knowledge to add value to an organisation | - Sector knowledge  
- Information and knowledge management |
| Strategy and policy development | Develops FM strategy and policy | - FM strategy  
- Corporate social responsibility  
- FM policy |
| Leadership and management | Develops and manages a highly motivated and skilled FM workforce in a dynamic environment | - Project management  
- People Management  
- Change management |
| Business continuity and compliance | Builds business resilience and contains business risk | - Risk management  
- Compliance |
| Business support services management | Delivers and innovates FM service solutions aligned with business objectives | - Service innovation  
- Managing service delivery |
| Property portfolio management | Maximises and protects the value of property assets and ensures their fitness for purpose. | - Building maintenance  
- Property and asset management  
- Space management |
| Quality management and customer service | Fulfils customer expectation and quality requirements. | - Customer service  
- Stakeholder relationships  
- Quality management |
| Finance and IT | Optimises finance and IT resources | - Financial management  
- Information Technology |
| Procurement and contract management | Creates value through procurement and contract management. | - Procurement  
- Contract management |
| Sustainability | Minimises the impact on the environment through sustainable practises and the efficient use of resources. | - Energy management  
- Environmental management |

The framework also provides a succinct description of the facilities manager’s role at various levels; strategic, management and operational level. At the strategic level, the facilities manager focuses more on the future and is more concerned with decisions and plans that are in line with the organisation’s policy and strategic plans (Chotipanich, 2004). At the management level, the facilities manager is responsible for planning and developing courses of action that support the strategic and operational developments including initiating and leading tasks and processes (BIFM, 2014b). Whereas the operational role is more concerned with the current situation, otherwise known as the day-to-day provision of a safe and pleasant working environment (based on the FM strategy for the organisation) in order to enhance the performance of the organisation. At
the operational level, the facilities manager delivers their activities as based on directions. The activities at this level are the output of the strategic and management plan.

Although each FM functional area highlighted in Table 2.2 appears to be distinct, they seem interrelated as some of the functional areas rely on the outcome of another or work in hand with each other.

The IFMA on the other hand, defined 11 core competencies of FM practice as shown in Table 2.3 (IFMA, 2009). This definition according to IFMA is based on responses from facilities managers in 62 countries.

**Table 2.3: 11 Core Competencies of Facilities Managers**

<table>
<thead>
<tr>
<th>FM Core Competencies</th>
<th>Description/Components</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Communication plans and processes for both internal and external stakeholders.</td>
</tr>
<tr>
<td>Emergency Preparedness and Business Continuity</td>
<td>Emergency and risk management plans and procedures.</td>
</tr>
<tr>
<td>Environmental Stewardship and Sustainability</td>
<td>Sustainable management of built and natural environments.</td>
</tr>
<tr>
<td>Finance &amp; Business</td>
<td>Strategic plans, budgets, financial analyses, procurement.</td>
</tr>
<tr>
<td>Human Factors</td>
<td>Healthful and save environment, security, FM employee development.</td>
</tr>
<tr>
<td>Leadership and Strategy</td>
<td>Strategic planning, organise, staff and lead organisation.</td>
</tr>
<tr>
<td>Operations and Maintenance</td>
<td>Building operations and maintenance, occupant services.</td>
</tr>
<tr>
<td>Project Management</td>
<td>Oversee and manage of all projects and related contracts.</td>
</tr>
<tr>
<td>Quality</td>
<td>Best practices, process improvements, audits and measurements.</td>
</tr>
<tr>
<td>Real Estate and Property Management</td>
<td>Real estate planning, acquisition and disposition.</td>
</tr>
<tr>
<td>Technology</td>
<td>Facility management technology, workplace management systems</td>
</tr>
</tbody>
</table>
Although the competencies of IFMA (Table 2.3) are slightly grouped differently from that of BIFM (Table 2.2), both (BIFM and IFMA) frameworks address and cover virtually same competence areas of FM practice. However, one FM functional area not addressed by the IFMA’s classification is the role of FM, which is of two components; sector knowledge, and information and knowledge management (Table 2.2). Based on the above, the study adopted the competence framework as provided by the BIFM (Table 2.2).

Adapted from BIFM (2014a), below is a brief description of each functional area, their components and the overall expected competency of facilities manager in carrying out FM functions for organisations:

- **The role of FM:** This is the first functional area as shown in Table 2.2. It is made of two components; sector knowledge, and information and knowledge management. In order for the facilities manager to be efficient in the delivery of FM services, the facilities manager must have an in-depth understanding of the organisation. This role requires the facilities manager to influence and promote FM nationally and internationally within and beyond the sector. The second component - information and knowledge management - requires the facilities manager to develop, manage and analyse information that will enhance the performance of the organisation (BIFM, 2014a).

- **Strategy and Policy Development:** This FM functional area consists of three components; FM strategy, corporate social responsibility (CSR) and FM policy. FM strategies are usually developed in line with the core business strategy of the organisation (Barrett and Baldry, 2003). In other words, in order for the facilities manager to develop an appropriate FM strategy, it is expected that the facilities manager have knowledge and understanding of the core business of the organisation. This component (FM strategy) is interrelated with the first FM functional area, as it is expected of the facilities manager to have knowledge of the organisation before an appropriate FM strategy can be developed for the organisation. The facilities manager is expected to implement and monitor the FM strategy to ensure it is in line with the core business strategy and make
recommendations for improvements where necessary (BIFM, 2014a). The CSR component requires the facilities manager to develop, track, document, deliver and influence sustainable performance of the facility (Michael, Undated). As regards FM policy, the facilities manager ensures the FM policies developed are in line with the organisation’s business and conforms to legal requirements (BIFM, 2014a).

- **Leadership and Management**: This functional area comprises three components: project management, people management and change management. Project management is concerned with delivering new projects within the stated time constraints at the agreed cost and expected level of quality (Best et al., 2003). Also, in the course of managing projects, it is a criterion that the stakeholders are kept satisfied through each phase of the project. The facilities manager is expected to monitor and manage a project through completion thereby adding value to the organisation.

The second component – people management - is concerned with building a highly skilled and motivated FM workforce. The role of facilities manager is to create a comprehensive framework for the development of FM workforce, set clear FM objectives in line with the organisation’s objectives, motivate and monitor the FM team to meet set FM objectives (BIFM, 2014a).

The third component – change management - involves the management of transitioning processes. The facilities manager is expected to monitor FM trends and future direction of FM in order to predict FM changes and initiate the need for change within the organisation (BIFM, 2014a).

- **Business Continuity and Compliance**: This FM functional area comprises of risk management and compliance components. Risk management in FM involves the identification, analysis and responding to the underlying uncertainties in the facility’s life cycle (Best et al., 2003).

As regards the second component – compliance - it is expected that in the delivery of FM services the facilities manager monitors and ensures that they adhere to the relevant legislations (Wiggins, 2010). The facilities
manager is expected to be conversant with legislations that affect the delivery of FM services.

- **Business Support Services Management:** This functional area consists of two components: service innovation and managing service delivery. According to Pitt (2005), innovation results in added value to the core business. Thus, the responsibility of the facilities manager in service innovation is to forecast and recognise new trends and future developments to improve FM delivery within and outside the organisation (BIFM, 2014a).

  Managing service delivery, on the other hand, involves designing a service delivery system that focusses on creating value to the organisation and at the same time engaging frontline employees in the delivery process (Ankerstjerne, 2015).

- **Property Portfolio Management:** This comprises three components: building maintenance, property and asset management, and space management. The role of the facilities manager in building maintenance is to develop, manage, implement, monitor and review maintenance strategy for the property portfolio with the use of various management systems and technology available (BIFM, 2014a).

  In delivering property and asset management services, the responsibility of the facilities manager involves the development of an asset plan that provides adequate direction for successful real estate management (FMLink, Undated).

  The third component – space management – involves the management of the physical space of an organisation by means of tracking, maintaining occupancy information, generating projections of future space needs, and reporting on space data including proposals for a change in the use of space (Jackson, 2015).

- **Quality Management and Customer Service:** There are three components in this FM functional area; customer service, stakeholder relationship, and quality management.
Customer service is a continuous process that requires excellent communication with clients and at the same time embedding a passion for good service delivery in order to meet the needs of the client (FMWorld, 2010). The second component – stakeholder relationship - involves developing, building and maintaining productive relationships with stakeholders and also monitoring and reviewing the effectiveness of the stakeholders’ relationship (BIFM, 2014a). The third component – quality management - is defined by Wiggins (2010) as an organisation’s commitment to customer satisfaction through continuous improvement of services rendered. It is thus expected that the facilities manager embed a culture of quality in the delivery of FM services.

- **Finance and Information Technology (IT):** Best et al. (2003) describes financial management as a critical ingredient in the management of facilities. Besides preparing financial cases, financial management entails developing and managing budgets and also evaluating and monitoring financial performance against budgets (BIFM, 2014a). IT, on the other hand, requires the strategic management of the IT functions in order to be effective and efficient in FM service delivery (Knights, 2010).

- **Procurement and Contract Management:** Procurement is concerned with the development, implementation and management of procurement strategy to ensure it is in line with the organisation’s corporate objectives and also ensuring value for money is achieved (BIFM, 2014a). Contract management, on the other hand, includes developing and evaluating the effectiveness of contract management policies and the management of all contracts associated with the management of the facility while ensuring compliance with relevant regulations (BIFM, 2014a).

- **Sustainability:** This is the tenth FM functional area and comprises energy management and environmental management. The components are concerned with reducing the impact of the organisation’s activities on the environment. In energy management, the facilities manager is concerned with making strategic decisions that results in the organisations’ use of energy at a minimum cost (Vidler, 2011). In environmental management,
on the other hand, it is the responsibility of the facilities manager to analyse and report on environmental and waste management issues and also influence and improve environmental awareness and introduce behavioural change programmes amongst the key stakeholders (BIFM, 2014a).

With reference to the above defined FM functional areas and its components by the BIFM and IFMA, there are no laid down guidelines as to how to provide FM services or what FM services are to be provided in organisations. According to Atkin and Brooks (2014), even organisations within same sector would differ in their FM needs. The key issue in FM is thus not competency but the understanding of the facility – its nature, purpose and use, and the environment in which it exists in order to develop a strategy that will enhance the operations of the organisation and at the same time providing a conducive environment for the users/occupants of the facility.

A specific competency that requires adequate attention as a result of its impact on public health and the environment is SWM. This study focuses on the handling and disposal of waste within the MPE. In focusing on the waste management element, the study will also provide the facilities manager with the contextual knowledge of the MPE in revealing the dynamics of the marketplace. This knowledge will enhance the facilities manager’s role in addressing SWM practices in the MPE.

2.4. Defining a Facility

There are a number of interpretations of what could be defined as a facility. To an extent, it depends on the context in which the facility is being put to use. For instance, in the context of analysing strategic FM, Jack (1994) described facilities as the buildings and services provided for the occupants/customers. From his standpoint, a facility includes nothing other than buildings and services. Williams and Bernard Williams (1996) defined facilities in a business context as “the premises and services required to accommodate and facilitate business activity”. The emphasis on this definition is on the premises and services. The interpretation of premises in this context would include the building(s), facilities, infrastructure and any other factor that would facilitate business activity. In
addition, human resource, which involves the services people contribute to an organisation, could arguably be interpreted as services that facilitate business activities. Thus the following components can be drawn from the definition of Williams and Bernard Williams (1996); facilities, buildings, infrastructure, people and services.

Best et al. (2003) in defining a facility from an organisation’s viewpoint, gave a broader view of what defines a facility and posit that the business or primary activity of an organisation shapes the facility; thus a facility in addition to the physical structure includes the people, the organisation’s culture and strategy and the systems. In their definition, Best et al. (2003) attributes the components that give the workplace relevance in a facility. This includes people, infrastructure, facilities, services, the business of the organisation, the organisational culture and strategy, and systems.

The Oxford Dictionary of English by Stevenson (2010) simply defines a facility as a “place, amenity or piece of equipment provided for a particular purpose” or as “an establishment set up to fulfil a particular function or provide a particular service”. With reference to the dictionary definitions, the essence of the existence of facilities must be to serve a particular purpose. This suggests that the setting up of facilities is purpose-driven. For instance, it could be a workplace established for making monetary returns or a hospital established to meet/attend to the needs of the sick or it could also be a waste treatment plant. In all, facilities do not exist in isolation. In other words, if a facility is set up to achieve a particular purpose it refers to the entire components that make up this facility thereby making it efficient. For example, a hospital building cannot attend to the needs of the sick, it works in conjunction with other components; people, facilities and systems.

The definitions provided by Best et al. (2003) and Williams and Bernard Williams (1996) correlates with that of the Oxford Dictionary of English by Stevenson (2010) in defining a facility. Based on these definitions, it is thus logical to take into cognisance the components that enable the facility function for the purpose it was built and refer to the combination of the components as the ‘facility’.

Figure 2.1 depicts a conceptural framework of a facility, portraying its components based on the various definitions and the interpretation derived for this research.
Figure 2.1: Conceptual Framework of a Facility

Based on the interpretations of the definitions, a facility is made of at least four components as depicted in Figure 2.1. It is thus, the management of these components that encompasses FM.

The conceptual framework focuses on four main components that make up a ‘facility’ and are described as follows;

- **The People:** These are persons or group of persons that carry out individual and related activities in the facility. Pemsel et al. (2010) defined the end-users as those who use or occupy the building and they only have knowledge and opinion about its performance in relation to their user objective. The users of a facility are defined by the use the facility is being put into. For instance, for offices, Vischer (2008) categorises the users as the individual user, the team and the organisation. Their use of the facility varies as their task differs depending on the assignment being undertaken at the time.

- **The Business:** This refers to the core business or primary activity that defines the operations of the organisation. This also includes soft issues
such as organisational culture, strategy and systems as addressed by the definition of Best et al. (2003).

- **Buildings, Facilities and Infrastructure:** These components facilitate the functioning of the facility. They make the use of the facility more convenient and enjoyable and contribute immensely to users’ satisfaction in the use of the facility. Without these components, the facility is more or less inadequately furnished for the users. Thus, they can be said to be an integral component of the facility. For instance, users of an office space in Europe will have an unpleasant experience without toilets, parking spaces, lifts (depending on the number of floors), and heating, ventilation and air-conditioning (HVAC).

- **Business support services:** These are actions or activities provided to support the functioning of the facility as shown in Figure 2.2. They are activities carried out in order to maintain the physical structure and support services that operate within the space that supports those services (Musa and Pitt, 2009). Although cost is incurred in the provision of services, the provision and management of services in a facility is vital as it facilitates the provision of a pleasant environment and guarantees users satisfaction.

Based on various literatures, Chotipanich (2004) put together a cluster of services as illustrated in Figure 2.2 provided for facilities. With reference to Figure 2.2, there are barely any organisations that will need all of the services listed. The facilities manager is saddled with the responsibility of understanding the needs of an organisation or business in order to provide the appropriate services that will support the core/primary business.
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<tr>
<th><strong>Real Estate &amp; Property Management</strong></th>
<th><strong>Facility Project Management</strong></th>
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<td>Location searching and selection</td>
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<td>Lease Negotiation and management</td>
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<td>Landlord activities and Rent review</td>
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<td>Leasing and sub-letting services</td>
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<td>Retail outlets and space renting</td>
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<td>Maintenance and repair plant</td>
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<td>Long-term resource planning</td>
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<td>Post and mail distribution</td>
<td>Mid-term resource planning</td>
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<td>Courier services</td>
<td>Annual resource planning</td>
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<td>Telephones</td>
<td>Work programming</td>
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<td>Records management</td>
<td>Development planning</td>
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<td>Print and fax</td>
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<td>Storage and distribution</td>
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<td>Reception, and telephone operator</td>
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<td>Public relations/Governmental affairs</td>
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<td>Facility planning/master planning</td>
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<td>Space Planning:</td>
<td>Budget and cost control</td>
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<td>Space configuration and reconfiguration</td>
<td>Purchasing and Contract control and negotiation</td>
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<td>Space allocation, utilisation and relocation</td>
<td>Office furniture and stationary provision</td>
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| **Employee supports and Services** | |
|----------------------------------| |
| Child Nursery provision | |
| Restroom | |
| Workplace nurseries | |
| Recreations | |
| Catering | |
| Residential accommodation | |
| Community affairs | |
| Employee special services | |

**Figure 2.2**: Assemblage of FM Services  
Source: Chotipanich (2004)
The focus of this study is within the waste disposal and environment management services as illustrated in Figure 2.2, which is also a core component of FM (Table 2.2). The study appraises SWM practices with particular reference to the handling and disposal of waste within the MPE.

Adequate management of this support service – SWM - is essential to providing a safe and clean market environment in order to enhance market activities. The management of solid waste also addresses public health and environmental concerns associated with the use of market space. It is thus an integral component that requires adequate attention in order to enhance market life and the performance of the facility as a whole.

2.5. Understanding the Facility as a System

In order to comprehend and establish the interactions and interrelationship that occurs at the African marketplace a conceptual approach in the form of systems concept was adopted based on the systems theories. Literature suggests that the systems concept can be applied to almost any area as a result of its generality and its comprehensibility (Laszlo and Krippner, 1998; White and Mingers, 2010; Pan et al., 2013). The application of the systems theory for this study enables an understanding of the dynamics and interactions between the various components within the MPE and guides the research in establishing an in-depth understanding of the MPE in FM context.

According to White and Mingers (2010) the systems ideology includes:

- Viewing the situation holistically as a set of diverse interacting elements within an environment,
- In determining the behaviour of the system, recognising that the relationship/interactions between elements are more important than the elements themselves,
- Recognising a hierarchy of levels of systems, the consequent ideas of properties emerging at different levels and the mutual connection within and between levels,
• Accepting (especially in social systems) that people will act in accordance with differing purposes.

Based on the context of the study being undertaken, this study relied on Ackoff (1981) definition of systems. Ackoff (1981) defines a system as a set of two or more interrelated components with properties such as;

1. Each component having an effect on the functioning of the whole.

2. Each component is affected by at least one other component in the system.

3. All possible subgroups of components also have the first two properties.

This invariably means that a system is made of more than one component and these components interact, influence and exhibit some form of relationship that enables the system to function as a whole.

Relating Ackoff’s definition to a facility; a facility has two or more interrelated components (see Figure 2.1); people, the business, buildings, facilities and infrastructure, and business support services. And each of the components of a facility has the properties as stated in Ackoff’s definition. For instance, the core business of a facility has an effect on the functioning of the entire facility and is also affected by the support services thus achieving the first two properties of Ackoff’s definition. In addition, subgroups of the components that make up a facility have the first two properties. For example, the people would include the different categories of users of the facilities and the functioning of the users is dependent on the infrastructure or services provided. Thus, the subgroups also exhibit the third characteristics of Ackoff’s definition.

Systems generally could be either open or closed. An open system operates within an environment (although the environment is not a part of the system) and allows interaction in the form of information/resources between its components and the environment, thus the environment could affect the system. Closed systems on the other hand, operate without impacts from the environment and are not affected by the changes that occur within the environment (Newcombe et al., 1990). The incoming interactions are referred to as ‘input’ while the outgoing
interactions are ‘output’ and these interactions flow through the permeable boundary between the system and the environment and most often as a result of the relationship between the systems and the environment, a cycle of events is established when part of the output is fed back as an input. This is referred to as feedback (Steeg, 2000).

The word environment in this context refers to the external environmental forces which may have an influence on the operations of the system (Brooks and Weatherston, 2000). In order to have a comprehensive concept of the environment in which a facility operates, it is important to identify and analyse the external factors that affect the facility. One of such tool applied in the identification and analysis of the macro environment is PESTLE.

PESTLE is an acronym for Political, Economic, Socio-cultural, Technological, Legal and Environment (Wetherly and Otter, 2011). It enables the identification and assembling of logical and comprehensive representation of the environment in which a business/organisation operates (Brooks and Weatherston, 2000). Applying the definitions of Sievers (2008) and Brinkman (2010), a summary of the definitions of the environmental forces are presented below. Also, Figure 2.3 depicts the FM system indicating the various environmental forces.

- Political forces: This refers to the country’s political structure and stability.
- Economic forces: These are changes in economic conditions that affect operations of the facility.
- Socio-cultural forces: This refers to the norms, attitudes and lifestyle of the populace that influences the use of the facility.
- Technological forces: The level of advancement in technology that influences the operation of the facility.
- Legal forces: Existing laws and regulations that influences the operation of the facility.
- Environmental forces: This refers mainly to the influence from the physical environment.
Figure 2.3: The FM System
A facility exhibits the characteristics of an open system as they have input (in the form of services, resources, information, etc) and outputs (services, information, etc) and operates within an environment of which the changes within that environment could affect the functioning of the facility. For example, new legislation or a change in technology will have an impact on the functioning of a facility. Based on these interactions that occur between the components of a facility and its environment, a facility can thus be analysed as an open system.

The facilities manager is expected to manage the various components and their interactions with one another and the environment, and also the inputs and outputs, in order to enhance the facility.

The conceptual framework (Figure 2.1 and 2.3) is further developed in Chapter 6 of this study based on primary data collected.

2.6. Summary and Conclusions

This chapter has provided a background on the concept and scope of FM adopting the framework of the BIFM in defining the scope of FM. The BIFM framework was adopted because it recognises the role of FM as one of FM functional areas. The components within this functional area are sector knowledge, and information and knowledge management. This functional area provides that the facilities manager must have an in-depth understanding of the facility in order for the facilities manager to be efficient in the delivery of FM services.

In this chapter also, a conceptual framework of a facility was developed based on existing definitions.

Based on the reviewed literature in this chapter, the following deductions were drawn;

- FM entails the appropriate integration and maintenance of systems that form part of an organisation and will result in the provision of the right environment to aid the efficiency of the organisation/business and at the same time provide a pleasant environment for the users/occupants of the facility in order to improve their performance.
A facility in the context of this research is a space where users carry out routine activities (most often related activities) for the purpose of achieving individual, collective or organisational goals. It is also a space that triggers social bonds between its users (Best et al., 2003).

The study is being undertaken on the environmental management component of FM practice (Table 2.2) focusing on SWM. The focus here is on the attitudes of the users of this facility towards waste in terms of handling and disposal. Literature on SWM practices will be presented and discussed in chapter 4 of this thesis.

2.6.1. Context of the Study

As already stated, the research is undertaken in the FM context and the MPE is considered as the ‘facility’. The study focuses on the tenth FM functional area (Table 2.2) of competence provided by the BIFM. Within this FM functional area, the key component being studied is SWM, which is an aspect of the environmental management component. The primary purpose of focusing on solid waste is that environmental management theme is a reoccurring issue in this facility with SWM of major concern. The management of this facility is faced with SWM challenge and they are unable to keep up with the responsibility of providing a safe and clean MPE (Ogeah and Omofonmwan, 2013). The inadequate management of solid waste hinges on the lack of adequate solid waste infrastructure and the attitude of the users of the facility towards waste (Balogun, 2012). Being a focal point of the society, the facility commands a large number of users, thus this also poses serious hygienic, public health and environmental concerns.

In the management of a facility, FM methodology provides that the facilities manager has a clear understanding of the core business, culture and environment in which the business exist in order to develop an appropriate strategy (Atkin and Brooks, 2014). Thus, for the MPE, this study argues for an understanding of the dynamics of the marketplace in order to adequately address SWM concerns. To enable an understanding of the MPE in the FM context, a conceptual model (Figure 2.1 and 2.3) was developed for this study. The model guided the empirical phase of the research in establishing an in-depth
understanding of the four components of the MPE (as depicted in the model), and the inputs and expected outputs within the MPE.

Based on what has been discussed in this chapter, the next chapter provides discussions on urban marketplaces across Europe and Africa with particular focus on the history, development and functions of urban markets in African settings.
Chapter 3. Understanding Urban Marketplaces

3.1. Introduction

This chapter focuses on contextualising urban marketplaces in order to provide fundamental understanding of urban marketplace settings and operations. Research has indicated that the MPE has significant influence on the society generally in the African setting. However, not much has been documented regarding the dynamics of the MPE in relation to SWM practices.

It is tradition that every community in Africa has a market (Jerome and Ogunkola, 2000). The size of the community further determines the number of markets. For instance, there are 10 authorised markets in Port Harcourt City (Field Notes, 2014). Besides other factors, markets are set up primarily in order to address the developmental objective of creating wealth and employment (Nwosu, 2008; Oke et al., 2011). This is reflected in the study by (Ogeah and Omofonmwan, 2013).

This chapter thus reveals the details of the market generally, initially in Europe and then in Africa specifically, in order to establish an understanding of what is known about MPEs. Ultimately, this chapter introduces the challenges of SWM and highlights knowledge gaps in the management of solid waste within the MPE. The chapter concludes by justifying the need to study SWM in marketplaces, revealing some key themes to be investigated in the course of the empirical phase of the research.

3.2. The settings and Dynamics of Urban Marketplaces

The marketplace is considered an important feature of daily life and the centre of the community in developing countries, especially in Africa (Mukherjee and Kumar, 2007). According to Smelser and Baltes (2001), cities and marketplaces have sustained each other throughout history; the location, demand and social context is provided by cities for the marketplace while the marketplace provides sustenance, profit and cultural life to cities. It is an epitome of a special type of urban facility because it allows all users the actual experience of the features of a public facility; central, shared and sociable (Unlu-Yucesoy, 2013). This implies that not all public facilities share these features and are accessible to everyone. For example, military facilities as public facilities are not accessible to everyone.
and thus it could be described as a closed facility. The MPE as a public facility allows accessibility to everyone, it is a place where its users actually experience the features of a public space, and it can thus be studied as an open facility, meaningful to social interactions.

A marketplace can be defined as a location where people converge either periodically or daily at an appointed time to buy and sell (Morales, 2011). In other words, the distinct features of a marketplace would be a location, merchandise, appointed time, buyers and sellers.

Markets differ according to their periodicity, the goods and services being traded, location and size (Hill, 1963; Ehinmowo and Ibitoye, 2010). This means markets could be daily - morning, full day, night, or periodic - once or twice in a week or month, or seasonal, for example Christmas. There are different types/names of markets; this depends on the goods available at that particular market. The different market types/names may include; street markets (both official and unofficial), urban markets, farmers’ markets, flea markets, craft markets, livestock markets, fruit markets. According to Wilhelm (1997), most urban markets are multipurpose/mixed markets in that, a variety of goods are sold; this may include – vegetables, food stuff, livestock, hair extensions and accessories, clothes, fruits, stationery.

Economic perspectives of the marketplace do not tell the whole story, however. Storr (2008) describes the marketplace as a scene where commercial and non-commercial relations develop and an arena where meaningful conversations can occur; conversations that are not trade negotiations. For instance, health, environmental, and political rallies, or conversation between market participants. Storr (2008) further posits that if markets did not exist, a variety of such meaningful social relations buttressed by the marketplace would be absent. It can be argued that such meaningful social relations could occur elsewhere for example in pubs, or social clubs. However, based on the distinct feature of markets, it allows a demographic mix, to meet and participate within the market settings.

Marketplaces are usually analysed as either economic entities or sites for social interaction (Jerome and Ogunkola, 2000; Smelser and Baltes, 2001; Watson and
The analysis of marketplaces as sites for social interaction has led to studies of markets as social institutions with hierarchies, complex interpersonal roles and social objectives (Nezic and Kerr, 1996). However, the MPE is seldom analysed as a facility that needs appropriate management (especially in the African setting) in order for its users to have a pleasant and convenient experience while in use of the facility. This is the focus of this study.

Being a focal point of the African society, the MPE has increasingly raised cause for concern based on the problematic issues resulting from the use of market spaces. These issues range from human and vehicular traffic, poor sanitary conditions and SWM challenges, and markets spilling into motorways (World Bank, 2009a; Balogun, 2012; Taiwo and Ajayi, 2013; Omoegun, 2015). Despite these challenges and concerns, there is a paucity of research on the management of markets or on how ‘best’ to address these issues in the use of market space. This study thus focuses on one problematic concern associated with the use of market spaces: SWM.

Currently, the literature review considers selected markets based on their efficient urban marketplace practices (specifically social and economic). It is understood that other areas in the world for example, the USA, Malaysia, and Singapore also have practices that are worth emulating. However, these are not discussed in this study and can be investigated further in future research (see Chapter 9: Section 9.6).

3.2.1. Urban Marketplaces in Europe

Although marketplaces have mostly been overtaken by indoor shopping malls in Europe, outdoor markets are still commonplace across Europe (Zasada, 2009; Gonzalez and Waley, 2013).

In France, shopping at marketplaces still seems to be a norm to this day and it is alleged that there exist over 35,000 urban marketplaces (mostly mixed markets). These comprise both periodic, seasonal (Christmas, tourist season usually July/August, particular seasonal product), and daily markets (Smith, 2006). Responses from customers and vendors gained through interview research
attests to the fact that shopping at French marketplaces is preferred over shopping malls or groceries stores (Smith, 2006), as the French marketplace is perceived as less constraining and more personal (Lindenfeld, 1990); ostensibly, it is a site of social interaction as well as economic exchange.

The settings of French markets are (Picture 3.1) usually either open air markets with temporary stores set up by vendors or shops with carts set up in front of narrow long streets and a majority of French markets operate in the mornings (usually at 9am) until mid-day (Farstrider.Net, 2013). Apart from the fresh products on display, hawkers, artisans and craftsmen, the French marketplace also offers social activities as artists can be seen around stores playing music and small gatherings of people can be seen listening to and singing along (Smith, 2006).

**Picture 3.1:** Settings of a Typical French Market.

The centrality of the marketplace to everyday life in France has also been referred to as an aspect of the French national imaginary. Eckstein (2010), for instance, has described the French marketplace as an epitome of the unique character of France “there’s something special about a French Market; somehow it epitomises much of what goes to create the unique character of France – the lack of haste,
the gentle friendliness of the people who live here and, above all, an abundance of great produce”. This description is as a result of the friendly environment, the people, and the abundance of great products.

In the transcontinental country of Turkey, marketplaces presently are under threat, closed down and replaced with malls and other private real estate projects in a bid to ‘clean up’ cities by the Government (Janssens, 2013a). This is as a result of urbanisation which has made urban space more valuable and given rise to urban transformation projects (Terzi et al., 2006; Aksoy, 2009).

The number of markets held daily in Turkey is estimated at 550 with about 50 taking place at Istanbul (Öz and Eder, 2012). Istanbul is the largest city in Turkey and is famously known for its periodic markets, some of which have existed since the Ottoman era – 1299 (Topcu, 2006). Even with the advent of luxurious shopping malls, supermarkets and tele- or online shopping, the marketplace (usually referred as the bazaars) is still a part of traditional life and culture in Turkey (Tokatli and Boyaci, 1999). A majority of the marketplaces offer a variety of mixed products in open air settings of shared tent-like covers tied to poles (Picture 3.2) and typically operates for almost 24 hours – 2am until 11pm - except for a few for which the local authority has fixed a closing time (Öz and Eder, 2012; Janssens, 2013a).
A study of two major marketplaces in Istanbul by Dokmeci et al. (2006) revealed that, apart from the products on offer for sale, the loud calling of sellers to shoppers and the bargaining, the marketplace is a medium for social interaction and meeting/creating friendship, as it brings together persons who would not have had the opportunity to meet. Dokmeci et al. (2006), however further state that despite the economic and social advantages of the marketplace, noise, waste pollution, traffic congestion and lack of parking spaces are amongst the complaints associated with Istanbul’s marketplaces, especially periodic markets.

Although markets are a part of life and culture in Turkey, the work of Öz and Eder (2012) suggests that, as a result of urbanisation, urban space seem to be highly valued with rising real estate demand and prices, thus making real estate investment lucrative as the fee paid by store holders are insufficient compared to the value of the urban space. There is thus pressure on land use change. Also, based on the complaints associated with marketplaces it has become important to downsize or relocate these marketplaces in order for the local authority to derive economic value for the urban space.

In England, the prominent role of marketplaces as social institutions can be traced to the medieval era - between 1200 and 1500 - when Kings, Sheriffs and religious
leaders took advantage of the large population of people while markets were in session to carry out both civil and ecclesiastical punishments, to disseminate news on politics, changes in routine governmental business, and publicise initiatives that required broad participation to succeed (Masschaele, 2002; Postles, 2004). Griffin (2002) also renders account on how the English marketplace in the late seventeenth century acted as mediums for both recreational and civic uses. These activities included bull-baiting, election ceremonies, pope-burning ceremonies. According to Griffin (2002), the marketplace was an important communal space with cultural significance until the restoration that saw markets being confined to only traffic and trade activities.

Over the past 20 years, the fortune of markets in the UK has fluctuated. Some markets have been under threat, closed down or resituated; their business affected by the development of shopping malls in neighbouring vicinities. This is a global trend and can be attributed to economic restructuring, decline in number of traders and shoppers at marketplaces amongst others (Watson and Studdert, 2006). However, more recently, it has been reported that UK marketplaces are undergoing a renaissance, with continental and farmers markets catering for new consumer demands and lifestyle choices (Young, 2011; Spiller, 2012).

The setting of the existing 2,105 marketplaces (1,124 traditional retail markets – outdoor markets offering mixed products and usually referred to as street markets; 605 farmer’s markets – markets selling only fresh locally grown produce, 350 country markets, 26 wholesale markets) in the UK are a combination of indoor and outdoor markets of 20 to 200 stores with a majority of them open for business every day of the week except Sundays and offering a variety of products ranging from fruits, vegetables, jewelleries, clothing and household accessories (Watson and Studdert, 2006; Zasada, 2009; Regeneris Consulting, 2010) (see Picture 3.3 and 3.4). The common forms of market management in the UK includes; local authority run markets, privately operated markets, partnership in the form of joint venture or contracted out operational management (Zasada, 2009).
Besides the economic relevance of UK marketplaces, UK marketplaces are also analysed as spaces where social interaction occurs. A study on eight markets...
(metropolitan, urban and rural markets) in the UK by Watson (2009) on the potentials of markets as public space where multiple forms of social events are established revealed that, the marketplace represents a significant public and social space for vibrant social encounters between shoppers, shoppers and traders, amongst traders, and care for others – traders keeping an eye on their customers. Other social events that occur at the marketplace include, persons singing, promotion of events such as trade fairs, Olympics and Jubilee celebrations (NABMA, 2013a).

Markets have also been considered as an essential component to urban regeneration schemes. In the review of high streets in the UK, Portas (2011) states that one unique way to bring a town to life is by setting up marketplaces. Portas (2011) further describes the marketplace not only as a site to buy and sell but also as a place to meet, share, discover and enjoy people’s company. This review sparked up the 2012 ‘Love Your Local Market’ (LYLM) initiative led by the National Association of British Market Authorities (NABMA) which is presently an annual event encouraging people to come out and support the growth of the marketplace and local businesses and showcasing what the market has to offer thereby gradually re-establishing this vibrant space - marketplace as the heart of the community (NABMA, 2013b).

Based on the foregoing, although there are historical changes to the role of marketplaces in the UK - from the medieval era to today - the UK is rediscovering the potential of markets as social and commercial spaces.

To ensure successful market operations in the management of UK marketplaces, one of the critical success factors is good management and this entails good decision making, effective communication, business acumen and the provision of a safe and clean environment (Zasada, 2009). To help achieve market success, NABMA provides training for market managers to ensure successful markets in the UK.

Amongst other countries in Europe, marketplaces are also common in Italy and Spain. The Porta Palazzo market (Picture 3.5) in Turin, Italy, offers a mixed product open air market (which operates six days in a week - Monday to Saturday) and is currently the largest open air market in Europe and receives
about 40,000 visitors daily and 100,000 visitors on Saturdays (Avedano, 2013). The market which operates all day except for an hour (between 7pm and 8pm) covers a total area of 51,300 square metres and has four major sections – farmer’s market, fish market, clothing market, flea market referred to as ‘Balon’ with areas for the sale of meat, dairy and household goods between the four sections (Black, 2012; Formicola and Portinaro, 2012). Besides the variety of products, the overwhelming noise - especially the loud voices of the vendors competing to get the attention of buyers and movements, children running around and playing, the bustling, various artists playing instruments and singing - the Porta Palazzo marketplace is a place to meet and make friends and an integral part of the daily lives of the people. Like the other European markets mentioned above, it too is an important commercial and social space (Black, 2012). One distinct feature of the Porta Palazzo market is that banks, post office, and doctor’s offices are amongst other services that could be found on this space and this makes it quite different from other marketplaces (Tessore, 2009).

Picture 3.5: Porta Palazzo market in Turin, Italy
Source: Avedano (2013).

In Barcelona, which is the second largest city in Spain, the marketplace is the driver of social life and economic strength and they operate six days in a week – Monday to Saturday (Janssens, 2013b). In order to keep up with the challenges
of the 21st century in terms of infrastructure, facilities, customer services and retain the role of the marketplace, Barcelona’s 43 municipal covered markets (39 food markets and 4 speciality markets) which is owned by the city council and being managed by the Institute of Municipal Markets (IMMB) are being remodelled – modernised and renewed (Costa, 2013). Costa (2013) further states that the marketplace plays a major role in city life by vitalising the city and receives about 63 million visitors annually, thus by remodelling the marketplace the city is being transformed and the market maintains their role as drivers of social and economic vitality. A typical market in Barcelona is represented in Picture 3.6.

Picture 3.6: Abaceria Central Market, Barcelona
Source: Mercats de Barcelona (2010).

One of the core values in the management of Barcelona markets is the provision of a pleasant, safe and clean trading environment (Ajuntament de Barcelona, 2015). Also, in the management of waste, a waste separation plan was launched and recycling is promoted in the markets.

The research on Barcelona’s marketplace suggests that the marketplace is central in Barcelona, thus the need for remodelling in order for the marketplaces to remain relevant and keep up with the challenges of the 21st century - in terms of infrastructure, facilities, and customer service.
From the above, urban marketplaces in Europe seem to exhibit similar characteristics – majority of them offer mixed products, a space for economic activity and social interaction, as well as both covered and uncovered market structures. However, the Porta Palazzo market is quite different in a way as it offers other services such as banking, postal and medical services. European markets however offer both economic (trade, employment, investment) and non-economic (welfare, social interactions, tourism, news) services.

One key strategy employed in the management of Britain and Barcelona markets is adequate FM services especially in terms of providing a pleasant, safe and clean environment for its users. With the redevelopment of markets in Barcelona, the management now offers a more sophisticated FM service in order to safeguard the investments in markets. For example, in a bid to achieve energy efficiency, the management of Barcelona markets installed solar panels that harness the sun’s energy which is then used to heat water (Ajuntament de Barcelona, 2015).

A lesson from markets in Europe is the example set by Barcelona authorities, by remodelling and modernising the marketplace to meet the challenges of the 21st century. Their action is commendable and illustrates the importance attached to the marketplace as most importantly their marketplaces play a major role in vitalising city life. With such initiative, the unique role of the marketplace is maintained for centuries to come.

Although there are other prominent market cultures in Europe, the literature reviewed so far indicates fundamental similarities in market management practice. Furthermore, the literature review has shed light and provided information on a majority of the issues that are of great interest to this study. For example, the dynamics of urban marketplaces, and FM practices in the management of markets.

### 3.2.2. Urban Marketplaces in Africa

The origin of African marketplaces relies on two theories initiated by the work of Hodder (1965). In the first theory, Hodder (1965) suggest that markets originated from barter between individuals and then local exchange within communities and
only a few of these goods resulted in long distance trade. However, the second theory of Hodder (1965) completely refutes the first and suggests that markets in Africa originated from establishing them on trade routes and then local markets developed from these established markets as a network of roads and tracks were developed.

Henrich (2006) traces the history of African marketplaces and its role in the society as far back as 300 AD when animals and people were exchanged in an open-air marketplace. Gradually, the products being traded increased and eventually African marketplaces became centres that housed other social activities apart from buying and selling. Hill (1966) posits that as markets evolved the management and control of marketplaces were vested in Chiefs or individuals who ensured peaceful and honest dealings and they were responsible for the general maintenance and cleanliness of markets including the collection of rents on stores.

Turyahikayo-Rugyema (1976) defines the concept of African marketplace as having three underlying conditions; a defined physical site where buyers and sellers meet to transact business, the gathering must be authorised, and the society predetermines its periodicity. Even with the emergence of departmental stores and supermarkets in developing countries today, urban markets are found in all African cities (Jerome and Ogunkola, 2000; Onyango et al., 2013; Ogeah and Omofonmwan, 2013). One of the fundamental focal points of economic and social life in developing countries especially in Africa is the marketplace because most city dwellers buy a majority of their foodstuffs from the markets and it provides an opportunity for most government programmes such as immunisation programmes, family life education and political campaigns, aimed at educating and reaching out to the public to be conveyed via the marketplace (Hill, 1963; Wambugu, 1995). The marketplace is an enabling environment for government and other organisations to take advantage of the market population – traders, buyers and visitors - to introduce their programmes/products. Marketplaces are thus an important feature of African societies and can therefore be viewed as the nucleus of development as they have economic, social, political and cultural importance and are the focus of a range of activities and functions on these bases.
African markets are classified into five major types based on their location and periodicity; urban daily markets (which is the focus of this study), urban night markets, rural daily markets, rural periodic night markets, and rural periodic day markets (Udo, 1982). Most urban markets operate daily from sunrise to sunset, cover a large land mass, serve a large geographical area, noisy, congested and usually command a large gathering of people – say between 50,000 to over 100,000 daily depending on the size of the market (Jerome and Ogunkola, 2000). The price of goods is not fixed and is mostly dependent on the bargaining skills, demand and supply and the time of the day (Ogeah and Omofonmwan, 2013). Goods, especially perishables, tend to be cheaper in the evenings as traders are expected to sell fresh goods in the mornings.

The design and setting of African urban markets as shown in Picture 3.7 and 3.8, are either a combination of lock-up shops divided into various sections, makeshift structures with wooden frame covered with corrugated iron sheets, open space, or building on multiply floors (Oloto and Adebayo, 2011).

Picture 3.7: Makola Market, Accra, Ghana.
Urban market activities are carried out in both formal and informal settings. The former are carried out in authorised locations usually under the control of the LGC and operates on a daily basis with exception of Sundays, while the latter are not recognised by the Government (Langyintuo et al., 2003), and includes uncontrolled trading through street trading and hawking, and night markets (Adelaja, 2014; Omoegun, 2015). The emergence of informal markets increases the problematic issues associated with trading: human and vehicular traffic, obstruction in motorways as a result of the market spilling unto roads, and the indiscriminate dumping of waste (Falola and Salm, 2004; Adelaja, 2014).

In Africa, local authorities are usually responsible for the management of markets – they allocate and collect rent on stores and fees for the management of the marketplace (Onyango et al., 2013). However, literature suggests that the management of markets is marred by poorly trained and corrupt officials resulting in the poor management of markets, especially with issues to do with market sanitation, market structures, financial management and congestion of markets (Porter et al., 2010; Abejegah et al., 2013; Taiwo and Ajayi, 2013). It is also common for most markets to have a traders’ association. The role of the traders’ association is mainly in regulating trade, dispute resolution, management of
information and representation in broader consultation (for example with the State or LGC), provision of credit facilities for members and in some cases have control over the allocation of space within the marketplace (Porter et al., 2010). Markets also have commodity associations who are the first contact in terms of dispute resolution or in settling minor disputes between users of the market, they also regulate trade activities by ensuring their members adhere to the agreed fixed price for commodities (Hill, 1963; Porter et al., 2010).

Besides trading, African marketplaces provide other functions. People meet at the marketplace in Africa based on their religion for various reasons; settling of dispute, meeting friends and kinsmen, catching up on the latest news, exchanging of ideas, learning, religious activities, traditional festivals, political activities including social gathering (Nelson, 1998; Henrich, 2006). Based on their distinct and unique composition, the African marketplace is viewed as a heritage and part of the heartbeat of African societies (Daily Independent, 2013).

Unlike social events at European marketplaces, African marketplaces offer much more in terms of activities that take place at the marketplace and this makes it a unique space in African societies. For instance, apart from interactions between traders and shoppers, amongst other events, the marketplace is a target for most companies to introduce or advertise their products or programmes, which include various health, political, social and religious programmes. For instance, the United States Public Health Service Smallpox Eradication Programme in Mali Republic and family planning awareness (Imperato, 1969; Ladipo et al., 1990). The success of the United States Public Health Service Smallpox Eradication Programme in Mali Republic was as a result of a change in strategy – from village-to-village vaccination to include vaccination of the populace at barricade points before they enter the market. This was important in order to reach the nomads and traders, a target population that is highly mobile.

Jerome and Ogunkola (2000) further affirm that the interaction that occurs at African marketplaces – repeated dealings between vendors and buyers that lead to personal loyalty and friendship - plays a significant role in the behaviour of market participants. This invariably implies that each party (trader and buyer)
could have a significant influence on the other based on the friendship made on issues not necessarily regarding trade.

The ability of the African marketplace to reach out to women and men of all ages and social status is incomparable (Ladipo et al., 1990). This position is ascertained based on the large gathering the marketplace attracts since majority of urban dwellers buy their household needs from the market. As a result of the large gathering, it is used as a conduit for information dissemination and it is believed information passed via the marketplace will also be accessed by people outside the MPE. For instance, based on the social classification of people in a society especially in Africa, a majority of those in the upper class might not be seen at marketplaces because they have domestic staff that are responsible for daily and smooth operation of the house. These domestic staff in one way or the other relate their findings at the marketplace to their employers, thus the employers do not necessarily need to visit the marketplace to be aware of the happenings at the marketplace. This confirms the suppositions of Ladipo et al. (1990) that it would be rare to find an African who did not in one way or another participate in market life.

Based on the opportunities presented by the MPE, Watson and Studdert (2006) argues that the marketplace has the potential to play a key role in addressing policy agendas. Morales (2009) also posit that the marketplace plays a role in addressing health, political, social, ecological and environmental concerns.

Wambugu (1995) suggests that, if the marketplace is stabilised with the necessary services and facilities, the government, and other groups can take advantage of the congregation of people to introduce more innovations, policies and programmes that will aid in achieving developmental objectives. This suggests that the marketplace is not being used to its full potential as a result of poor infrastructure and inadequate management of its environment. However, the research did not categorically state what services and facilities should be provided and how these innovations can be introduced. The Rivers State Government however, in 2013 remodelled two of its traditional old markets providing them with modern facilities (Barasimeye, 2013). Details of the remodelling are provided in Chapter 6.
There is no doubt that the African marketplace offers opportunity for introducing innovation and programmes. A typical example and successful account is the United States Public Health Service Smallpox Eradication Programme in Mali. The success of this programme was based on the discovery that the marketplace offered the most convenient and effective medium for ensuring high vaccination coverage of the population (Imperato, 1969). With the volume of noise emitted at marketplaces from traders trying to outdo one another in seeking the attention of a prospective customer/buyer, loud music coming from stores trying to promote the sale of their stock, the hustling of hawkers and visitors, the exposed spices that could upset nostrils and the eyes, the African marketplace is not necessarily the most convenient environment. Also, positioning and trying to gain the attention of the traders at their moment of maximum anxiety when they are negotiating or trying to conclude transactions is quite inconveniencing and uncomfortable (Hill, 1963). However, notions of convenience are better applied to the target audience that visit the marketplace daily. The traders most of whom are women, spend long hours every other day of the week in the market, most times accompanied by their children (Nezic and Kerr, 1996). This makes the marketplace a convenient and effective medium to carry out such immunisation programme.

An operations research by Ladipo et al. (1990) in Ibadan, Nigeria, investigating the feasibility of a contraceptive distribution system by using traders (trained) in the market to sell contraceptives confirmed, markets are potential channels for the distribution of contraceptives based on their ability to reach out to women and men of all ages and social status. An important finding of the research is that the traders made additional effort by taking the contraceptives home to sell to family and neighbours. The Community Based Distribution (CBD) model, which was the concept of the delivery system of the research, was adopted and is being tested in other Nigerian cities and Accra, Ghana.

It might be argued that the additional effort put in by the traders by taking the products home to family and neighbours was influenced by the profit they would derive if the entire product in their possession were sold out. However, it is important not to overlook the fundamental potential and opportunity the marketplace presents; it is an avenue to reach out to the populace and introduce
new programmes and innovation. Also, the success of the programme illustrates that programmes introduced via the marketplace has the probability of reaching out to other institutions/organisations (family, office) and the society at large.

The successes and findings of the aforementioned research are quite interesting and confirm the role of the marketplace in achieving developmental and other objectives. The successes of these programmes reveal the significance of adopting the right strategy in addressing concerns via the marketplace. This presents the need to adopt the right strategy in order to take advantage of the opportunities the marketplace presents in addressing SWM practices in marketplaces.

Evidence on research on African marketplaces suggest that a majority of marketplace research centres on the origin, periodicity and expansion of African marketplaces, the distribution of marketplaces, social and economic impacts of markets (Hill, 1966; Good, 1973; Smith, 1979; Jerome and Ogunkola, 2000). Only a few research projects have been carried out on how the marketplace can be viewed as an opportunity to accomplish developmental policies, objectives and introduce innovations (Ladipo et al., 1990; Ogeah and Omofonmwan, 2013; Asomani-Boateng, 2015). The study by Ladipo et al. (1990) revealed that the marketplace can act as sites for the distribution of contraceptives based on the ability of markets to reach women and men of all ages and social status. Ogeah and Omofonmwan (2013) reveals that despite the various problems encountered in the use of market space – poor management, frequent fire outbreaks – the market provides employment to a majority of the populace. The study by Asomani-Boateng (2015) reveals how the adoption of a participatory and inclusive approach to managing waste in markets can effect better waste management systems in markets. However, there is still a paucity of contemporary literature that provides detailed understanding of the marketplace in the African setting with particular reference to SWM.

3.3. Understanding Culture and Practices within the Marketplace

In undertaking this study, it was important to observe the everyday culture of marketplaces particularly regarding waste. This will reveal the assumptions made towards SWM practices of market users and redefine how we know what we
know about SWM practices in MPEs. According to Inglis (2005, p.7) “culture comprises the patterns of ideas, values and beliefs common to a particular group of people, their ‘characteristic’ ways of thinking and feeling”. It thus refers to the distinct way or manner people within a social system act and think. Gudeman (2001, p.11) captures the everyday culture of the marketplace by noting:

“No trade or market system exists without the support of communal agreements, such as shared languages, mutual ways of interacting, and implicit understandings”.

Gudeman (2001) suggests that despite the attendant characteristic of traders trying to usurp one another in the everyday use of the marketplace, the market users tend to exhibit certain ideas, beliefs, norms and tacit understanding and this forms the characteristics of the market. Some of these practices are identified in the genuine friendship cultivated in the market, the looking out for one another, caring for children, the implicit understanding of the practices to be undertaken within the marketplace, and the trust enshrined in the use of the space (Clark, 1994; Gudeman, 2001; Storr, 2008).

Schein (2010) analysed culture at different levels based on the degree to which the cultural phenomenon is visible to an observer as depicted in Figure 3.1.

The Artefacts is the most visible level that relates to the structure and processes and observable behaviour. However, inasmuch as the behaviour is observable at this level, it is somewhat difficult to interpret by outsiders (Schein, 2010).
Figure 3.1: Demonstration of Culture at Different Levels
After Hofstede (2001) and (Schein, 2010).

For the marketplace, the visible structure and processes would be typically the congested and noisy environment, the old and dilapidated structures, the presence of traders’ and commodity associations (Hill, 1963; Jerome and Ogunkola, 2000; Porter et al., 2010). Also, the staging of goods, haggling, no scales for measurements, the layout of markets in sections, and the presence of solid waste littered and dumped within the MPE are visible structures (Ikioda, 2012; Ogeah and Omofonmwan, 2013; Taiwo and Ajayi, 2013). Schein (2010) however states that in order to understand and interpret this observable level, it is important to consider the values of the system, which is masked by espoused beliefs, and values.

The espoused beliefs and values are the rationalisation people make regarding their norms and how they think; the rules, standards and prohibitions (Schein, 2010). Owing to these espoused beliefs and values, they rationalise their actions and thinking in specific ways over others (Hofstede, 2001). However, in actual fact, these values are based on underlying assumptions. Schein (2010) proposes that in order to have adequate understanding of these beliefs it is important to have an understanding of the basic underlying assumptions that underpin these beliefs. Schein (1984) describes the basic underlying assumptions as the unconscious and taken-for-granted beliefs and values that shape the thoughts, perception and feelings of a group. In essence, the everyday routine and
practices of a group is shaped by concealed values that translate to the behaviour of the group and this result in assumptions as to how things are done.

One of the key areas investigated during the empirical phase of this study is the underlying assumptions in relation to SWM practices. In observing the cases for this study, these levels of culture were considered in order to give meaning to the use of market space and SWM practices of the market users.

3.4. African Urban Marketplace Stakeholders

It is the functioning of the urban marketplace that makes it an influential part of the society. This is directly centred on the various activities carried out by the stakeholders. Without the various role and activities of the stakeholders (buying, selling, social and religious meetings, etc) at the marketplace, the marketplace can be likened to any other building that houses activities (offices, homes).

Stakeholders have been defined by various authors most often in the context in which it is being studied (Savage et al., 1991; Wicks et al., 1994; Clarkson, 1995; Bryson, 2004; Bourne, 2005; Wetherly and Otter, 2011). For this study, the definition by Carroll and Nasi (1997) is adopted. Thus, marketplace stakeholders are individuals or groups who affect or are affected by marketplace operations, practices or activities. This definition is most appropriate as it covers a broader group and it takes into account every individual/group irrespective of their level of influence or relevance. This gives rise to one of the typical classification of stakeholders into two main categories; primary and secondary stakeholders (Clarkson, 1995). Drawing from Clarkson (1995) classification of stakeholders, the primary stakeholders are the core actors in the marketplace, the existence and functioning of the marketplace is dependent on their actions whereas the secondary stakeholders are those that could influence or be influenced by the functioning of the marketplace.

Using a literature review, the study put together in Table 3.1 the various stakeholders, their respective roles and classification. This is important as it identifies the primary actors in the MPE and their role regarding SWM practices.
### Table 3.1: Identified Stakeholders, their Role and Classification in Urban Marketplaces

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Role</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buyers</td>
<td>These are individuals or group of persons that come into the facility to make purchases.</td>
<td>Primary</td>
</tr>
<tr>
<td>Carriers</td>
<td>They are manual labourers who load, carry and offload already purchased goods for traders and buyers for an agreed amount to specific locations (Hill, 1963; Balogun, 2012)</td>
<td>Primary</td>
</tr>
<tr>
<td>Commodity Association</td>
<td>They are a trader body that ensure traders adhere to prices fix on goods and also look out for the welfare of their members including members' social functions (Hill, 1963).</td>
<td>Primary</td>
</tr>
<tr>
<td>Entertainers</td>
<td>These are individuals or group of persons that carry out some form of entertainment at the marketplace. Examples; singers, dancers, performers.</td>
<td>Secondary</td>
</tr>
<tr>
<td>Local Government Council (LGC)</td>
<td>They are usually responsible for the management of urban markets; they allocate and collect rent on stores, collect operational and maintenance levy, maintain law and order, and ensure proper sanitary conditions including SWM in markets (Onyango et al., 2013; Ogeah and Omofonmwan, 2013). Based on their role and responsibilities, they assume the role of the facilities manager in marketplaces.</td>
<td>Primary</td>
</tr>
<tr>
<td>Market Council</td>
<td>They are group of traders elected by the traders based on their age and number of years in the market. They offer advice to the market management on market operations and welfare of traders (Balogun, 2012).</td>
<td>Primary</td>
</tr>
<tr>
<td>Police</td>
<td>The State Government issues police post are sited in or close to marketplaces to maintain law and order (Onyango et al., 2013).</td>
<td>Secondary</td>
</tr>
</tbody>
</table>
Table 3.1: Identified Stakeholders, their Role and Classification in Urban Marketplaces (Cont'D)

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Role</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitisation</td>
<td>Are individuals or groups that use the marketplace to introduce their products, programmes or educate the users on particular issues. Example of such groups includes health organisations, religious bodies, and political groups.</td>
<td>Secondary</td>
</tr>
<tr>
<td>Group(s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service Providers</td>
<td>They offer services that support the functioning of the MPE. Example of such services includes, cleaning and SWM services.</td>
<td>Primary</td>
</tr>
<tr>
<td>State Government</td>
<td>Provides the enabling environment for the functioning of urban markets for instance, security in the form of Police for the maintenance of law and order, infrastructure, etc (Ogeah and Omofonmwan, 2013).</td>
<td>Primary</td>
</tr>
<tr>
<td>Suppliers of Goods</td>
<td>They provide most traders with the goods they display for retailing (Hill, 1963).</td>
<td>Primary</td>
</tr>
<tr>
<td>Traders Association</td>
<td>They are likened to the visible face of the Local and State Government. They collect, process and disseminate information from the Local and State Government to individual traders as well as settling of disputes amongst traders (Jerome and Ogunkola, 2000). Jerome and Ogunkola (2000) also posit that they facilitate their members’ access to transport and credit facilities and further provides the necessary institution and physical infrastructure where the Government does not.</td>
<td>Primary</td>
</tr>
<tr>
<td>The Community</td>
<td>The community plays the role of housing the marketplace.</td>
<td>Secondary</td>
</tr>
<tr>
<td>Visitors</td>
<td>Are persons who visit the marketplace to meet with friends and next of kin, catch up on the latest news, confirm the price of goods, etc. (Nelson, 1998; Henrich, 2006).</td>
<td>Primary</td>
</tr>
</tbody>
</table>
The activities and interactions of all market stakeholders were incorporated in this study. Primary data reports mainly on the primary stakeholders with particular emphasis on the attitude of the users of the marketplace towards waste. The users in this context refers to those that spend longer hours in the use of the marketplace and whose output as a consequence of their activities in the marketplace results in the generation of waste. These users identified from literature especially based on their role in the marketplace are the traders, and buyers/visitors (Nezic and Kerr, 1996).

3.5. Analysing the Urban Marketplace as a Facility

For the purpose of this study, drawing on the definition and discussions in Chapter 2, a facility is a space where users carry out routine activities (most often related activities) in order to achieve individual, collective or organisational goals. The users of the MPE carry out related activities in order to achieve individual, collective and organisational goals. An individual goal here may refer to the objective of individual traders which most often is to make sales, meet customer’s needs and make profit or a buyer whose objective is to be able to purchase all the goods they visited the market for in due time and at a favourable price. The collective goals here could refer to individual traders striving to meet the goal of their respective commodity associations whereas the organisational goal would refer to achieving the overall purpose of setting up marketplaces.

A facility is defined by four main components (Section 2.4) and these components were established as; the people, the business, the buildings and infrastructure, and the business support services. A facility is also a space that triggers social bonds between its users (Best et al., 2003). Literature has established that the marketplace is an arena where social relations develop and meaningful conversations not related to trade negotiations occur (Storr, 2008).

Based on the above, it can be deduced that the MPE exhibits the characteristic features of a facility. The four main components that define a facility as already identified are components that enable the functioning of the MPE for the purpose for which it was set up. Thus, the MPE could be analysed as a facility.
Also, with reference to Section 2.5, the MPE exhibits the characteristics of a system as defined by Ackoff (1981) based on the following;

1. It has more than one component and these components are interrelated and enable the functioning of the MPE as whole; the people, business, infrastructure and services.

2. Each component of the MPE is affected by at least one other component. For instance, the MPE will only be a space and cannot function without people or the business component.

3. Also, subgroups of components have the first two properties. For example, the people at the marketplace include buyers, sellers and visitors and the functioning of the sellers depends on the buyers, thus the subgroups also exhibit the third characteristics of Ackoff’s definition.

The various components of the MPE as conceptualised from reviewed literature are described below;

- **People:** With reference to the definition of Pemsel et al. (2010), this refers to the users of the MPE. These are persons or group of persons that carry out individual and related activities in the facility irrespective of their stakeholder category; whether primary or secondary stakeholders. They are in contact with the facility either by way of carrying out the primary activity for which the facility was set up or offering supportive services that enable the functioning of the MPE or the use of the space to carry out other activities not necessarily related to the primary activity.

- **Business:** Based on literature reviewed, urban marketplaces in Nigeria are usually built and provided for the populace by the State in order to meet the developmental objectives of creating wealth and employment (Nwosu, 2008; Oke et al., 2011). The State Government then hands over the ownership and management of the markets to the Local authorities (Jerome and Ogunkola, 2000; Porter et al., 2004). The stores are let out by the Local Government Council (LGC) to the prospective traders at a monthly minimum fee. Thus, the actions of the State in providing the urban marketplace structure and facility can arguably be viewed as an
investment with both tangible and intangible returns. This is so because in this case, the return on investment is not mainly monetary; the State expects that the marketplace structure and facilities are maintained in such a way that it continually serves the purpose for which it was built for. The focus of the Government is to ensure this space attracts traders and prospective buyers at all times, in so doing people remain employed and wealth is created.

On the other hand, the main focus of the traders is retail which invariably is the core business of the retailers. Thus, in line with the views of Musa and Pitt (2009), the core business of the urban marketplace is investment and retail. However, this study focuses on the primary activity of the users of the MPE which is retail.

- **Buildings, Facilities and Infrastructure:** These are the physical structures and facilities that facilitate the functioning of the MPE. They enhance the shopping experience of the users of the MPE. The identified infrastructure and facilities in MPE from literature is presented in table 3.2.

<table>
<thead>
<tr>
<th>Author</th>
<th>Identified Infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oloto and Adebayo (2011)</td>
<td>Lock-up shops, make shift structure (temporary – corrugated iron sheets on wooden frame)</td>
</tr>
<tr>
<td>Balogun (2012)</td>
<td>Drains**, external road, dispensary, internal road* (within the market), private mosque, toilet** (Pit), water* (borehole), waste receptacle*.</td>
</tr>
</tbody>
</table>

**Note:** *Not all markets*, *Poor condition.*

Table 3.2 reveals that a majority of urban markets are characterised by poor infrastructure and sanitary conditions. According to Uzuegbunam (2012) the issues of poor infrastructure and sanitary conditions are as a result of lack of planning. Uzuegbunam (2012) further stated that markets
are allowed to grow without a laid out plan and the resultant effect is the pressure on existing facilities which results in a breakdown of infrastructure.

- **Business support services:** These are actions or activities required to maintain the physical structure, facilities and space within the MPE. They are services provided to aid the functioning of the MPE in order to achieve a pleasant, safe and convenient environment. Although not adequate, the services identified from literature includes; administration and management, space allocation, space renting, building maintenance, cleaning, waste disposal and environmental management, security, and records management.

- **Input:** These are the themes that flow into the MPE from the environment and results in the interaction between the MPE and the external environment. The inputs identified from literature are;

  - **Goods and services:** This is a fundamental feature in the functioning of the MPE and forms one of the key components of the MPE – the business. Also, a typical example of services rendered in this facility is medical activities. The MPE serves as an avenue to carry out practical medical programmes. A typical recorded example is the United States Public Health Service Smallpox Eradication Programme in Mali Republic and family planning awareness (Imperato, 1969; Ladipo et al., 1990).

  - **Information:** Literature reveals that the African MPE serves as a conduit for information dissemination and awareness (Nelson, 1998; Henrich, 2006; Onyango et al., 2013). Political, social, religious, health and organisations use the marketplace to introduce their products and programmes.

  - **Money:** One of the reasons the market is analysed as an economic institution is based on the exchange of goods and services in this place which results in growth and development of the community in which it exists in. And the legal instrument accepted for the
payments of such goods and services is money. Thus, the inflow of money into this system (the MPE) is fundamental for the functioning of the MPE.

- **Labour**: Labour is essential for the functioning of the MPE. Labour is employed to carry out physical work or the delivery of services such as carrying of goods.

- **Plant and Machinery**: Plants such as generator set are brought into the MPE to serve as source of electricity.

- **Output**: These are the outgoing themes resulting from the interactions between the MPE and inputs. Those outputs identified from literature are;

  - **Behavioural change**: The work of Jerome and Ogunkola (2000) suggests that the friendship and loyalty that exist between traders and buyers plays a role in the resulting behaviour of either party. Although, there is no literature that categorically states how behaviour is transformed out of the MPE. Arguably, the interactions that occur in the MPE in one way or the other have an effect on the behaviour of the users of this facility. For instance, the introduction of new products can change the consumer's consumption pattern or health programmes can have an effect on initial health behaviour (see Section 6.4).

  - **Goods**: The inflow of goods and services which is a key theme in the functioning of the MPE also results in output of goods. This is one of the core reasons buyers visit the MPE.

  - **Information**: Literature suggests the MPE is a medium to disseminate information as a result of the large gathering it commands. The supposition of Ladipo et al. (1990) on the ability of information disseminated via the African marketplace to reach out to women and men of all ages and social status is based on the findings of their research as the traders made additional efforts in taking the products outside the MPE to introduce to family and neighbours.
- **Money:** Being the legal instrument of trade, it also flows out of the MPE.

- **Pollution:** Solid waste is a reoccurring theme in this facility based on the input and components of the MPE. The waste from this facility is usually inadequately managed, thus constituting environmental pollution (Balogun, 2012). Also, as a result of the large number of people that visit the marketplace coupled with the tactics used by the traders to advertise their products – loud music, screaming at the top of their voice, ringing of bells etc - one of the outputs from the MPE is certainly noise pollution.

- **Feedback:** These are the outputs of the MPE based on the interactions that are fed back into the MPE as input. The outputs of the MPE are fed back into the system. For instance, money is fed back as it is the legal instrument for trade.

- **Environment:** These are the external environmental factors that could affect the functioning of the MPE. The identified external factors from literature include; competition, government policies, suppliers of goods and services, laws and legislations, economic factors, political factors, socio-cultural factors.

### 3.6. Solid Waste Management in Urban Marketplaces

Urban markets are usually under the direct control of the LGC in which they are located and it is their responsibility to allocate stores, collect rent on stores, ensure proper maintenance of the MPE and manage the activities at the MPE (Jerome and Ogunkola, 2000). However, research by Ogeah and Omofonmwan (2013) reveals that despite the fees paid by the traders for the use of space and market sanitation, there is a total neglect on the part of the LGC in their responsibility in the maintenance of markets. This is most evident in the dilapidated market structures, lack of sanitary facilities and the unhygienic and congested environment (Uzuegbunam, 2012).

The issue of market sanitation particularly regarding SWM is one of the greatest challenges faced in the management of markets by the local authorities (Udo,
1982; Bammeke and Sridhar, 1989; Ogeah and Omofonmwan, 2013). However, although marketplace sanitation is a serious problem as it poses serious hygiene and public health concerns, it is an area that lacks research (World Bank, 2009a). In markets, waste is dumped indiscriminately on the ground and in the open drains contributing immensely to environmental degradation, the pollution of the physical environment and poses risk to public health (Olaseha et al., 2005). Picture 3.9 and 3.10 are typical illustrations of indiscriminate dumping of waste in the marketplace.

**Picture 3.9:** Indiscriminate Dumping of Waste in Nigerian Marketplaces
Source: Field notes (2014).
Literature suggests amongst other factors that the inadequate management of solid waste hinges on the lack of adequate solid waste infrastructure and the attitude of the market users towards waste (Balogun, 2012; Asomani-Boateng, 2015). The study by Taiwo and Ajayi (2013) focusing on the SWM practices of traders revealed that the key factors that influence waste disposal attitudes of traders were illiteracy, ignorance, negligence and laziness. However, there is still a lack of literature that defines the factors that underpin these attitudes.

In research that focused on three waste management behaviours – waste reduction, reuse and recycling - Barr (2007) argues that inasmuch as the presence of an effective economic, technical, legal and environmental infrastructure is important, the decisions of individuals especially regarding what to buy, how to use and how to dispose of waste products are fundamental to effectively tackling waste problems. Barr (2007) further argues that it is fundamental to identify and clearly understand the factors that influence the attitudes of individuals/stakeholders in order to have an effective waste management system.
The involvement of stakeholders in developing, analysing or changing a waste management system is crucial to improving and effectively managing solid waste (Klundert and Anschutz, 2001; Olaseha et al., 2005; Lederer et al., 2015; Asomani-Boateng, 2015). Integrated Sustainable Waste Management (ISWM) also recognises the stakeholders as one of the three important dimensions to addressing SWM concerns in low and middle income countries (Scheinberg, 2004). On this basis, it becomes important to investigate the practices, attitudes and behaviour of the stakeholders regarding SWM practices. Thus, in line with these arguments, in order to address SWM practices in marketplaces, there is a need to identify the factors that underpin attitudes and behaviours of market users towards waste.

3.7. Summary and Conclusions

The purpose of this chapter was to provide an understanding of the marketplace settings especially in the African environment. Literature reviewed reveals that markets in Europe and Africa have both social and economic significance. There also exists commonality in terms of remodelling, regeneration and the role marketplaces play in urban life. However, contrary to markets in Europe, literature reveals that the African marketplace is characterised mainly by dilapidated structures, lack of sanitary facilities and an unhygienic and congested environment. The market managers are unable to respond effectively to addressing SWM concerns (Bammeke and Sridhar, 1989; Balogun, 2012; Ogeah and Omofonmwan, 2013). Literature reveals that despite the risk to public health and environmental problems, research on SWM in marketplaces is an area that has been neglected (World Bank, 2009a). This thus forms the relevance of this study and provides a case for the study of SWM practices within the MPE.

There are lessons to be learnt in the management of markets especially in Britain and Barcelona, as the provision of a clean, pleasant and safe environment is a core FM value within their market management. It then suggests that, achieving a clean market in Africa is obtainable but firstly there is a need to understand the practices of the market users towards waste in order to provide the market managers with tools (as regards SWM) to enable MPEs in African settings catch up with standards of markets in developed countries.
Based on reviewed literature, the MPE can be analysed as a facility and there is a need to understand the dynamics of the MPE in order to address SWM concerns. Only a few studies have been undertaken in the understanding of the dynamics of the African marketplace in the context of SWM practices. It is only when there is a clear understanding of the dynamics that the underlying factors that underpin the market users’ attitudes toward waste can be established. This has been undertaken in chapter 6 and 7 by undertaking primary research.

Having reviewed literature on urban marketplaces, the next chapter provides a detailed discussion and understanding of SWM practices with particular focus on Nigeria.
Chapter 4. Municipal Solid Waste Management Practices

4.1. Introduction

The management of solid waste is one of the greatest challenges faced in the management of markets in Africa. However, despite the challenges posed by the inadequate management of solid waste, SWM in African marketplaces is still under-researched. This study argues for an understanding of SWM practices of market users in order to address SWM concerns in marketplaces. This chapter thus provides an in-depth understanding of MSWM particularly as it relates to Nigeria.

The chapter starts with a global concept of the practice of MSWM and then discusses MSWM practice in Africa. Afterwards, a comprehensive overview of MSWM in Nigeria is provided. This includes SWM legislations in Nigeria, approaches to MSWM and MSWM practices from the point of generation to final disposal. The next section provides an understanding of the barriers to effective MSWM in Nigeria with a focus on the attitude of the populace, which is a socio-cultural component. Afterwards the factors that could influence attitudinal change towards various waste management practices were presented highlighting also the factors that could influence attitudinal change in the African settings. An overview of the features of the case study City and the practice of MSWM is presented afterwards highlighting the challenges of MSWM in the case study City. The chapter concludes with a model revealing the range of SWM practices in Nigeria and the knowledge gaps identified throughout the literature review chapters were synthesised in order to come up with the gaps in knowledge of the study. This sets the scene for the approaches adopted for the empirical phase of the study.

4.2. Municipal Solid Waste Management

In Nigeria, waste is perceived as “any material that lacks utility or an object or substance that the owner or generator voluntarily or involuntarily relinquishes ownership” (Nigerian Environmental Society, Undated). Municipal solid waste on the other hand, is defined by the Intergovernmental Panel on Climate Change
As waste collected by municipalities or local authorities and typically includes household waste, commercial/institutional waste, garden (yard) and park waste (Eggleston et al., 2006). It is composed of: food waste, garden (yard) and park waste, paper and cardboard, wood, textiles, nappies (disposable diapers), rubber and leather, plastics, metal, glass including pottery and china and waste such as ash, dirt, dust, soil and electronic waste.

An annual estimated total of 1.3 billion tonnes of municipal solid waste is generated globally and solid waste currently contributes to about five percent of global Greenhouse Gas (GHG) emissions (UNEP, 2011; Hoornweg and Bhada-Tata, 2012). As a result, waste management is thus a concern that has gained global recognition especially as regards achieving sustainability. It is understood that the waste sector has a vital part to play in terms of the move towards sustainable development as it has the potential to move from being a minor source of global GHG emissions to becoming a major saver of emissions via waste prevention and recovery rather than waste treatment and disposal (UNEP, 2010).

In 2004, China became the largest waste generator in the world surpassing the USA and it is anticipated to produce twice the amount of municipal solid waste generated by the USA by 2030 (Hoornweg and Bhada-Tata, 2012). Hoornweg and Bhada-Tata (2012) further postulates that by 2025, the volume of global solid waste will increase by 2.2 billion tonnes (See Table 4.1). The implication of this according to Hoornweg and Bhada-Tata (2012) is that the cost of SWM will increase from $205.4 billion to about $375.5 billion and the cost increase will be most severe in low income countries and lower-middle income countries with more than fivefold and fourfold increases respectively. This makes most developing countries especially African countries excluding Gabon, Namibia, Seychelles and South Africa; the most vulnerable in terms of the cost increase (Gabon, Namibia and South Africa are classified as upper-middle income countries).

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2 Nigeria is a member of IPCC
3 Equivalent of £143 billion and ₦40 trillion
4 Equivalent of £261 million and ₦74 trillion
Table 4.1: Current Municipal Solid Waste Generated in each Region and Projections for 2025  
Source: Hoornweg and Bhada-Tata (2012).

<table>
<thead>
<tr>
<th>Region</th>
<th>CURRENT DATA</th>
<th>PROJECTIONS FOR 2025</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Region</td>
<td>Total Urban Population (Millions)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Africa</td>
<td></td>
<td>260</td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td></td>
<td>777</td>
</tr>
<tr>
<td>Eastern and Central Asia</td>
<td></td>
<td>227</td>
</tr>
<tr>
<td>Latin America and the Caribbean</td>
<td></td>
<td>399</td>
</tr>
<tr>
<td>Middle East and North Africa</td>
<td></td>
<td>162</td>
</tr>
<tr>
<td>Organisation for Economic Co-operation and Development</td>
<td></td>
<td>729</td>
</tr>
<tr>
<td>South Asia</td>
<td></td>
<td>426</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>2,980</td>
</tr>
</tbody>
</table>

* The list of countries that make up these regions are attached as Appendix 1
As a result of the composition of the waste generated and in a bid to protect the environment especially as regards achieving sustainability, the concept of waste management has evolved. From the simple collection and transportation of waste to landfills, waste management has evolved to a more sustainable and complex system which includes waste prevention, reuse, recycling, waste treatment and the application of landfill technology (Salhofer et al., 2007; EEA, 2013).

In order to curb and manage waste effectively, developed countries have drastically moved from the concept of ‘end of pipe’ treatment – incineration and landfilling - to the sustainable concept adopting the waste management hierarchy (UNEP, 2011) as shown in Figure 4.1. For example, the United Kingdom adopted Article 4 of the revised EU Waste Framework Directive referred to as ‘waste hierarchy’ as part of national law through the Waste (England and Wales) Regulations 2011 (DEFRA, 2012). The hierarchy sets out five steps in descending order of environmental preference; prevention, reduction/reuse, recycling, other recovery (for example energy recovery), disposal.

![Waste Management Hierarchy](image)

**Figure 4.1: Waste Management Hierarchy**
After: UNEP (2011)

However, research by Brunner and Fellner (2007) demonstrates that the waste hierarchy is not the most appropriate strategy in achieving the aims of waste management for regions that spend less than 10 Euros$^5$ per capita per year for

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$^5$ Equivalent of £7.80 and ₦2,248
waste management. The findings of Brunner and Fellner (2007) demonstrates that the ‘one size fits all’ strategy is not an appropriate solution to waste management as waste generation and composition differs from region to region and country to country. It is therefore important that each region determines what strategy is most suitable to achieve waste management goals and meets the three sustainability criteria – economic, social and environment. Thus, there is the need to apply the integrated SWM strategy, the current paradigm for SWM, to selected national contexts and cases.

Integrated solid waste management involves the use of the waste hierarchy in selecting and combining the most appropriate waste management strategy taking into consideration the institutional, social, financial, economic, technical and environmental factors of the region/country (EPA, 2002). This invariably means that there is no one universal solution to waste management as different regions/countries differ in their waste generation, composition, categorisation and factors as mentioned. For example, the city of Guangzhou, China combines recycling, composting, incineration and landfilling (Medina, 2011), whereas Singapore applies the 3R’s of waste minimisation from source (reduce, reuse and recycle) before incineration and disposal at landfills as the least used disposal method (Bai and Sutanto, 2002). Koufodimos and Samaras (2002) proposed recycling, composting, incineration (alone or combined with energy recovery) and landfilling for the city of Pilea, Greece. While a combination of material sorting at waste source (for recycling) and composting for the Island of Corfu, Greece was proposed by Skordilis (2004) as the most efficient strategy. Since developing countries generate a higher proportion of organic waste than developed countries (Hoornweg and Bhada-Tata, 2012) their strategy as regards MSWM will differ from that of developed countries.

The enormous responsibility of MSWM in most countries usually lies within the local authority’s scope (Guerrero et al., 2013). Only a few countries still have their national Government responsible for waste in municipalities. For example, in Singapore waste management is the responsibility of the Ministry of Environment (Bai and Sutanto, 2002).
Even with the large population of developing countries – Asia and Africa are the first and second largest continents in the world with a population of 4.1 billion and 1.1 billion respectively (Haub, 2012; The Ecology Global Network, 2015) - waste generated in developed countries is usually higher than that in developing countries (Brunner and Fellner, 2007; Haub, 2012). However, the developed countries have achieved the first aim of waste management which is to protect human beings and the environment and are now focused on the second aim which is the conservation of resources, whereas the first aim still remains the main priority of developing countries (Brunner and Fellner, 2007).

Most developing countries, especially in Africa, are yet to curb the challenges of SWM and the enormous problems associated with improper waste management such as flooding, degradation of the physical environment, air pollution, risk to public health, and pollution to surface and ground water (Ogbonna et al., 2007). For example, the outbreak of a plague-like disease in Surat, India in 1994 with a death toll of 56 people, was as a result of uncollected solid waste that blocked drains and led to major flooding (UN-HABITAT, 2010). This thus reveals the significance of prioritising SWM concerns in developing countries.

4.3. Municipal Solid Waste Management in Africa

With a total population of 1.1 billion, Africa is the second most populous continent after Asia (Haub, 2012). It is a continent faced with enormous challenges and one of the major challenges faced by the African continent in the 21st century is environmental degradation – deforestation, air, land and water pollution, desertification, and loss of biodiversity - which is partly human-induced (not necessarily by Africans) or anthropogenic and becomes intensified as a result of the rapidly growing population (The African Society, 2008). With increasing population in Africa and the rapid growth in urban areas in the order of 3.5% annually, regarded as the highest in the world, one of the most crucial health and environmental problems facing the government of African cities is MSWM (Achankeng, 2003; Mwesigye et al., 2009). This to a large extent is as a result of the growing population which affects solid waste generation. It is already estimated that by 2025 the African urban population will increase by 99% which will invariably increase the total tonnes of waste generated per day by 161%.
(Hoornweg and Bhada-Tata, 2012). Also, the enormous health and environmental problems associated with poorly managed solid waste are of great concern to African governments. For example, as a result of poor sanitation especially regarding waste management, Sierra Leone recorded its worst cholera outbreak in 15 years in 2012 with an estimated 19,000 cases including 274 deaths (WHO, 2012).

According to Palczynski (2009), from the point of waste generation to the point of disposal, waste management is characterised by inefficiencies. Waste is usually not segregated and is dumped indiscriminately along streets and even rivers causing environmental pollution, blockage to drainage systems/culverts thereby resulting in flooding and posing health challenges (Agunwamba, 1998; Momodu et al., 2011; Edjabou et al., 2012). Most often waste management processes (especially reuse and recycling) are carried out informally by scavengers who risk their health in order to secure a source of livelihood by sorting out materials (especially glass, plastic and metal) that can be reused based on market availability (UNEP, 2005). Waste management is thus an issue of concern in Africa.

In most African countries, the management of municipal solid waste lies within the functions of the local authority; although most industries and organisations organise and handle their waste independently using waste management contractors (Henry et al., 2006). An estimated 20% to 50% of the municipality’s budget is spent on SWM and waste collected is between 20% to 80% (Achankeng, 2003). Thus, as a result of the low collection rate, uncollected waste constitutes risk to public health and environment, by flooding, air and land pollution.

The practice of waste management in Africa is poor and characterised by enormous challenges. Amongst these challenges are low financial base and human resource capacity, accelerated urban growth, inadequate infrastructure, poor choice of equipment and bad roads, the attitude of the urban population conditioned by the people’s social and cultural background (Schubeler et al., 1996; Barton et al., 2008; Asase et al., 2009; Mwesigye et al., 2009; Awosusi, 2010; Ezeah and Roberts, 2012). Other major contributory factors to poor waste
management practices in Africa are inadequate and inefficient education and communication channels between the stakeholders (especially between the government and the civil society), weak implementation of policies and by-laws, inaccessible roads, inefficient system of refuse fee collection, an absence of planned waste recycling systems, and short contract duration with private sector (Palczynski, 2009; Kirama and Mayo, 2016). Palczynski (2009) further stated that most waste management strategies are based on models of industrialised countries, which usually assume a totally different technical, financial and organisational framework particularly concerning primary collection and these models fail as they are not suitable for the African society particularly owing to the difference in the socio-economic background of the people. Also, Kirama and Mayo (2016) posits that the success of SWM system will depend on the accountability of the municipal authorities as they are in positions to raise awareness in terms of illegal dumping and improved willingness to pay for refuse fees, the enforcement of existing by-laws, and the planning and promotion of environmentally friendly waste management practices.

Palczynski (2009) also identifies the political and organisational contexts of MSWM referring to the authoritarian, bureaucratic and top-down political cultures of some African counties and how this shapes the delivery of policy at local level. Given these contexts, communication between the leaders and the followers can be very poor and policies frequently fail as a result of poor communication and inclusion of all stakeholders (Knutsen, 2009; Oxfam, Undated). Literature seems to suggest that, most policies, frameworks and models for development fail because they were simply copied from the industrialised world and enforced on the populace with little form of modification to suit the African society owing to the difference in the socio-economic background of the people (Palczynski, 2009).

The generation, composition and density of waste vary from region to region as well as from country to country, so does the political, economic, social-cultural background differ. It therefore suggests that as a result of these differences there is need for a different approach in order to address SWM concerns.
4.4. Municipal Solid Waste Management in Nigeria

Like other African countries, MSWM is one of the greatest challenges facing all stakeholders and tiers of government in Nigeria (Ogwueleka, 2009). This challenge is made worse by the alarming rate of urban population growth compounded by the lack of the necessary infrastructure, the enormous amount of waste generated, and the attitudes of the populace towards waste (Ogwueleka, 2009; Awosusi, 2010; Agwu, 2012; Ezeah and Roberts, 2014). As a result of uncontrolled urbanisation, illegal structures and neighbourhoods emerge within and outside urban centres affecting city plans and eventually services such as SWM (Kadafa et al., 2013). This inefficiency has resulted in urban centres characterised by heaps of refuse, flooding as a result of blockage of drainage system, poor sanitary conditions, high risk of exposure to diseases and environmental degradation (Ossai, 2006; Ogbonna et al., 2007; Adewole, 2009; Oyeniyi, 2011).

4.4.1. Nigeria

With an estimated population of 167.9 million and an estimated average annual population growth rate of 2.54%, Nigeria is the most populous nation in Africa and the sixth most populous nation in the world (Oyedele, 2011; CIA, 2013). Such population growth is posing severe challenges such as poverty, increased stress on resources, health and education facilities and other infrastructure to the Nigerian government and the populace (Lawan, 2012; Ovbiagele, 2012). The management of waste is an area in which the strain is evident as the existing systems are incapable of handling the amount of waste generated (Adewole, 2009).

Nigeria is made up of 36 states with a Federal Capital Territory (FCT) and is presumed to have over 250 ethnic groups (Solomon, 2009; CIA, 2013). Nigeria has a total landmass of 923,768 square kilometres – composed of 910,768 square kilometres of land and 13,000 square kilometres of water. The country is located in Western Africa, sharing borders with Benin, Cameroon, Chad and Niger as shown in Figure 4.2 (CIA, 2013).
Nigeria has mainly two seasons, the wet and dry season from April to October and November to March respectively, with maximum mean temperatures between 28°C and 40°C (Adejuwon, 2006). Also, between December and February, a period of cold, dry, dusty winds known as ‘harmattan’ is experienced (Nkwocha et al., 2011). Evidence suggests that high temperatures (the highest temperatures occur in the northern part of Nigeria) usually result in faster decomposition of biodegradable waste especially in the presence of water (Sundberg and Jonsson, 2008; Kianirad et al., 2010).

Nigeria is a country rich in natural and human resources (Jocobson, 2013). However, it is a country with a rapid urbanisation growth at an annual rate of 3.75% (CIA, 2013). This rapid urbanisation growth rate intensifies the issues of social and environmental services – particularly MSWM - as there is an increase in the volume and variety of solid waste generated and the government is at a loss as to how to achieve a clean environment in terms of SWM (Ayotamuno and Gobo, 2004).
4.4.2. Nigeria’s Goal towards Achieving a Clean Environment

Nigeria is amongst the 189 countries which adopted the following eight Millennium Development Goals (MDGs) of the United Nations that were expected to be achieved between 2000 – 2015 (UNDG, 2013):

- Eradicate extreme poverty and hunger,
- Achieve universal primary education,
- Promote gender equality and empower women,
- Reduce child mortality,
- Improve maternal health,
- Combat HIV/AIDS, malaria and other diseases,
- Ensure environmental sustainability, and
- Develop a global partnership for development.

The 2013 report of the United Nations reveals that substantial and laudable progress was made in the areas of poverty reduction, accessibility to drinking water, the fight against malaria and tuberculosis but a bolder and speedy action still needs to be taken on primary sanitation and environmental protection (which is the focus of this research), education, hunger, maternal health and child mortality. As at 2013, the access to improved sanitation was 33.70% against the 2015 target of 70.0% (MDGs Nigeria, 2013).

In a bid to achieve the MDGs, the Nigerian Government came up with different development plans and policies within the framework of the MDGs amongst which were; National Economic Empowerment Development Strategy (NEEDS) – a programme set to address wealth creation, employment generation and poverty reduction and value re-orientation (Nwosu, 2008), VISION 20:2020 – a developmental policy/plan for Nigeria to become one of the world’s 20 largest economies by 2020 (Enwegbara, 2013), 7 points Agenda – to address power and energy, food security, wealth creation, transport sector, land reforms, security and education (Oke et al., 2011).
The report of the first national implementation plan of VISION 20:2020 in 2010 suggests that, ineffective and insufficient SWM is one of the major environmental threats that impede Nigeria’s development resulting in the country’s poor environmental performance. Environmental sustainability and sanitation are a part of the 29 defined thematic areas of the VISION 20:2020 developmental programme of Nigeria (Accenture, 2009). The emphasis here is that sanitation and health are key concerns that need to be incorporated into policy programmes in Nigeria because of the alarming rate of urbanisation, which intensifies environmental problems and sanitation infrastructure. And as stated by Hoornweg and Bhada-Tata (2012), it is difficult for governments that are not effectively able to manage waste to cope with other complex services such as education, health and transportation. Taken together, these are acute and pressing development goals that Nigeria needs to face.

In September 2015, a new agenda featuring 17 goals referred to as Sustainable Development Goals (SDGs), which is to build on to the MDGs was adopted. The new set of goals are for a 15 year period with the overall aim of ending poverty, promoting prosperity and people’s well-being while protecting the environment (UN, 2015a). The Secretary General of the UN further recognises the fundamental role of Nigerian State Governors to implementing these sets of goals (UN, 2015b).

To further reveal the significance of addressing waste management concerns, the United Nations Environment Programme (UNEP) in 2015 issued the Global Waste Management Outlook (GWMO). The GWMO provides an outlook of waste management around the world revealing the impact of inaction, the importance of adopting the 3Rs and its benefits, and also provides the rationale and tools for taking holistic approach towards waste management (UNEP, 2015).

The practice of waste management falls within Goal 12 of the SDGs with a 2020 target to achieve environmentally sound management of waste throughout their life cycle in order to significantly minimise their adverse impact on human health and the environment by reducing their release to air, water and soil (UN, 2015c).

The significance of this study lies within the 2020 target of Goal 12 as the study focuses on providing an understanding of SWM practices of market users in order
to address issues associated with indiscriminate handling and disposal of waste within MPEs, which in turn poses risk to public health and the environment.

It is commendable that the Nigerian Government is determined to achieve a clean environment through its various development plans and policies regarding the MDGs. It is expected that, further strategies and policies will be developed in order to address the SDGs.

4.4.3. Waste Management Legislations

Nigeria operates a federalist system of government made of three tiers; Federal, State and Local Government, each level supposedly independent of the other (Usman and Esidene, 2012). As such, responsibility for SWM is determined by the political structure of the State. As a result of the challenges posed by waste management, the Federal government by decree 58 of 1988 established the Federal Environmental Protection Agency (FEPA) amongst other functions to oversee SWM at all tiers of government (Ezeah and Roberts, 2014). In 1999, as a result of reforms, the Federal Ministry of Environment was established and took over the functions of FEPA and currently administers and regulates environmental laws in Nigeria as well as public awareness on environmental issues (Ogwueleka, 2009).

At the State and Local government level, paragraph (h) of the 1999 constitution of the Federal Republic of Nigeria confers the responsibility of waste management on Local Governments (Ayotamuno and Gobo, 2004). However, as a result of the inability of Local governments to cope with the responsibility of effective waste management, most State Governments step in to take over or complement the efforts of the Local Government in urban centres for the purpose of achieving a clean environment (Olanrewaju and Ilemobade, 2009; Amuda et al., 2014). For example, the Abuja Environmental Protection Board (AEPB) is responsible for SWM in Abuja, the Rivers State Environmental Sanitation Authority (RSESA) is responsible in Port Harcourt. In Lagos State, the Lagos Waste Management Authority (LAWMA), Lagos State Environmental Protection Agency (LASEPA), the local authorities and the Ministry of Environment and Physical Planning are responsible for keeping the environment clean
(Kofoworola, 2007; Ogbonna et al., 2007; Imam et al., 2008). However, the State governments are still unable to meet up with the responsibility of effective MSWM.

4.4.4. Waste Generation and Composition

There is currently a steady rise in solid waste generation in Nigeria which has been continually attributed to rapid urbanisation, population growth, industrialisation and the lack of an effective waste management system (Olanrewaju and Ilemobade, 2009; Uwadiegwu and Chukwu, 2013).

There are few available and reliable data sources as to the quantity and composition of municipal solid waste generated in Nigeria (Dauda and Osita, 2003; Ukpong and Uofia, 2011; Nnaji, 2015). However, the quantity of solid waste generated and its composition in Nigeria is significantly influenced by the time of the year (especially during festive periods for example Christmas, New Year, and Easter celebrations), local culture, traditions, personal income, changes in consumption pattern and social behaviour (Imam et al., 2008; Ayuba et al., 2013). Furthermore, the quantity of solid waste generated at various States in Nigeria differs and is strongly influenced by the population, level of industrialisation, socio-economic status of the citizens and the type of commercial activities carried out in the State (Babayemi and Dauda, 2010).

An estimated 25 million tonnes of municipal solid waste is generated in Nigeria annually (Ogwueleka, 2009). Households and commercial centres account for about 90% of total municipal solid waste with an estimated 0.58kg/person/day (Solomon, 2009; Arukwe et al., 2012). This estimate is still within the 0.2 - 1.1kg/day range of waste generated per person in developing countries (UNEP, 2011; Hoornweg and Bhada-Tata, 2012). However, as already mentioned, the quantity of waste generated per person in Nigerian cities and its composition vary between cities. For instance, the average rate of waste generated in Abuja, the capital of Nigeria, is estimated at 0.55 - 0.58kg/person/day (Solomon, 2009). In Lagos, which is the former capital and the city with the largest population in Nigeria, it is estimated at 1.1kg/person/day (Kofoworola, 2007), while in Port Harcourt the hub of oil and gas activities, waste is estimated at 1.45kg/person/day (Ogbonna et al., 2007).
The composition of waste in Nigeria is highly organic and an estimated density of waste from 280 – 370kg/m$^3$ (Ayuba et al., 2013). The high organic nature of waste is consistent with the composition of waste in other developing countries for example Addis Ababa – Ethiopia (Regassa et al., 2011), Togo (Edjabou et al., 2012), Jordan (Abu-Qudais and Abu-Qdais, 2000) and Malaysia (Kathirvale et al., 2004).

The presence of highly organic waste creates opportunity for composting and anaerobic digestion for the purpose of realising agricultural fertilizer or energy (Kerroum et al., 2014).

4.4.5. Waste Storage

Waste is usually not separated at source and in some Nigerian cities like Abuja and Port Harcourt, the government/waste management agencies have provided (though insufficient) bins along streets and large receptacles at few commercial and planned residential areas (Ayotamuno and Gobo, 2004; Imam et al., 2008).

Depending on their affluence, waste is usually temporarily stored in wheeled bins, bin bags, paper bags, broken buckets, by the fence of a property or at open collection points within neighbourhoods or streets depending when collection services are available (Ukpong and Udofia, 2011; Kadafa et al., 2013).

4.4.6. Waste Collection and Transportation

In Nigeria, waste collection services are generally poor, inefficient and irregular (Nkwocha et al., 2011). Waste collection service is provided either by the public (State and Local Government agencies or appointed contractor) or private sector (contractors or informal waste collectors appointed by individuals or group of persons for a fee) and this to a large extent depends on location – since a majority of the streets are unplanned (Ezeah and Roberts, 2012).

House-to-house service is rare in Nigeria and provided mostly by private waste collectors appointed by individuals/groups of individuals (Adewole, 2009). The usual waste collection practice entails the contractor appointed by the Government collecting waste from receptacles and waste dumped around the receptacles, unauthorised collection points along streets and communal centre
collection – a particular location to dump waste or an area provided with bins (Ogwueleka, 2009). Picture 4.1 illustrates a typical waste collection point.

Picture 4.1: Typical Waste Collection Location in Nigeria
Source: Field notes (2014).

As a result of the inefficiency on the parts of the contractors as regards timely and regular delivery of waste collection services, it is normal to see uncollected heaps of waste along streets and public spaces (Nkwocha et al., 2011). Whenever it rains or is windy, the uncollected waste is scattered and littered along the streets or the waste is washed into drains, thereby causing drainage blockage and resulting in flooding and pollution of land, air and surface water. This indicates that the situation is not different from the practice in marketplaces (Chapter 3: Section 3.6).

The vehicles commonly used for the transportation of waste includes compactor trucks, side loaders, rear loaders, mini trucks, tippers, skip trucks and open back trucks (Ogwueleka, 2009). However, it is common practice to see informal waste collectors transport waste with wheelbarrows or handcarts made of wood and metal as shown in Picture 4.2.
4.4.7. Reuse, Recycling and Resource Recovery

The practice of re-use and recycling of waste is mainly carried out by the informal sector in Nigeria which includes the itinerant waste buyers (they move from door to door to buy recyclable materials), scavengers (door to door scavengers, street/communal collection point scavengers, dumpsite scavengers), middle men, artisans, small scale enterprises and companies (Adebola, 2006; Wilson et al., 2009; Abila and Kantola, 2013). The major materials usually sought after for reuse and recycling by the informal sector includes; various grades of plastics, glass especially bottles, scrap metals, aluminium cans, fabric and sole of foot wears (Nzeadibe, 2009). However, research by Achi et al. (2012) in the city of Abeokuta, Nigeria, reveals that where waste is sorted before disposal, the purpose given by a majority of the respondents was as a result of economic benefits and patronage of itinerant buyers.

Picture 4.3 and Figure 4.3 respectively shows a scavenger sourcing for materials from waste receptacle and the typical chain of operation of the informal waste sector in Nigeria.
Figure 4.3: Scavenger Sourcing for Materials from Waste Receptacle
Source: Field notes (2014).

As illustrated in Figure 4.3, literature reveals that the scavengers and the itinerant waste buyers are the vanguards of reuse and recycling in Nigeria. While the itinerant waste buyers source for materials from door to door, the scavengers exploit all...
avenues where waste is generated or disposed to source for reusable or recyclable materials. The materials are sold off to middlemen, who in turn sell off to either small scale business owners, artisans or manufacturing companies. However, the itinerant buyer also has an option of selling off directly to small-scale business owners and artisans.

The importance of reuse and recycling of waste is currently being acknowledged by governments (both Federal and State) in Nigeria. For example, the Federal Government in 2012 provided waste recycling plants for Ekiti and Rivers State (Okubenji, 2012). However, there is no research yet as to whether recycling programmes have been incorporated into these State Governments’ MSWM programmes or as to the success recorded in recycling. Also, the success of the participatory research by Olaseha et al. (2005) resulted in a 100% increase in sorting of waste by traders in an Ibadan market. This inspired the State Government in establishing a five tonne capacity organo-mineral fertiliser.

Also, few State Governments have incorporated recycling into their waste management programmes and are taking steps towards resource recovery. For example, the Ondo State Government set up the Ondo State Integrated Waste Recycling and Treatment Project (OSIWRTP) which has the success record for recovering organo-mineral fertilizer from organic waste, converting plastic waste into pellets, scrap metals into ingots and also intends generating about 30% of the State’s electricity from waste gas (Olanrewaju and Illemobade, 2009). Similarly, the Lagos State Government has incorporated the informal waste sector into its waste management programme and in Lagos State, papers and nylon/plastics are being recycled, fertilizer is being recovered from organic waste and the Lagos State Government in five years intends generating a percent of the electricity consumed by Lagosians from waste gas (Cocks, 2013; LAWMA, 2013).

The action of these State Governments is commendable and it will be reassuring if other State Governments can take a leaf from their counterparts. The advantages associated with incorporating recycling, resource recovery and the informal sector into waste management programmes are enormous. Advantages include protecting the environment, generation of revenue, reducing poverty level
thereby achieving the now SDGs, job creation, and improving the social status of the marginalised informal waste worker (Kofoworola, 2007; Oumarou et al., 2012). Research by Agunwamba (2003) suggests that an estimated 18.6% savings in waste management costs and 57.7% in landfill avoidance costs could be achieved with a well-planned and implemented recycling programme that entails recycling and composting. This finding supports the application of the integrated SWM model in the management of solid waste.

4.4.8. Approaches to Waste Management Participation in Nigeria

In Nigeria, the public and private sector are the two major participants as regards waste management operations. Basically, public sector participation entails government setting up agencies with the responsibility of collecting, transporting and disposing waste, whereas private sector participation involves a contractual agreement between a privately-owned waste management organisation and the government or private waste generator(s) for the purpose of collecting, transporting and disposing waste (Uwadiegwu and Chukwu, 2013). The private sector service is mostly employed by the government and individuals or companies that can afford the charges (Ezeah and Roberts, 2012).

The private sector is categorised into formal private sector and the informal sector. The formal sector is made up of companies, group of individuals or individuals that carry out contractual waste management services as a business venture (Uwadiegwu and Chukwu, 2013). While the informal sector is made of single individuals or group of individuals who collect and transport waste to communal collection points, scavenge reusable and recyclable materials from temporary and permanent dumpsites or from households waste (Wilson et al., 2006). The informal sector participants comprises the itinerant waste buyers, waste collectors, scavengers (door to door scavengers, street/communal collection point scavengers, dumpsite/landfill scavengers), middle men, artisans, small scale enterprises and manufacturing/export companies (Adebola, 2006; Wilson et al., 2009; Abila and Kantola, 2013).

However, even with the governments’ partnership with the private sector, the concerns associated with MSWM are still in existence. This has been linked mainly to the lack of supervision and monitoring, and the lack of competition as
the government works with a selected number of private service providers (Ezebilo and Animasaun, 2012; Anestina et al., 2014).

4.4.9. Waste Treatment and Disposal

In Nigeria, the common practice for waste disposal by the formal and informal waste sector is open dumping with burning as the only treatment option in order to reduce the quantity of waste at dump sites (Tamunobereton-ari et al., 2012). The dumpsites are usually located along or beside major roads outside the city with a few located within the city capital and there are no regulations as regards compliance and monitoring (Ogwueleka, 2009; Ayuba et al., 2013).

However, the majority of the populace who do not have access to waste collectors or who cannot afford the services of private waste collectors, dispose their waste into nearby rivers, bushes, and drains, or decide to bury their waste, place it within incomplete buildings and undeveloped plots, or take to the roadside or burn their waste near their residence (Babayemi and Dauda, 2010; Ukpong and Udofia, 2011; Achi et al., 2012; Kadafa et al., 2013). Such actions deface the physical environment as well as posing risks to public health and the environment (Arukwe et al., 2012).


The challenges associated with MSWM in Nigeria are enormous (Ezeah and Roberts, 2012). These challenges have been categorised into six broad areas – environmental, financial/economic, institutional, political/legal, socio-cultural and technical barriers. These barriers are presented in Table 4.2 and discussed afterwards.
Table 4.2: Summary of barriers to Effective Solid Waste Management Practices in Nigeria
Source: Imam et al. (2008), Asase et al. (2009), Ezeah and Roberts (2012), Stanley et al. (2012)

<table>
<thead>
<tr>
<th>Environmental</th>
<th>Financial/Economic</th>
<th>Institutional</th>
<th>Political/Legal</th>
<th>Socio-Cultural</th>
<th>Technical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of environmental control systems</td>
<td>Insufficient funding</td>
<td>Lack of waste knowledge by municipalities and private contractors</td>
<td>Lack of adequate legislations and policies</td>
<td>Lack of public awareness</td>
<td>Lack of appropriate equipment</td>
</tr>
<tr>
<td>Lack of environmental impact assessment</td>
<td>Insufficient private sector participation</td>
<td>Leadership style</td>
<td>Weak regulations</td>
<td>Poor attitudes of the populace</td>
<td>Unskilled personnel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Decision making process</td>
<td>Lack of stakeholders involvement</td>
<td>Unplanned cities</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lack of training</td>
<td>Poor condition of waste workers</td>
<td>Time schedule for collection</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Poor vehicles and roads</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Use of models from developed countries</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Absence of reliable data</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Poorly designed route system for waste collection</td>
<td></td>
</tr>
</tbody>
</table>
Environmental barriers: The absence of a strategic environmental planning of waste management practices is a keep barrier to enhancing SWM practices in Nigeria (Awosusi, 2010). Research by Asase et al. (2009) reveals there is a lack of evaluation of the impacts of solid waste on the environment.

Financial/Economic barriers: The insufficient funding of SWM activities is a significant barrier to enhancing SWM systems in Nigeria (Imam et al., 2008). Due to the increase in population, which has increased solid waste generation, there is a need to improve on the funding of SWM. Imam et al. (2008) recommends the implementation of user charges as a way of addressing financial barriers as this will complement municipal taxes.

Institutional barriers: According to Ezeah and Roberts (2012) the lack of training and use of unskilled staff to take charge of the responsibilities of SWM is a major constraint to effective SWM.

Political/Legal: The lack of adequate waste management legislations and the enforcement of existing legislations is required in order to address SWM concerns (Imam et al., 2008). Just as in other African countries, Asase et al. (2009) posits there is a need for the enactment of strong and adequate legislations to guide waste management decisions and strategies.

Socio-cultural barriers: Generally, there is a lack of public awareness or concern for SWM, the attitudes of Nigerians towards waste is poor and this has an effect on effective waste management practices in Nigeria (Imam et al., 2008). It is common practice to dispose waste into drains, on the street, highways, etc and the majority of Nigerians perceive the environmental quality as the sole responsibility of the government (Adewole, 2009; Babayemi and Dauda, 2010). Also, delegating the duties of waste disposal to minors remains a major challenge (Imam et al., 2008).

The resultant effect of their attitude towards waste is the degradation of the physical environment, air pollution, risk to public health, pollution to
surface and ground water, etc (Ogbonna et al., 2007). Based on their attitude towards waste, it has become a challenging task to provide a clean and safe environment. Available research indicates that the poor attitude of the populace towards solid waste is primarily as a result of the lack of appropriate waste collection systems, lack of waste facilities and lack of knowledge of environmental issues associated with inappropriate waste handling (Babayemi and Dauda, 2010; Achi et al., 2012; Stanley et al., 2012). However, as stated by Guerrero et al. (2013), the involvement of the stakeholders in the waste management process is critical to a successful waste operational system. A typical example is the case reported in a city in Pakistan by Klundert and Anschutz (2001). The case involved the residents not dropping off their waste in the containers provided even after numerous changes were made to the location of the containers. However, an NGO, in trying to solve the puzzle, decided to talk to the residents and discovered that based on the culture, women in Purdah were forbidden to leave their household compounds or have contact with men, and their husbands were of the opinion that disposal of waste was the duty of women. The problem was resolved by advising the women to give their waste to their children or street children for a fee.

The above case illustrates that most times the barrier to effective waste management practice is not always as a result of lack of money or infrastructure. In the context of the case stated above, the lack of communication and stakeholder’s involvement in the development of waste management strategies could be a barrier to effective waste management system. This supports the argument of Barr (2007) that inasmuch as the presence of an effective economic, technical, legal and environmental infrastructure is important, in order to have an effective waste management strategy, it is also fundamental to identify and clearly have an understanding of factors that influence individual/stakeholder’s attitude and behaviour towards waste. Based on the above, it is therefore important to identify the probable factors that could affect the attitude of
individuals and give such factors appropriate consideration before arriving at waste management strategies.

- **Technical barriers:** The concerns associated with ineffective SWM in Nigeria has been linked severally to technical factors. According to Ezeah and Roberts (2012) the situation most often is that even basic collection containers such as bin bags or waste receptacles are unavailable. There is also a lack in collection vehicles and a frequent breakdown of available machinery (Awosusi, 2010). Ezeah and Roberts (2012) posits that the inadequacy in machinery is as a result of the inability to maintain such vehicles because such vehicles were imported from advanced countries and the spare parts for maintenance have to be ordered from the manufacturer or were no longer being produced, and so not readily available for purchase in Nigerian markets.

Other technical barriers that affects SWM is the lack of accessibility resulting from unplanned cities and poor road networks (Nnaji, 2015). Reliable technical data is often absent in informing decisions about the logistical management and disposal of solid waste (Dauda and Osita, 2003; Ukpong and Udofia, 2011; Nnaji, 2015), meaning route optimisation for collections is not effectively implemented (Nnaji, 2015).

### 4.6. Factors that could Influence Attitudinal Change.

Even with the provision of appropriate waste management infrastructure or systems, the success of MSWM especially in Africa is interrelated with the engagement and attitude of the stakeholders (the end users) (Barr, 2007; Agwu, 2012). Thus, there is a need to engage with the stakeholders and identify what factors should be considered while developing SWM strategies in order to address attitudinal change. The need for an inclusive approach is emphasised by various research as being critical to a successful waste operational system (Guerrero et al., 2013; Asomani-Boateng, 2015).

Research findings on some of the factors that could influence the attitude of the stakeholders towards waste management practices are presented in Table 4.3.


Table 4.3: Factors that could Influence Waste Management Practices

<table>
<thead>
<tr>
<th>Waste Management Processes</th>
<th>Author(s)</th>
<th>Attitudinal Change Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recycling</td>
<td>Perrin and Barton (2001), Tonglet et al. (2004), Barr (2007), Suttibak and Nitivattananon (2008), Haldeman and Turner (2009)</td>
<td>• Awareness&lt;br&gt;• Face to face contact with stakeholders&lt;br&gt;• Monetary incentives including interest and compensatory goods for recycling populace&lt;br&gt;• Transportation cost&lt;br&gt;• Low investment cost&lt;br&gt;• Convenience&lt;br&gt;• Knowledge of local recycling service&lt;br&gt;• Access to kerbside recycling facility&lt;br&gt;• Design of the recycling scheme&lt;br&gt;• Concern for the community and the consequences of recycling</td>
</tr>
<tr>
<td>Separation of food waste</td>
<td>Suttibak and Nitivattananon (2008), Ghani et al. (2013)</td>
<td>• Knowledge on waste separation at source&lt;br&gt;• Storage convenience and collection times&lt;br&gt;• Provision of the necessary facilities and the provision of free organic waste bins for composting</td>
</tr>
<tr>
<td>Re-use</td>
<td>Barr (2007)</td>
<td>• Convenience&lt;br&gt;• Storage space&lt;br&gt;• Satisfaction derived from reusing items</td>
</tr>
<tr>
<td>Waste minimisation</td>
<td>Barr (2007)</td>
<td>• Strong environmental and citizenship values&lt;br&gt;• Awareness of waste management problems</td>
</tr>
<tr>
<td>Littering</td>
<td>EU (2014)</td>
<td>• Availability of public litter bins&lt;br&gt;• Better enforcement of existing anti-litter laws&lt;br&gt;• Encouraging alternative to plastic bags or other plastic packaging&lt;br&gt;• Communication campaigns to raise awareness</td>
</tr>
</tbody>
</table>

Data in Table 4.3 reveals that awareness and knowledge of waste management practices is a key theme in addressing attitudinal change regarding waste management practices. However, according to McKenzie-Mohr (2011), studies
have revealed that knowledge alone has little effect on attitudinal change. Even when individuals have knowledge of a particular subject, there might still exist other individual or structural barriers that could influence the behaviour of the individual. It is important to take into consideration these other barriers. There is therefore the need to augment knowledge with other factors having identified the barriers in order to stimulate a change in attitude.

In understanding environmental behaviour, Barr et al. (2003) proposed a holistic framework on environmental behaviour based on the theory of reasoned action. The framework takes into consideration three main groups of variables; environmental values, situational factors, and psychological variables and suggests that environmental behaviour mostly lies on the individual’s environmental values which is most often shaped by situational and psychological factors. Environmental values are based on an individual’s underlying orientation towards the environment and tend to act in accordance with these beliefs. Situational factors comprise of factors that shape the individual’s environmental actions at a given time based on the person’s situation. This includes contextual factors – access to services; socio-demographic factors – age, gender, education; and prior knowledge and experience of the activity. The third group relates to psychological factors which includes subjective norms (such as social pressure), environmental threat (perceived threat to welfare based on environmental problems), response efficacy (a belief that the individual’s actions can make a difference), self-efficacy (belief in the capacity to act), intrinsic motivation to act (personal satisfaction).

Given that waste prevention processes (the three R’s) are voluntary actions by the waste generators, a series of studies have been undertaken to establish the factors that (could) motivate the waste generators in undertaking these activities. Studies have revealed that inconvenience, inadequate facilities especially regarding kerbside recycling facilities, and storage space are major barriers in realising the full potentials of waste prevention (Barr, 2007; Suttibak and Nitivattananon, 2008; Haldeman and Turner, 2009; Ghani et al., 2013). A study by Banga (2013) on household knowledge, attitudes and practices in solid waste segregation and recycling revealed the barriers to solid waste segregation and
recycling in Kampala, Uganda, was mainly as a result of situational factors; access to service, level of awareness of recycling activities, household income, educational level and gender. However, a significant finding by Perrin and Barton (2001) reveals that although the introduction of the kerbside recycling scheme addresses the key barriers to recycling – inconvenience, inadequate facilities, and storage problems - the provision of an appropriate kerbside design scheme is a major motivator to ensuring maximum participation rates.

A study on the factors that influence household SWM practices by Mukui (2013) revealed carelessness, socialisation style and long distances to the nearest collection point as the key influential factors. As regards indiscriminate dumping in marketplaces, the study by Taiwo and Ajayi (2013) revealed illiteracy, ignorance, negligence and laziness as the key factors that influenced the attitudes of the traders.

In Africa, the use of educative campaigns is a significant driver (intervention) geared towards attitudinal change of the populace. This has been incorporated severally in programmes aimed at changing the attitude of the populace towards health concerns such as malaria, HIV/Aids, and tuberculosis (Curtis et al., 2001; Loosli, 2004; Ndegwa et al., 2012). Strategies channelled towards attitudinal change in health issues most often incorporate educative campaigns as a tool. Loosli (2004) also recommended the involvement of community leaders in attitudinal change programmes because of their social powers. This was one of the strategies employed by the World Health Organisation (WHO et al., 2006) in the eradication of polio in Northern Nigeria as a result of misconceptions and resistance to immunisation.

4.7. General Features and Overview of Municipal Solid Waste Management Practices of Case Study – Port Harcourt

Port Harcourt usually referred to as the ‘Garden City’ is the capital of Rivers State and located in the Niger Delta region of Nigeria. It is the second largest city in the southern part of Nigeria and regarded as one of Nigeria’s most important industrial and commercial cities (Ayotamuno et al., 2010). Port Harcourt has an annual mean temperature of 29°C (Ideriah et al., 2006), and is bounded mainly
in the eastern, western and southern sides by swamps, creeks and rivers (Ayotamuno and Gobo, 2004).

Port Harcourt city is formed of two Local Government Areas – Port Harcourt city and Obio/Akpor Local Government Areas (Agwu, 2012) as illustrated in Figure 4.4 and has an estimated population of 2,340,000 (Demographia, 2015).

Figure 4.4: Map of Port Harcourt Metropolis
Source: Elenwo and Sunday (2014)

Port Harcourt became the operational base for multinational petro businesses with the discovery of oil in the Niger Delta in the 1950’s and this led to a rapid influx of migrants seeking work in the petrochemical industry and its offshoots (UN-HABITAT, 2009). With a heavy concentration of human population as well as industrial and commercial activities, land use became complex and the solid waste generated increased in volume and variety (Ayotamuno and Gobo, 2004).

Waste management activities in Port Harcourt are currently carried out by private contractors under the supervision of the Rivers State Environmental Sanitation
Authority (RSESA); a parastatal under the Rivers State Ministry of Environment established by law in 1986 (Ogbonna et al., 2007; Babatunde et al., 2013).

The roles and responsibilities of RSESA as set out by the Laws of Rivers State of Nigeria (Laws of Rivers State of Nigeria, 1999) as it relates to SWM within Port Harcourt and its environs includes:

- Organise and carry out the collection and disposal of waste
- Provision of waste collection points and centres for removal and final disposal
- Directing and controlling the dumping of waste in its areas of operation
- Ensuring the clearing of refuse from refuse collection points and centres

Section 12 subsection (1) of the law also confers with the Authority, power to delegate any of the aforesaid functions to consultants, technical partners or contractors.

The usual practice of MSWM in Port Harcourt is that the Government provides locations or receptacles at urban centres – marketplace, street corners, road junctions where waste should be dumped and evacuated to the dumpsite by the private waste contractor (Ayotamuno and Gobo, 2004; Ogbonna et al., 2007). However, like other urban centres in Nigeria, the practice of waste management in Port Harcourt is characterised by inefficiency (Agwu, 2012). The inefficiency in waste management services has been linked severally to the unplanned population growth, industrialisation and urbanisation which increases the pressure to provide waste services coupled with the poor attitude towards waste by individuals (Adekunle et al., 2012; Agwu, 2012).

Waste is constantly indiscriminately dumped at street corners, gutters, on the ground, informal waste dumps, resulting in blockage of drains, air, surface and ground water pollution and risk to public health (Abah and Ohimain, 2010). As a result of the overwhelming presence of littered waste and heaps of waste around the urban centre, Port Harcourt, which is known as the ‘Garden City’ of Nigeria, was once referred to as the ‘garbage city’ of Nigeria by Ayotamuno and Gobo.
Even the Rivers State environmental sanitation and waste management authorities are currently at a loss as to how best to handle waste (Ogwueleka, 2009; Abah and Ohimain, 2010). This situation calls for a different approach to addressing SWM concerns.

4.8. Summary and Conclusions

The review of literature reveals that the practice of MSWM in Nigeria is marred by inefficiencies; lack of the necessary infrastructure, insufficient funding, unskilled personnel, lack of adequate legislations and poor enforcement of existing ones, lack of appropriate strategies and policies, unplanned cities and poor road networks. However, the attitude of the people is also a significant factor that militates the waste management system in Nigeria. Agwu (2012) affirms that despite the considerable attention given SWM in Nigeria, the attitudes of the people defy whatever strategy is put in place. There is thus a need to address the attitudes of the people in order to proffer guidance in dealing with SWM concerns.

Based on the reviewed literature in this chapter, Figure 4.5 illustrates the typical range of practices of people towards waste in Nigeria.
Figure 4.5: Current Municipal Solid Waste Management Practice in Nigeria.
From the first point of waste generation as illustrated in Figure 4.5, the waste generator utilises any of the three options; waste is either littered, temporarily stored or reusable and recyclable materials are sold to itinerant buyers. Next, the waste generator either utilises the services of an informal waste handler to transport the waste to a communal receptacle, or authorised open collection point from which the Government waste handler evacuates the waste to the final disposal site, transports the waste themselves to the communal receptacle or authorised open collection point, disposes the waste indiscriminately or engages the services of a private waste handler who transports the waste directly to the final disposal site. Waste disposed at the communal receptacle or authorised open collection points and the final disposal sites is scavenged in order to recover reusable or recyclables materials.

As illustrated in Figure 4.5, the Government or waste contractors expects the end users to dispose waste in the communal receptacle provided or authorised open collection points to enable ease of collection based on the inability to collect waste from house-to-house. But waste is rather disposed in drains, uncompleted buildings, undeveloped plots, rivers, by the road or buried and this intensifies the challenges of effective SWM. This same indiscriminate approach to waste is practiced in MPEs (as discussed in Chapter 3: Section 3.6). Based on the health and environmental challenges posed by the indiscriminate dumping of waste, it is pertinent to examine the attitudes of the people.

4.8.1. Gap in Knowledge

Drawing from literature reviewed in three chapters (Chapters 2 – 4), this study argues for a need to understand the factors that underpin the attitudes of market users towards waste in order to address SWM concerns in MPEs.

A majority of marketplace research focuses on the social and economic impacts of marketplaces (Hill, 1966; Good, 1973; Smith, 1979; Jerome and Ogunkola, 2000). It is conventional to analyse the marketplace as a social or economic institution. Much research has discussed the opportunities the marketplace presents as a vehicle for developmental strategies (Ladipo et al., 1990; Nezic and Kerr, 1996; Morales, 2011). However, there is a paucity of research that analyses
the MPE as a facility that is in need of adequate management especially as regards the management of solid waste. Existing research on marketplace sanitation includes that of Bammeke and Sridhar (1989), which focused on the composition of waste in markets in Ibadan, Nigeria and recommended composting as a result of the high organic content. Olaseha et al. (2005) considered developing sustainable market waste management through the joint efforts of technocrats and traders and recommended a community-based approach to solving the problems of waste disposal in markets. Likewise the study by Asomani-Boateng (2015), which revealed that the adoption of a participatory and inclusive approach to managing waste in markets can effect better waste management systems in markets. Abejegah et al. (2013) and Worlanyo (2013) sought to determine the level of awareness and practices of SWM among market users, and Taiwo and Ajayi (2013) established the challenges of environmental pollution and factors that influence waste disposal in markets. Other existing research is mainly on waste from a related facility – abattoirs (Adeyemo, 2002; Adeyemi and Adeyemo, 2007; Emeka et al., 2009; Nwanta et al., 2010; World Bank, 2009a). However, marketplace research has not looked into management practices regarding SWM, nor provided deeper understandings of the contribution of the MPE to the formation of attitudes and subsequent sub-optimal environmental behaviours and practices. A World Bank global report (2009a) confirmed that research on waste management in African marketplaces is an area that has been neglected despite the high risk to public health and environmental problems posed by waste in this facility.

In the management of this facility - the MPE - literature suggests that the attitude of the users is a contributory factor to inadequate SWM. The market managers are at a loss as to how best to address this concern as they have insufficient knowledge and tools at their disposal to affect a change.

It might be argued that the absence of the necessary infrastructure for effective waste management practice is a major barrier that has encouraged poor attitudes towards waste (Babayemi and Dauda, 2009; Achi et al., 2012; Stanley et al., 2012). Even with the provision of the necessary infrastructure however, such poor attitudes still exist amongst most urban dwellers (Agwu, 2012).
A typical case in a city in Pakistan reported by Klundert and Anschutz (2001) reveals that most times poor attitude of the populace towards waste is not always as a result of lack of money or infrastructure. Poor attitude towards waste could be as a result of other factors such as socio-cultural factors (religious beliefs and practices, education, gender, background) or the lack of stakeholder’s involvement in the development of waste management strategies.

In the context of waste management, Godfrey et al. (2012, p.2167) defines good attitudes towards waste management practice as “waste activities that are compliant with waste and environmental legislation; that promote the waste hierarchy and support waste avoidance, minimisation, reuse and recycling; and that minimise the impact of waste and possible associated pollution on the environment and human health”.

The study of attitudes towards waste in this research is being undertaken in the waste management context. Thus, based on the definition of Godfrey et al. (2012) with reference to Figure 4.5, poor attitudes towards waste in the Nigerian context is the disposal of waste in areas other than the authorised locations – communal receptacles and authorised open collection points.

Barr et al. (2003) posits that an individual's environmental value is shaped by situational and psychological factors. Studies regarding waste prevention processes have further established inconvenience, inadequate facilities especially regarding kerbside recycling facilities, and storage space are major barriers in realising the full potentials of waste prevention (Barr, 2007; Suttibak and Nitivattananon, 2008; Haldeman and Turner, 2009; Ghani et al., 2013). Barr (2007) thus argues for the need of a different approach to addressing SWM concerns by first identifying and having a clear understanding of the factors that underpin attitudes towards waste before addressing the structural barriers that needs to be in place.

In as much as literature has identified attitudes as a factor that exacerbates SWM concerns (Schubeler et al., 1996; Imam et al., 2008; Balogun, 2012), there are no clear indications or evidence of existing literature of an understanding of the factors that underpin attitudes towards SWM practices in MPEs. This therefore
clearly establishes a gap in knowledge. This study thus aims to fill this gap in knowledge by undertaking a study of attitudes of the market users towards waste and providing an understanding of practices of market users of the same. This knowledge will lead to the provision of the appropriate tools that will aid the market managers in dealing with SWM concerns. Literature has rather provided a blanket appraisal and have tagged the attitudes of the populace as poor without providing a clear understanding or identifying the factors that underpin attitudes.

This study will contribute to the body of knowledge of in-depth understanding of African MPEs particularly in Nigeria (Hill, 1963; Jerome and Ogunkola, 2000; Ikioda, 2012; Onyango et al., 2013). This study also intends to contribute towards bridging the gap of knowledge by establishing and evaluating the key underlying factors that underpin the attitudes of market users towards waste. The study will determine what factors should be prioritised in the SWM strategy for MPEs that will enable the market facilities manager to address SWM concerns in this facility. It is anticipated that this will aid the role of facilities managers in the management of MPEs. This will also enhance the quality and improve the performance of the MPE in terms of providing a safe, pleasant and convenient environment for its users. Pertinent amongst the concerns this will address is hygiene and public health concerns associated with the use of this facility. It is anticipated that the change in attitudes of the users could have a significant effect on their general attitude towards waste beyond the MPE, since everyone in one way or the other has contact with the marketplace.

In this study, the users being considered are the traders and the buyers/visitors. The study seeks to provide answers to the overarching research questions of the study (Section 1.3.2). In order to provide answers to the research questions and achieve the overall aim of the study, the research philosophy and methodology adopted is presented and discussed in the next chapter.
Chapter 5. Research Methodology and Design

5.1. Introduction

It has been presented that SWM in marketplaces is of great concern especially owing to the risk it poses to public health and the environment. Although, SWM practices is well studied in Africa, SWM practices in African marketplaces have not been given substantive academic attention. Several studies have acknowledged the effect of attitudes of the people on SWM practices (Balogun, 2012; Taiwo and Ajayi, 2013), however, there is a lack of research that evaluates and provides an understanding of the dynamics of the MPE especially regarding SWM practices and the factors that underpin the attitudes of the market users.

This study has thus posed the (research) questions below in order to investigate and provide an in-depth understanding of the practices of the market users towards waste:

1. What are the dynamics of the MPE with reference to SWM practices?

2. Why do we still have markets where waste is a problem?
   2.1. How do we enhance SWM practices in the MPE?
   2.2. What are the key underlying factors that underpin the attitudes of the market users towards waste?

In providing answers to the research questions, the study adopts an exploratory approach with a sequential mixed model design. This chapter presents a systematic approach of the methodology, outlining the research design and justification of the strategy adopted to give answers to the research questions and arrive at a significant research contribution.

The systematic approach developed by Saunders et al. (2012) referred to as the ‘research onion’ was adapted for this chapter. Having presented and discussed the research design detailing the overall plan of the study, the philosophy underpinning the research is presented. This is followed by the research process revealing the nature of the research, the research approach and the research...
strategy. The criteria for the selection of the cases is presented afterwards. This is followed by pilot testing of the research instruments and the sampling technique adopted for the study. The data collection strategy for the study is presented afterwards. This is followed by the research instruments and method of data analysis adopted for the study. The ethical concerns associated with undertaking the study is discussed afterwards. The researcher provides details on how these concerns were addressed and managed throughout the course of the study (especially during the empirical phase). The section also discusses the management of data collated in the course of the study.

5.2. The Research Design

The study is exploratory research that adopts a sequential mixed model design. In this type of study as described by Cameron (2009), qualitative data is first collected and analysed which is subsequently followed by the collection of quantitative data, the findings of the former providing basis and informing the latter. Although there is no evidence of the adoption of this design in marketplace research pertaining SWM concerns in Africa, I saw the need to adopt a different strategy as it provides an understanding of market life and practice regarding SWM and then offers basis for further investigation and triangulation utilising a quantitative data collection method in order to provide market managers with the adequate tools and knowledge to address SWM concerns. In other words, it provides a basis for moving between contexts and deepening understandings, to probing and gaining further insights into factors that could enhance SWM practices. This strategy was borne out of evidence on reviewed literature revealing market managers lacked sufficient tools and contextual knowledge in dealing with SWM concerns in MPEs.

The research was divided into three phases as illustrated in Figure 5.1. In addition, a summary of the three phases of the study, detailing the research instruments employed and how they contribute to achieving the objectives is shown in Table 5.1.
Figure 5.1: Research Design
Table 5.1: Summary of Research Activities

<table>
<thead>
<tr>
<th>Phase</th>
<th>Action</th>
<th>Methods</th>
<th>Analysis</th>
<th>Contribution to research objectives</th>
</tr>
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</table>
| 1     | Review of Literature on FM, MPE and MSWM. This lead to the development of a conceptual model that guided the empirical phase of the study and the identification of the gap in knowledge. Also, this lead to the identification of case study criteria, the selection of (4) cases for the study, and the formulation of questions for the generation of qualitative data to fill the knowledge gaps of the study. | - Literature search  
- Development of conceptual model                                                                 | Critical Analysis                  | The review of literature provided an understanding of the MPE in the FM context revealing the key concern the study set to address – SWM. This contributed to achieving objectives 1 and 2 of the study. |
| 2     | Generation and analysis of qualitative data                                                                                                  | - Observation of 4 cases  
- 43 interviews were conducted                                                                 | Thematic analysis enhanced with the use of QSR NVivo 10                                 | The outcome of this phase provided a contextual knowledge of the MPE, revealing its dynamics as a facility with particular reference to SWM. The key underlying factors that influence the SWM practices of the market users were established. In addition, the factors that could enhance the SWM practicess of the market users were determined. This phase thus contributed to achieving objectives 1, 2 and 3. |
| 3     | Generation, collection and analysis of both qualitative and quantitative data                                                                   | - 746 questionnaires were administered  
- Focus group session made of 10 participants across the cases                                         | RII and ISM                      | Through the application of analytical tools – RII and ISM – the outcome of this phase were the factors to be prioritised in the management of solid waste in MPEs. This thus achieved objective 4 of the study. |
Phase 1 began with the review of relevant literature and this is made of three chapters: chapter two, three and four. The literature review had three core conversations; FM, SWM, and urban marketplaces. The review of literature established the existence of a knowledge gap indicating no clear evidence of existing literature of the social dimensions of the marketplace facility management incorporating the attitudes and behaviours of users in order to understand the factors that underpin attitudes towards SWM practices. Studies by Schubeler et al. (1996) and Barton et al. (2008) established the attitudes of the populace as one of the factors that exacerbate SWM concerns in developing countries. Imam et al. (2008) also confirmed the attitudes of the populace as a significant factor to enhancing SWM practices in Nigeria. However, amongst other factors, the inadequate management of solid waste in marketplaces hinges on the attitudes of the market users (Balogun, 2012). This provided the basis to further generate data to reveal a critical and in-depth understanding of the attitudes towards waste in marketplaces. Thus, the literature review furnished the researcher with the requisite knowledge and understanding that is necessary to enable the formulation of questions for the primary data collection process. A conceptual model (Figure 2.1 and 2.3) was developed to guide the empirical phase in establishing an understanding and interactions of the four components of a facility including the input and expected outputs. Also, based on the review of literature the criteria for the cases of this study was established (see Section 5.5).

Phase 2 was mainly the first stage of data generation and analysis for the study. The data generation in this phase was primarily qualitative, utilising a combination of non-participant observations and semi-structured face-to-face interviews. Considering the paucity of research on SWM in African urban marketplaces (World Bank, 2009a), the use of observations was important in order to provide first-hand knowledge of the dynamics of MPEs and SWM practices within the MPE. This was an important and critical phase of the study as the study relied on primary data. Details of the processes for making observations and conducting interviews for this study is presented in Sections 5.9.1 and 5.9.2. Before commencing with this phase of the study, ethical approval was sort from the
University of Brighton’s School of Environment and Technology Research Ethics and Governance Committee (see Appendix 2).

The data collection process began with the observations after which the interviews followed. The essence of this was to enable the researcher to incorporate themes to be further explored evolving from the observations. The observations were further divided into two phases. Phase 1 was the fact-finding phase which entailed collating information and intelligence gathering on the physical settings of the MPE and the facilities in place. This enabled me to map out the strategy and activities for phase 2, which included the duration and sequencing of all activities in the phase. Phase 2 was the actual observation which was aimed at gaining insights into the settings and dynamics of the MPEs and SWM practices in MPEs. A total of 42 days was spent undertaking observations for the study. The interviews for the study began right after the observations. The interviews focussed on understanding the dynamics of the MPE and SWM practices in the MPE from the perspective of the market stakeholders. The use of interviews was to complement data generated from observations.

The final stage of the second phase of the study was the analysis of the qualitative data generated. The data was analysed thematically and the process was enhanced with the use of QSR NVivo 10 - computer-assisted qualitative data analysis software (see details in Section 5.10.1). The results (see Chapters 6 and 7) from the qualitative data sets provide answers as to the practices and expectations of the market users regarding SWM and the practices of the market managers regarding SWM, thus revealing the factors that could enhance SWM practices of the market users and the underlying factors that underpin the attitudes of the market users towards waste. It revealed how the market environment impacts on practices of SWM of its users, thus providing an in-depth knowledge and new perspective to understanding attitudes towards waste in MPEs. These findings give answers to the research questions of the study.

Phase 3 of the study was the final phase. Additional data was collected in this phase in order to triangulate and complement results from initial findings. A
combination of questionnaires containing both open and closed-ended questions and focus group discussions and exercise was adopted for this phase. The aim of the questionnaire was to determine the relative importance of the factors that could enhance SWM practices of the market users derived from qualitative data sets while the focus group discussions and exercise was aimed at having clarity and in-depth understanding of the factors. Also, the Interpretive Structural Modelling (ISM) methodology was adopted for the focus group exercise in order to determine the contextual relationship between the factors.

Phase three kicked off with the administration of questionnaires after which the focus group discussion and exercise took place. Details of how I went about administering the questionnaires and how the focus group was conducted is presented in Sections 5.9.3 and 5.9.4. The output of these techniques having analysed the data was factors to be prioritised by the market facilities managers in the management of solid waste and the interdependencies between the factors (see Chapter 8). These outputs were then subject to an in-depth review. Based on the review, this phase and the overall study made recommendations that would enhance FM services for the MPE.

5.3. The Research Philosophy

According to Neuman (2011), every research relies on ontological and epistemological assumptions or principles whether or not the researcher acknowledges them and most often a researcher’s methodological choices are implicitly based on these philosophies. Ontology is concerned with what is out there to be investigated whereas epistemology is concerned about how we know things and our perception of acceptable knowledge in a discipline (Walliman, 2006).

The philosophy adopted by a researcher is mainly influenced by the researcher’s view of the world, their view of acceptable knowledge and the process in developing this knowledge (Saunders et al., 2012). For instance, a researcher who is concerned about health will have a different perception to waste management from that of a researcher who is more concerned about finance.
In developing and understanding new knowledge, researchers adopt different philosophies and approaches which could either be pragmatist, realist, interpretive or positivist view (Saunders et al., 2012).

This study falls within the pragmatist perspective. The philosophy of the pragmatist is that the world can be viewed in different ways and research can be undertaken via whatever method or strategy that enables valid research findings and in the process relies a lot on mixed methods (Creswell, 2009). This implies that researchers have different views of the world and acceptable knowledge, thus based on their views they could adopt different methods and strategies in order to arrive at valid research findings. For instance, in relation to this study, probably the first perspective of a social scientist would be to analyse the marketplace as a social institution while an economist will be more interested in analysing the marketplace as an economic institution. Based on their varied perspective, they would adopt different methods and strategies in order to arrive at valid research findings.

For this study, the researcher has adopted an unconventional approach to analysing the marketplace – as a facility. Conventionally, marketplaces are analysed as either a social or an economic institution. Based on concerns associated with SWM in MPEs, it has become necessary to examine and understand the practices and factors that underpin the attitudes of market users towards waste. This involves the use of suitable research methods in order to obtain an in-depth understanding of the perceptions of the research phenomenon in order to generate rich data, including observation of the MPE so as to better understand how the physical environment of the marketplace influences attitudes to waste, as well as waste disposal practices and behaviours. The adoption of the pragmatist perspective is thus appropriate for this study as it enables the researcher to discover the interactions, the use of market space and market operations and at the same time provides insights to the perception of the market users regarding SWM practices.
5.4. Research Process

Researchers adopt a methodology which is dependent on the question the research is seeking to provide answers to. This section discusses and provides justification for the methodological approach adopted for this study.

5.4.1. The Nature of the Study

The nature of a study could either be explanatory, descriptive or exploratory.

Explanatory research seeks to discover and report the relationship between variables within a research setting (Saunders et al., 2012) and addresses the ‘why’ in the study of a phenomenon (Neuman, 2011). In essence, it seeks to offer an explanation as to the reason things happen. In descriptive research, the elements of a phenomenon is identified and systematically recorded thus providing specific details or a picture (the setting, situation, relationship etc.) of the phenomenon (Fellows et al., 2008; Neuman, 2011). According to Neuman (2011), the outcome of a descriptive research is usually a detailed depiction of the research subject or an answer to the research question. Exploratory research is concerned with discovering and gaining insights about a particular research phenomenon (Saunders et al., 2012). In essence, the purpose of a research is exploratory when it seeks to gain additional knowledge and understand what happens in a particular research setting in order to adequately define the problem. By adopting the exploratory design, the researcher gains familiarity with the research phenomenon and is then able to develop a hypothesis, having gained an understanding (Babbie, 2007).

This study is exploratory in nature as it seeks to provide an in-depth understanding of the dynamics of MPEs and also uncover the key underlying factors that influence the attitudes of the market users towards waste. The study is concerned with providing an understanding of the happenings in the MPE regarding SWM; the interactions and actions of the market users, the interpretation of their actions from their perspective, and the effect of the market environment on their SWM practices. It is important to have an understanding of the research phenomenon - the MPE - before further data is collected so as to address the research problem – SWM practices. This will enable a better
understanding of MPE operations and how the knowledge gained can be used to effect better SWM practices

A key advantage of exploratory design is that it allows for the use of a range of research techniques or methodology; ethnography, interviews, focus groups, documents/archival record analysis, case studies (Shields and Tajallli, 2006). By adopting an exploratory research design and the research instruments for this study (see Section 5.9), the study will provide a richer insight into the space, attitudes of users, social norms and management practices to inform practical changes in the management of waste in the MPE.

5.4.2. Research Approach

There are three approaches to research depending on the reasoning adopted by the researcher; deductive, inductive or abduction (scientific method) reasoning (Walliman, 2006; Saunders et al., 2012). Deductive reasoning occurs within existing knowledge/theory boundaries where data is collected in order to refute or verify the theory (usually theory to data) whereas inductive reasoning is the opposite as it tends to generate or extend theories (usually data to theory) (Bryman, 2008; Fellows et al., 2008). On the other hand, abduction reasoning is a combination of both deductive and inductive reasoning. Abduction reasoning involves inductively developing hypothesis based on observations and then deductively charting their implication before testing them in order to generate or modify existing theory (Walliman, 2006).

The research falls within the inductive approach as it seeks provide an in-depth understanding of the dynamics of MPEs in order to uncover the key underlying factors that underpin the attitudes of market users towards waste. Although there is available literature on African marketplaces and SWM practices there is a lack of research that provides an understanding regarding attitudes of market users towards waste. This research thus intends to generate new knowledge based on data collated.
5.4.3. Research Strategy

Carrying out research can be likened to planning a journey. Like most journeys the traveller decides the most suitable route for the journey which also depends on some factors for instance availability of money, the weather or time factor. This is the same for carrying out research, as the researcher needs to determine a suitable methodology that will aid the researcher in providing answers to the research question(s) and objectives of the study. Saunders et al. (2012) stated that the linkage between the research question(s) and objectives and the research philosophy, the research approach and purpose, the availability of time and other resources, the access to potential participants and other source of data, and the extent of existing knowledge, are other factors that will determine the research strategy adopted by a researcher.

This study started off by demonstrating that MPEs can be analysed as a facility. Thus, in order to conceptualise this understanding, a conceptual model (see Figure 2.1 and 2.3) depicting the FM system was developed. The essence of this was to form the basis to understanding the MPE as a facility. And so, this model guided the empirical phase in providing an understanding of the components that form the MPE and how these components interact. The study went on to provide an understanding of SWM practices and as stated in previous chapters, there is a paucity of research on SWM practices in African urban marketplaces. However, marketplace researchers (with particular reference to SWM) such as Olaseha et al. (2005), World Bank (2009a), Balogun (2012) and Asomani-Boateng (2015) adopted the case study research strategy utilising a mixed data collection technique; observations and survey instruments in order to gain insights into market interactions and practices of SWM in marketplaces.

Thus, the case study strategy was also adopted for this study as the study seeks to provide in-depth contemporary knowledge of the research subject within its real life context (Yin, 2014). In other words, case study research examines a phenomenon taking into consideration its present settings in order to build an in-depth focused understanding of a particular context or set of contexts. The study of the research subject within its context according to Yin (2014) distinguishes
the case study strategy from other strategies such as experiment, survey and archival research. For instance, surveys allow for the examination between things measured in the survey in order to establish correlations, relationships and associations, but are not efficient means to providing an understanding of the complexity of the things being studied. Whereas, case studies enables a holistic approach that accounts for the interrelationship between the components that make up the case studies (Fisher and Buglear, 2004). Although criticisms arise as to the issue of generalisation of findings in case study research as to surveys, the crucial feature of conducting case study research is to generate an intensive examination of a case that generates theory out of findings (Bryman, 2012).

An advantage of the case study strategy is that it allows the use of qualitative, quantitative or mixed methods to collect and analyse data (Saunders et al., 2012). This implies that the case study strategy allows for the use of different methods and the triangulation of data where mixed methods is utilised. Eriksson and Kovalainen (2008) posits that the use of several methods in the collection of empirical data makes the case study approach more accurate, convincing, diverse and rich. Also, based on the nature of this study – exploratory, and the research questions (case study approach seeks to provide answers to ‘why’, ‘what’ and ‘how research questions), the case study strategy was deemed most suitable for this study.

A multiple case study approach (four cases) was adopted for this study (see Section 6.2 for details of cases). The study also utilised a mixed data collection and analysis approach. With the application of both methods, the researcher tends to arrive at a finding that is rich in breadth and depth - since the quantitative research is known to have broader coverage while qualitative research offers an in-depth understanding of a phenomenon. Literature suggests that the application of both methods to a single study tends to reduce the disadvantage of adopting one approach over the other (Fellows et al., 2008; Creswell and Plano Clark, 2011). However, Bryman (1984) notes that there are no superiority in the choice of techniques rather some techniques are more useful than the other based on the research context.
The research instruments and method of analysis are discussed in Sections 5.9 and 5.10 respectively.

5.5. Criteria for Selection of Case Studies

Denzin and Lincoln (2005) assert that in order to provide an in-depth and critical understanding of the research phenomenon, the case(s) must be chosen well. Eriksson and Kovalainen (2008) stated that the study aim(s) and research question(s) are the key determinants in the selection of cases. Yin (2014: p.28) captured this by noting that:

“You need sufficient access to the data for your potential case – whether to interview people, review documents or records, or make field observations…You should choose the cases that will most illuminate your research questions”.

As such, in the selection of the cases for this study, the set of six criteria proposed by Miles and Huberman (1994: p.34) was considered. These features as they relate to the selection of cases for this study are presented below:

1. The relevance of the sample to your conceptual framework and research questions: The cases selected for this study were relevant to the research questions (see Section 1.3.2) set out by this study. They are set within the research context and exhibit the problem being addressed by the study.

2. The appearance of the phenomenon of concern of the study in the case: This relates to whether rich data would be provided on the phenomenon of concern of the study; in this case, SWM concerns in the use of the marketplace. The cases selected for this study have been identified to exhibit the problem being addressed by this study.

3. The ability of the sample to enhance ‘generalisation’ of findings: The term generalisation here does not refer to statistical generalisation rather generalisation to theory where empirical findings supports or refutes existing theory (Eriksson and Kovalainen, 2008). Hillebrand et al. (2001) argues that a researcher can establish theoretical generalisation by demonstrating causal relationship on the basis of both structural similarity
of cases and logical argumentation. Hillebrand et al. (2001: p. 654) further sustains this argument by maintaining that causal relationships can be established by “setting up a reasoning based on empirical facts, logical argumentation and formerly accepted theories which in turn are based on empirical facts, logic and even earlier accepted theories”. Taking this on board, the cases selected for this study have got structural similarity with a majority of African marketplaces (see Chapter 3), thus the findings can allow for a theoretical generalisation only with reference to the critical factors investigated in this study.

4. The sample should produce ‘believable’ descriptions and explanations true to real life: The cases for this study were selected based on the evidence of the existence of the research problem – SWM. Based on observation, these cases will also provide a convincing account of the SWM practices within the cases and the practice of market managers.

5. The feasibility of the sample plan: Here, Miles and Huberman (1994) refer to the resources available to the researcher; time, money, access to the people and the researcher’s work style. Curtis et al. (2000) further expatiates to include the relevance of the researcher’s competency in terms of linguistic and communication skills, ability to relate to informants and their experience or the researcher/informant’s ability to cope with the circumstance under which data collection may take place. A significant feasibility factor in the choice of the cases for this study relates to linguistic and communication skills. Marketplaces are a focal point and an extension of the society, and so the users tend to relate in languages of the region. For instance, in Nigeria, apart from English language and pidgin which are key in communication, in the South-West communication is also mainly in Yoruba, in Northern Nigeria; Hausa, in the East; Igbo, while in the South-South due to a diversity of dialects – Ijaw, Itsekiri, Efik, Isoko, Urhobo, Ogoni - communication is mainly in English and pidgin. The importance of linguistic and communication was factored into the selection of cases.

6 A simplified version of English language and broken English
Being a local of the case study region reduced the difficulties that would have risen in communicating with the informants and the understanding of the interactions within the MPE.

6. The ‘ethicality’ of the sampling plan: This relates to whether or not the method of selection addresses ethical concerns such as informed consent, potential benefits and risks associated with and relating to participation in the study, and the relationship of the researcher with informants. See Section 5.11 on the ethical concerns addressed in this study.

These criteria were put into consideration in the selection of cases for this study.

5.6. Pilot Testing

The key emphasis on piloting questions is to ensure the research instruments function well (Bryman, 2012). For this study, the interview questions and questionnaire were first pretested with supervisors and colleagues with knowledge of the research subject – basically knowledge of markets in Africa. The essence of using colleagues with knowledge of this subject was to enable content validity of the questions (Saunders et al., 2015). Also, the questions were tested in order to ensure that they met the aim of the questionnaire and interview. Following on from that, the questions were tested in the field initially and found to be suitable before going ahead with conducting the interviews and administering the questionnaires.

Feedback on the questions enabled me to address concerns on clarity of questions and instructions. Also, a key outcome of pretesting the questionnaire was in the analysis of the same. I realised in the analysis of the data, the use of cross correlation in order to determine the relationship between the factors that could enhance SWM practices was not suitable for the study. As such, I had to address this outcome by researching other methods to analyse the data.

Details of the research instruments for this study are presented in Section 5.9
5.7. Sampling

Morse (2000) suggested some factors as guidelines that would aid researchers in determining sample size. The factors include; the scope of the study, the nature of the topic, the quality of data and the nature of the topic. These factors were considered while making decision for sample size for this research.

Saunders et al. (2012) posits that non-probability sampling (with specific purpose) are usually adopted for research instruments such as interviews. For this research, a combination of convenience and purposive sampling was adopted in the selection of interview and focus group participants. Convenience sampling is a sampling procedure adopted based on the accessibility of the research participants while purposive sampling refers to the selection of participants who can provide the desired information and they fit into the study criteria (Sekaran and Bougie, 2013). For the interviews and focus group discussions for this research, the market regulators and waste handlers were specific groups within the study that would provide data in order to answer the research questions. It was therefore important to incorporate their thoughts within the study.

In the use of questionnaires for this study, a combination of quota and convenience sampling was adopted. The quota sampling was utilised to determine traders’ participation as the (traders) population in the old markets have quotas – traders with shed, traders by the fence, hawkers - and it was important to have a representative sample of the traders in order to obtain a representative data. Thus, the researcher ensured that data was obtained from the various categories of traders within the marketplace.

5.8. Data Collection Strategy

As discussed in Section 5.2, the study was divided into three phases. In this section, I briefly discuss how I approached the empirical phase of the study and the processes incorporated to enable data generation for the study.

Data for phase one was collected over a period of eight weeks (7 May – 1 July, 2014). Before travelling abroad for the data collection, the Port Harcourt LGC was
informed in advance of their contribution and appointments were scheduled in order to avoid delays in data collection.

The data collection process began with preliminary enquiry with the LGC in order to determine the following;

1. The number of urban marketplaces in Port Harcourt, this enabled the selection of cases for the study. See Section 5.5 for criteria on case study selection.

2. The structure of the market management, and

3. The rationale of the remodelling of the structure of traditional urban marketplaces (This was also confirmed with the State Government consultant on the remodelling of markets).

After the initial enquiry, the actual primary data collection process began. This started off with non-participant observations of market life and SWM practices in markets (see discussions in Section 5.9.1). Afterwards, the semi-structured interviews for the study were conducted (see Section 5.9.2 for details).

For the second empirical phase of the study, having had access to the LGC and market managers already, they were both contacted to be briefed of the next phase and request was made for their availability and support for this phase. Details of the instruments and how I collected data for this phase is presented in Section 5.9.3 and 5.9.4.

5.9. Research Instruments

The research instrument(s) depends on the question(s) the research intends to address and the knowledge gap. The research instrument chosen to a large extent determines the research success.

Research instruments are broadly categorised into quantitative data instruments; experiments, structured questionnaires, structured interviews, structured observation, structured record reviews such as financial information, and qualitative data instruments; observations, interviews, documents, audio-visual materials (Creswell, 2009; Neuman, 2011).
Given the nature of this study, there is a need for the generation of in-depth and rich data that provides an understanding of the dynamics of the MPE and also an in-depth understanding of SWM practices within the MPE. Also, there is a need to understand the perception of the market users regarding SWM practices.

The data collection instruments for the study were both qualitative and quantitative and include the use of:

- Non-participant observation (complete observer role)
- Semi-structured face-to-face interviews
- Questionnaires with open and close-ended questions, and
- Focus group discussions and exercise

In order to address issues surrounding bias, reliability and validity of the data collected for this study, the researcher ensured the following:

- For the qualitative data, the researcher adhered to the checklist provided by Saunders et al. (2012: p. 383) in order to overcome interviewer and interviewee bias in undertaking the interviews for this study (see Appendix 3 for checklist). For instance, it is important that the researcher has some level of knowledge about the context of the research case, this will enable the researcher during interviews to assess the accuracy of responses and also probe further in certain areas as the case may be (Saunders et al., 2012). Being a local of the case study City, the researcher had knowledge of the research settings and was able to decipher meanings to the language used by the participants. This further enhanced the validity of the data generated from interviews.

- In line with the position of Foddy (1993) regarding the validity and reliability of questions, the questionnaire for this study was tested in the field initially and found to be suitable before going ahead with administering the questionnaires. This enabled content validity of the questionnaire. To further ensure reliability of the questionnaire, question two ‘In your opinion, how would you rate the effect of the following factors on the attitude of the
market users towards waste?’ was integrated within the questionnaire as a ‘check question’. Also, the results obtained from the questionnaire were triangulated with findings from the qualitative data.

The data collection instruments and how I went about collecting data are discussed in the following sub-sections.

### 5.9.1. Non-Participant Observation

Observation is a systematic data collection method in which the researcher is immersed in the natural setting of the subject in order to study activities, events, conditions or people within their natural environment (Baker, 2006; Walliman, 2006). Observation in research falls within two broad categories; participant observation and structured observation (Coolican, 2004; Bryman, 2008). Gill et al. (2002) further categorised participant observation into four types, which vary with the degree of participation required of the researcher;

- **Complete participant**: The researcher becomes a member of the group or social setting as the case may be, which is the subject of the research and the researcher’s true identity is undisclosed.
- **Non-participant observer**: In this role, the researcher only observes the activities, events or behaviour of the research subject without making his purpose known to the subject.
- **Observer as participant**: The researcher’s role and purpose is known to the group.
- **Participant as observer**: The researcher’s status and purpose in this role is known by the group.

Non-participant observation was utilised for this study as the research was concerned about providing data on the dynamics of the marketplaces revealing market operations and market life. Also, the research sought to reveal the practices of the market users regarding SWM practices. Saunders et al. (2012) posits that this technique is suitable over structured observation when the researcher is concerned about why things happen rather than how they happen.
The researcher finds this method most suitable in collecting data that will aid in describing the MPE and providing contemporary data on the dynamics of the MPE and SWM practices in MPEs in order to provide answers to the research questions.

Non-participant observation was carried out on the four selected cases for a period of 42 days mostly between the hours of 6:00am – 7:00pm for the old markets and 7:30am – 6:30pm for the remodelled markets. The use of observation was to provide an in-depth understanding of the interactions and operations within MPEs. It was a prelude to making sense of the occurrences and happenings in the MPE especially regarding SWM practices.

Being a complete observer addressed the issue of ‘reactivity’ associated with the use of observations. By undertaking covert observation the ethical concerns with those being observed altering their behaviour as a result of the presence of the researcher was addressed (Saunders et al., 2015). However, before taking off with the observations, the necessary authority in charge of the urban marketplace (in this case, the LGC and the heads of the traders’ association) were informed of the on-going research. This was for safety purposes (and also not to be treated as an intruder) and to an extent to address ethical concerns with the use of non-participant observation especially the issue of deception.

The actual observation (see Section 5.2 for phases in observation) commenced with the market the researcher was most familiar with (being a local, the researcher shopped more often in this market). This was significant in building the confidence in undertaking observations for the study. However, the conditions of being in the market was now different; the roles have changed to being in the market as a researcher rather than a buyer/visitor. As a buyer/visitor, the researcher had a routine while visiting the market, as shopping was carried out with specific traders. However, being a researcher in the environment was to an extent overwhelming as it was important to account for the various practices of interest within the use of the market space relevant to the study.

The ad libitum sampling strategy was adapted in the observation of the cases. In this technique, the researcher randomly records what people are doing as at the
time it is encountered (Altmann, 1974; Bryman, 2012). This strategy was useful for the study as, apart from trading activities, the study went on to establish the routines, interactions, and idiosyncrasies associated with the use of the market space. Among other activities observed were the market settings and condition, the actors and their interactions, market operations, marketplace activities and rich data on the SWM practices of the market users was generated.

Data was collected on field notes and this included on site data and a recollection of the day's account. Conscious effort was made by the researcher not to write down notes in the presence of the research subjects so as not to create unnecessary attention and at the same time cause panic among the research participants (in the course of carrying out observation, the researcher noticed the traders were always anxious of persons with notes and pen).

The researcher finds this method most suitable in generating data that will provide answers to the research questions of this study thereby addressing the knowledge gap identified.

5.9.2. Semi-Structured Interviews

The use of interviews allows the researcher to probe further on a particular subject in order to have a better understanding or acquire more information. Interviews could be structured, semi-structured or unstructured (Walliman, 2006).

Structured interviews are likened to questionnaires as they are made of identical set of predetermined questions (Saunders et al., 2012). With semi-structured interviews, based on the research questions and objectives, the researcher will have a list of topics or themes to be covered during the interview and the order of questions might vary with other interviews for the research, responding also to the responses of the interviewee to determine new or follow-up questions at certain points (Bryman, 2008). Whereas with unstructured interviews, the researcher seeks to explore the research subject in order to acquire more information thus the interviewee is allowed to respond freely and extensively while the interviewer points out subjects worthy of being followed up (Bryman, 2008). In essence, with semi-structured interviews the researcher makes a list of topics to be covered during the interview although the topics might not be
considered according to the pattern it was structured, whereas with unstructured interviews the researcher starts off with a question that serves as a prompt for other questions depending on the information received from the interviewee.

Interviews could be conducted on a one-on-one basis which could be face-to-face, telephone interview, internet/intranet interview or on group basis which could be focus group or electronic group interview (Saunders et al., 2012).

Semi-structured face-to-face interviews were utilised for this research because it incorporates essential properties of the other types of interviews. In that, with semi-structured interviews, the researcher is in charge and steers the interview session in the preferred direction and at the same time the interviewee is allowed to exhaustively discuss themes or questions put forward by the researcher.

The use of interviews for this study was to further develop an understanding of the nature of MPEs, to probe SWM practices in the MPE and identify key factors that could enhance SWM practices in MPEs.

The market stakeholders as identified in Section 3.4 (see Table 3.1) were classified into five groups for the interview: buyers/visitors, traders, regulators, waste handlers, and sensitisation groups. The interviews were divided into three parts; part 1 was made of common questions that relate to all potential interviewees, part 2 was made of specific questions relevant to each interviewee based on their role in the MPE while part 3 was made of questions relating to waste management practices at MPE. See Table 5.2 for categorisation of interviewees and Appendix 4 for interview guide.
Table 5.2: Categorisation of Interviewees and Number of Interviews Conducted

<table>
<thead>
<tr>
<th>Category</th>
<th>Interviewees</th>
<th>No. of Interviews</th>
<th>Interviews Useful for Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>A – Buyers/Visitors</td>
<td>Buyers/Visitors</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>B - Traders</td>
<td>Traders</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>C - Regulators</td>
<td>Chairperson of market superintendents, Chairperson of management committee, Chairperson of Traders’ Association, staff of RSESA</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>D – Waste Handlers</td>
<td>Waste contractors</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>E – Sensitisation Groups</td>
<td>Banks, health organisations, political party, beverage company</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>43</strong></td>
<td><strong>39</strong></td>
</tr>
</tbody>
</table>

A combination of purposive and convenience sampling was utilised for the interviewing (see Section 5.7 for study sampling). Apart from the interviews with the regulators and waste handlers, interviews with other stakeholders was mainly based on their willingness to partake in the study and age group was taken into consideration – participants for the study must be 18 years and above.

The research aimed to interview a minimum of 15 buyers/visitors and traders because they were the focus of the study and they have a large sample size. Interviews with the traders and buyers/visitors were conducted until a point when the responses were reoccurring. So a total of 12 and 15 interviews were conducted with the buyers/visitors and traders respectively (see Table 5.2). The regulators were limited in number, so the heads were targeted for the interviews. There were only three waste handlers in charge of waste evacuation in the cases

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The category market Regulators for the purpose of this study are stakeholders that are responsible to coordinate and supervise market operations, or oversee certain aspects of market operations in order to ensure smooth operations of markets.
studied and they were all interviewed. The sensitisation groups were varied and six interviews were conducted in this category.

The distribution of the interviews across the cases studied is presented in Table 5.3.

**Table 5.3: Distribution of Interviews across the Cases**

<table>
<thead>
<tr>
<th>Category</th>
<th>No. of Interviews</th>
<th>Old Market (South)</th>
<th>Old Market (North)</th>
<th>Remodelled Market (South)</th>
<th>Remodelled Market (North)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A – Buyers/Visitors</td>
<td>12</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>B - Traders</td>
<td>15</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>C - Regulators</td>
<td>7*</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>D – Waste Handlers</td>
<td>3</td>
<td>1</td>
<td>1*</td>
<td>1*</td>
<td>1</td>
</tr>
<tr>
<td>E – Sensitisation Groups</td>
<td>6</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*The seventh regulator was personnel of the RSESA. Also, one waste handler is responsible for the evacuation of waste in two of the markets.*

Interviews for the study were conducted over 11 days at an average time of 23 minutes for the digitally recorded interviews and an hour thirty minutes for handwritten interviews. 43 interviews were conducted out of which 39 were useful for analysis. Interview venues were carefully selected but because of the rampant power failure in the Nigerian environment, during the course of these four interviews unfortunately there was a power failure. This required the generator to be switched on and there was a lot of interruption in the data generation because of the noise from the generator. It was thus difficult to transcribe those four interviews because of persistent loud background noise emanating from the generator.

It was somewhat challenging getting traders to partake in interviews, even when they (traders) were idle, as they assumed it was distracting to agree to such
commitments. Hill (1963: p.444) captured the challenges in undertaking research in African marketplaces by noting that:

“An African marketplace is one of the most uncomfortable and inconvenient places in the world in which to conduct fieldwork…the difficulties are rather the extreme fluidity and complexity of the undocumented situation and the need to trouble informants at their moment of maximum anxiety, when they are conducting transactions”.

An understanding of the perspective of the participants was thus important in order to accommodate and adapt to the research site.

The interviews for the study commenced with the customers\(^8\) of the researcher. This was helpful as they found it interesting to partake and encouraged other traders to partake in the study. The researcher also took advantage of the weekly market sanitation days to conduct the interviews as traders were not permitted to trade until 10:00am in the morning. The interviews were conducted in the offices of the market leaders and in the stores of the traders in the case of the remodelled markets as they were more comfortable and private. Interviews were digitally recorded with the exception to two which were hand written as the participants were not comfortable with recorded interviews.

### 5.9.3. Questionnaires

Questionnaires are usually adopted for research when the researcher requires wider participation. With the use of questionnaires, each respondent is to respond to same set of questions designed in same pattern (Saunders et al., 2012). It is therefore important that while adopting the use of questionnaires for a study the researcher gives proper thought to questions as the researcher is unable to go back to the respondent (most often the respondent is anonymous) to seek further clarification for responses.

Depending on the research question(s), a questionnaire would be of open-ended questions, closed-ended questions or a combination of both open and closed-

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\(^8\) These are traders the researcher patronised while shopping
ended questions. Open-ended questions allows the respondent unstructured or free response to question(s) whereas with closed-ended questions the respondent have to choose from a list of alternative answers (Neuman, 2011). In other words, with open-ended questions, the respondent is not restricted to a set of answers or the respondent can make further comments on a response thereby availing the researcher unanticipated findings/clarity whereas with closed-ended questions, the respondent has to stick to the options made available by the researcher. However, it is essential that whatever type of question the researcher decides on should be suitable in achieving the research question(s).

There are various means in which questionnaires can be administered. Saunders et al. (2012) broadly categorised them as self-administered questionnaires which includes; postal questionnaires, electronic questionnaires, hand delivered questionnaires, and interviewer completed questionnaires which includes; telephone questionnaire and structured interviews.

Having weighed the advantages and disadvantages of adopting any of the types of questionnaires and method of administration, this research adopted the use of hand-delivered questionnaires containing both open and closed-ended questions. The essence of adopting open and closed-ended questions was to avail the research participants the opportunity to provide further comments on a response on the options made available by the researcher. Given the research settings, hand-delivered questionnaires were most appropriate to collect data. This is so because of the dynamic movement of buyers/visitors; they cannot be associated with a particular market. Also, the traders are usually more interested in trade activities and a majority are semi-educated. Thus, the questionnaires were completed in the presence of the researcher and handed back to the researcher. Where the respondents required further clarification, the researcher was available to provide that support. Hand-delivered questionnaires were thus the fastest and most appropriate means of collecting data.

The study aimed at collating data from key actors in terms of SWM in the marketplace. Thus, the participants were category A – D. A copy of the questionnaire is attached as Appendix 5.
In developing the questionnaire, similar terms used by the market users in the course of conducting the interviews for the study were incorporated into the questionnaire. For instance, sensitisation and orientation simply means awareness. It is also a term widely used in the market by organisations who introduce programmes aimed at educating the market users. Also, waste management office, for the market users simply refers to an office they can report on issues regarding waste or obtain information regarding waste. This is similar to having offices for the market superintendents, where enquiries or disputes relating to market activities are made or settled respectively.

In the course of administering the questionnaires, the researcher made field notes in order to capture the thoughts of the research participants. The use of field notes was important as traders frequently voiced out their thoughts and reasons before making a decision on the questionnaire.

Owing to the design of the study (sequential design), the purpose of administering questionnaires was to probe and gain further insights into the factors that could enhance the SWM practices of the market users. This enabled me to triangulate and complement results from qualitative data. The aim of the questionnaire was to determine the relative importance of the factors that could enhance the SWM practices of the market users.

A total of 746 questionnaires were administered, completed and appropriate for analysis for this study. The questionnaires were administered for a period of four weeks between the hours of 08:00 and 18:00 daily, with exception to Sundays. The participants included traders, buyers/visitors, MPE regulators and the waste handlers. A breakdown of the distribution is illustrated in Table 5.4.

The sample size was drawn in accordance with the procedures stipulated by Creative Research Systems (2015). A 99% confidence level and 5% margin error was adopted in defining the sample size for the study. As highlighted in Section 5.7, quota sampling was utilised to determine traders' participation in the old markets. This is because the traders in the old markets are of three categories; traders with shop/shed, traders by the fence, and hawkers. It was important to
reflect these categories in defining the sample size of the traders. Also, the population of the buyers/visitors was estimated as the population is not known.

In the use of questionnaires for this study, the researcher ensured the administration for each quota and stakeholder category was not less than 10% of the stakeholders’ category population.
Table 5.4: Breakdown of actual Questionnaire Participants

<table>
<thead>
<tr>
<th>Case Studies</th>
<th>Population</th>
<th>Stakeholder’s Category</th>
<th>Strata population</th>
<th>Sample Size (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old market (South)</td>
<td>3310</td>
<td>Traders (with shop/shed)</td>
<td>2570</td>
<td>257</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Traders (by the fence)</td>
<td>430</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hawkers</td>
<td>310</td>
<td>31</td>
</tr>
<tr>
<td>Old market (North)</td>
<td>1120</td>
<td>Traders (with shop/shed)</td>
<td>1020</td>
<td>102</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hawkers</td>
<td>100</td>
<td>10</td>
</tr>
<tr>
<td>Remodelled market (South)</td>
<td>760</td>
<td>Traders</td>
<td>760</td>
<td>76</td>
</tr>
<tr>
<td>Remodelled market (North)</td>
<td>1040</td>
<td>Traders</td>
<td>1040</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>61</td>
<td>MPE regulators</td>
<td>61</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Waste handlers</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Estimated</td>
<td>Buyers/Visitors</td>
<td>Estimated</td>
<td>107</td>
</tr>
<tr>
<td>Total</td>
<td>6294</td>
<td></td>
<td>6294</td>
<td>746</td>
</tr>
</tbody>
</table>
5.9.4. Focus Group Discussions and Exercise

Focus group discussion is a group interview facilitated by the researcher and it allows participants share their perception on specific topics (Robson, 2002). In focus group discussions, the researcher, as the moderator, encourages interaction and responses on a particular topic from the participants in order to uncover their opinion on the topic in focus (Saunders et al., 2012).

The utilisation of human participation in environmental research is increasingly being advocated for in order to have a better understanding of the research problem (Callon et al., 2009). A typical example is the analysis undertaken by Landstrom et al. (2011) in which a collaboration with local residents changed the way participating scientist worked in a flood risk modelling. The use of focus groups thus helps build trust in communities, to break down barriers between scientific and lay knowledge so that interventions become more effective.

The study by Asomani-Boateng (2015) provides evidence of the use of focus group discussions in SWM studies in African marketplaces. The use of focus group for this research was to have clarity on the context of the factors that could enhance the SWM practices of the market users determined from data sets on interviews, and getting stakeholders together to discuss a common problem. There was a need for this study to probe deeper and consider the cases in more depth and from different perspectives. Also, the technique was adopted in order to provide a deeper understanding of the factors and determine the contextual relationship between the factors.

The focus group discussion and exercise for this study was moderated by the researcher. One focus group session made of 10 MPE stakeholders conversant with the problem was organised in order to achieve this. The focus group session was carried out on 5 June 2015 and lasted for a period of approximately four hours (12:00 – 16:00). The selection of the participants was logical as the main criteria for selection was based on relevance and knowledge of the problem (Bryman, 2012). Participants were selected based on their roles, experience in terms of knowledge and familiarity of market operations and or period of years spent in MPE (minimum of five years). For this study, it was assumed that a period
of five years was adequate for the market stakeholders to gain a significant amount of experience in the marketplace. This particular process emphasised and focused on the particular issue – SWM – that needs to be addressed, thus, the criteria for participants was restricted to be amongst category A – D of the market stakeholders. This is because; they are key actors in SWM in marketplaces. Although as outlined in Table 3.1, the two categories of market stakeholders were classified as primary and secondary stakeholders, the secondary stakeholders were not considered because they are not key actors in terms of SWM in the marketplace. Within the primary stakeholders’ category, the carriers were not represented because they have not fulfilled the criteria of relevance and knowledge. See Appendix 6 for focus group discussion and exercise schedule. Details of members of the focus group session and participants code is shown in Table 5.5.

**Table 5.5: Details of Focus Group Members and Participants Code**

<table>
<thead>
<tr>
<th>Stakeholder’s Category</th>
<th>Sex/Details</th>
<th>Age</th>
<th>Years of Experience</th>
<th>Participants Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>A - Buyer/Visitor</td>
<td>F</td>
<td>36 - 45</td>
<td>21</td>
<td>ABV1</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>18 - 25</td>
<td>5</td>
<td>ABV2</td>
</tr>
<tr>
<td>B - Traders</td>
<td>F (Old market)</td>
<td>46 - 55</td>
<td>22</td>
<td>BT1</td>
</tr>
<tr>
<td></td>
<td>M (Remodelled market)</td>
<td>46 - 55</td>
<td>32</td>
<td>BT2</td>
</tr>
<tr>
<td>C - Regulators</td>
<td>M – Chairperson Traders’ Association (Old market)</td>
<td>36 - 45</td>
<td>22</td>
<td>CCMPE1</td>
</tr>
<tr>
<td></td>
<td>M – Chairperson Traders’ Association (Remodelled market)</td>
<td>36 - 45</td>
<td>15</td>
<td>CCMPE2</td>
</tr>
<tr>
<td></td>
<td>M – Chairperson market superintendent</td>
<td>36 - 45</td>
<td>7</td>
<td>CCMS3</td>
</tr>
<tr>
<td></td>
<td>M – RSESA Representative</td>
<td>36 - 45</td>
<td>8</td>
<td>CSA1</td>
</tr>
<tr>
<td>D - Waste Handlers</td>
<td>M (Old market)</td>
<td>36 - 45</td>
<td>8</td>
<td>DW1</td>
</tr>
<tr>
<td></td>
<td>M (Remodelled market)</td>
<td>36 - 45</td>
<td>7</td>
<td>DW2</td>
</tr>
</tbody>
</table>

The stakeholders as shown in Table 5.5 were selected from both the old and remodelled markets. This was done in order to ensure the perspective of the various stakeholders were adequately integrated within the study. All regulators included in the focus groups were males due to availability.
Before the arrival of the participants, the environment was set up to appear comfortable. The seating arrangement was in circle to encourage and ease communication between participants. Participants were then seated in two groups (five in each group) and presented with name tag. I ensured a mix of the participants in the seating arrangement in order to observe the communication pattern between the regulators and the market users.

I started off the session by welcoming the participants, and introducing myself and the research topic and problem. The purpose of the discussion was related to the participants and the ground rules for the session was set out. The ground rules were mainly to encourage participation and control distractions. It included rules on the use of mobile phones, polite communication between participants, assuring participants of the importance of their responses - no right or wrong answers.

The Ketso approach to community facilitation and focus group was adapted to enhance the focus group session of this study. Ketso is a hands-on kit for creative engagement using re-useable coloured shapes to capture everyone's ideas, making it easy to see all of the ideas at a glance, and for everyone in the group to follow the conversation (Ketso, 2011). It can be used to plan a project, neighbourhood, or business, gain feedback on a policy or strategy, review a study topic, develop a presentation or paper, or inform decision making. It is also a tool that is useful to engage with stakeholders, share information, make decisions, explore new ideas, learn from each other, develop a plan and plan actions.

The Ketso approach was utilised in the focus group session for this study when participants were to determine the influence between the factors presented. Participants were presented with the factors on a rectangular shaped sheet and five different colours of sticky post. The colours represented the rating scale 1 - 5 (1: Pink - Very low, 2: Blue - Low, 3: Peach - No effect, 4: Lemon green – High, 5: Orange – Very high). See Picture 5.1 for illustration. Details on its application is provided in Chapter 8: Section 8.3.
The Ketso technique develops interactive and enjoyable sessions where participants gain confidence with the research objectives and tasks.

In reporting the level of focus group participants’ interaction in the analysis chapter of this study (Chapter 8), Belzile and Öberg (2012) continuum of use of interaction for focus groups was adopted utilising the medium level of use. At the medium level of use, although the focus of the researcher is on the content (output), some of the interactions were integrated into the analysis and the interactions were utilised to contextualise the content.

5.10. Data Analysis

This study collected a combination of qualitative and quantitative data. This section discusses the various approaches adopted to analyse the data collected for this study.
5.10.1. Thematic Analysis

Analysing qualitative data requires the researcher to make sense of the subjective and socially constructed meanings expressed by the research participants (Saunders et al., 2012).

Thematic analysis is a qualitative data analytical method for identifying and analysing (repeated) patterns or themes arising from the qualitative data sets (Clarke and Braun, 2013). These themes are important aspects of the data sets that relate to the research questions and enables the researcher to present a rich analysis of the entire data set. For instance, in this study, findings from observation and interviews on routine market activities and operations was used to describe the market custom regarding SWM practices in marketplaces, based upon reoccurring patterns of meaning.

To start off the analysis, the interviews for the study were transcribed verbatim and the field notes were compiled. Each transcript was then coded thematically in order to unveil relevant and emerging themes. The transcripts were further organised and analysed in order to identify themes, concepts and relationships within the data and also between the data and literature. The process was enhanced with the use of computer-assisted qualitative data analysis software – QSR NVivo 10 (see Appendix 7 for screen prints of data analysis using QSR NVivo 10). In line with ethical principles regarding participant’s confidentiality, participants for the interview were assigned codes instead of using their real names. Details of the participants and their assigned code is presented in Table 5.6.

Having reviewed and refined the themes originating from the data sets, the themes including extracts from the data sets were presented in a coherent pattern as results in Chapters 6 and 7 revealing the dynamics of the MPE and SWM practices of market users thus providing answers to the research questions.
Table 5.6: Details of Interviewees and Assigned Code

<table>
<thead>
<tr>
<th>Category</th>
<th>Sex</th>
<th>Age</th>
<th>Occupation</th>
<th>Participants Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>A – Buyers/Visitors</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>18-25</td>
<td>Student</td>
<td>ABV2</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>56^</td>
<td>Retired Nurse</td>
<td>ABV3</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>26-35</td>
<td>Receptionist</td>
<td>ABV4</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>18-25</td>
<td>Graduate</td>
<td>ABV5</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>18-25</td>
<td>Student</td>
<td>ABV6</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>26-35</td>
<td>Estate Surveyor</td>
<td>ABV7</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>18-25</td>
<td>Student</td>
<td>ABV8</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>26-35</td>
<td>Graduate</td>
<td>ABV9</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>26-35</td>
<td>Marketer</td>
<td>ABV10</td>
<td></td>
</tr>
<tr>
<td>B - Traders</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>18-25</td>
<td>Trader</td>
<td>BT1</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>45-56</td>
<td>Trader</td>
<td>BT2</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>26-35</td>
<td>Trader</td>
<td>BT3</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>18-25</td>
<td>Trader</td>
<td>BT4</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>18-25</td>
<td>Trader</td>
<td>BT5</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>26-35</td>
<td>Trader</td>
<td>BT6</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>26-35</td>
<td>Trader</td>
<td>BT7</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>36-45</td>
<td>Trader</td>
<td>BT8</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>36-45</td>
<td>Trader</td>
<td>BT9</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>26-35</td>
<td>Trader</td>
<td>BT10</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>36-45</td>
<td>Trader</td>
<td>BT11</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>45-56</td>
<td>Trader</td>
<td>BT12</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>45-56</td>
<td>Trader</td>
<td>BT13</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>26-35</td>
<td>Trader</td>
<td>BT14</td>
<td></td>
</tr>
<tr>
<td>C - Regulators</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>36-45</td>
<td>Chairperson Management Committee</td>
<td>CMC1</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>36-45</td>
<td>Chairperson Traders’ Association</td>
<td>CCMPE2</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>36-45</td>
<td>Chairperson Traders’ Association</td>
<td>CCMPE3</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>36-45</td>
<td>Chairperson market superintendent</td>
<td>CCMS4</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>36-45</td>
<td>Chairperson market superintendent</td>
<td>CCMS5</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>36-45</td>
<td>Personnel, RSESA</td>
<td>CSA6</td>
<td></td>
</tr>
<tr>
<td>D – Waste Handlers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>36-45</td>
<td>Waste Contractor</td>
<td>DW1</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>36-45</td>
<td>Waste Contractor</td>
<td>DW2</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>46-55</td>
<td>Waste Contractor</td>
<td>DW3</td>
<td></td>
</tr>
<tr>
<td>E – Sensitisation Groups</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>46-55</td>
<td>PR, Political Party</td>
<td>ES1</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>36-45</td>
<td>Manager, Beverage Company</td>
<td>ES2</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>26-35</td>
<td>Public health Worker</td>
<td>ES3</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>36-45</td>
<td>Manager, Microfinance Bank</td>
<td>ES4</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>46-55</td>
<td>Member, Primary Health Board</td>
<td>ES5</td>
<td></td>
</tr>
</tbody>
</table>
5.10.2. Relative Importance Index (RII)

The Relative Importance Index (RII) has been applied frequently in built environment research. The RII is a useful method when seeking to establish the impact or relative importance of a factor relative to others within a setting or model. RII has been employed by the following waste management studies: Omran et al. (2011), Williams and Turner (2011) and Adam et al. (2013). Also, Sambasivan and Soon (2007), Fugar and Agyakwah-Baah (2010) and Gündüz et al. (2013) adopted the RII method in built environment research to determine the relative importance of the various factors relating to delays in construction projects in Malaysia, Ghana and Turkey respectively. This method was also adopted for this study in order to determine the factors that should be prioritised in the management of solid waste in MPEs. This provides the market facilities manager with the knowledge of the relative importance of a factor over the other.

A five point rating scale ranging from 1 (Not Important) to 5 (Extremely important) was adopted in order to determine the RII for each factor using the equation as applied by Williams and Turner (2011):

\[
\text{RII} = \frac{\sum W}{A^*N}
\]

Where:

\( W \) is the weighting given to each factor by the respondents

\( A \) is the highest weight and,

\( N \) is the total number of respondents.

The RII value ranges from 0 to 1; a high RII value establishes the level of importance of a particular factor in relative to the other factors.

For this study, the RII was used to establish the relative importance of the factors that could enhance SWM practices of the market users obtained from qualitative data sets.
5.10.3. Severity Index

Severity Index (SI) has been effectively used by various researchers in the built environment in order to determine the effect of a particular factor in a system (Abigo et al., 2012; Chidambaram et al., 2012; Agboje et al., 2014; Sindhu and Gidado, 2014). In this study, the SI was adopted to analyse question three of the questionnaire survey: How would you rate the effect of the following factors on the attitudes of the market users towards waste? The mathematical expression and the scale on the rating of the issues in interpreting the degree of severity as adapted from Chidambaram et al. (2012) and (Agboje et al., 2014) is as follows:

\[ \text{Severity Index (S.I)} = \sum a \times \left( \frac{n}{N} \right) \times \frac{100}{5} \]

Where: 
- \( a \) is Weight or points assigned
- \( n \) is Number of respondents
- \( N \) is Total number of responses obtained for that variable

Where:

- \( 0.00 \leq \text{SI} < 12.5 \) implies extremely ineffective
- \( 12.5 \leq \text{SI} < 37.5 \) implies ineffective
- \( 37.5 \leq \text{SI} < 62.5 \) implies moderately effective
- \( 62.5 \leq \text{SI} < 87.5 \) implies very effective
- \( 87.5 \leq \text{SI} \leq 100 \) implies extremely effective

5.10.4. Interpretive Structural Modelling Methodology

The Interpretive Structural Modelling (ISM) was adapted for analysing the data generated from focus group discussions and exercise. Initially, thought was given to the use of statistical correlation – cross correlation. However, upon pilot analysis, I realised the use of cross correlation in order to determine the relationship between the factors that could enhance SWM practices was not suitable for the study. Statistical correlation also does not indicate whether or not the relationship between factors are direct or indirect and the cause underpinning
the relationship is unknown. The use of statistical correlation was thus ruled out based on this finding.

The ISM is a well-established technique created by J.N. Warfield that has been applied in various fields of study in order to determine and analyse the interrelationships and interactions among elements that define a problem (Jharkharia and Shankar, 2005; Ravi and Shankar, 2005; Wang et al., 2008; Chandramowli et al., 2011; Tuan et al., 2014; Poduval et al., 2015). The ISM methodology is an interactive process that involves decision on the relationship of factors within a system by a group of persons/experts who have knowledge of the problem being considered. It relies on the use of either surveys or idea generation techniques like Brainstorming, Nominal Group Technique, Delphi Method System, Focus Groups (Poduval et al., 2015). Based on the ordered, directional framework it provides (as output), it gives decision makers a realistic picture of their situation and helps them visualise and identify the nature of the barrier; high priority barriers, highly influential barriers, and barriers requiring additional attention and effort to address (Ravi and Shankar, 2005). The methodology is said to be structural as its outcome is an ordered directional framework based on an established relationship between factors (Mandal and Deshmukh, 1994).

The application of ISM methodology for this study was to determine the contextual relationship and the interaction between the factors that could enhance SWM practices. These factors were derived from qualitative data sets in order to provide recommendations that will enhance FM services in the MPE. The application of ISM will enable the development of a hierarchical structure detailing the nature of the factors. This will enhance the decision-making processes of the market facilities manager regarding SWM.

A focus group discussion and exercise was utilised in the application of the ISM methodology. Focus group was chosen over other idea generation techniques as the study could not guarantee anonymity of research participants and it was important to observe through this study whether or not there was power
imbalance between market stakeholders. These were some of the key features over the other idea generation techniques.

According to Poduval et al. (2015), the application of ISM gives answers such as;

- The interconnection of the factors, reflecting the direct and indirect linkages of the factors,

- The key factors to be considered while analysing the problem and also the factors that influence the system the least,

- Actions to be taken by management in addressing the factors.

One important feature of the ISM over statistical techniques considered for this study is that the ISM involves human component. As earlier stated (Section 5.9.4), the use of public participation in solving problems allows for sharing and discussions of the problem and also offers reasons for the choices made before arriving at a common ground.

In developing the ISM, various steps were applied. The steps laid out by Wang et al. (2008), Attri et al. (2013) and Poduval et al. (2015) were adapted for this study. The steps followed in developing the ISM model for this study is shown in Figure 5.2.
The steps presented in Figure 5.2 was followed in analysing the data obtained from focus group discussions and exercise (Chapter 8: Section 8.3).
An important consideration while analysing the ISM as stated by Chandramowli et al. (2011) is that the model should not be interpreted as a rigid flowchart that means the factors at the base of the diagram needs to be addressed before considering other factors. The model rather provides guidance for overall barrier management.

5.11. Ethical Consideration and Data Management

In undertaking research, there are a number of ethical principles that should be taken on board. The ethical concerns associated with this research were addressed in the manner defined by the University of Brighton’s School of Environment and Technology Research Ethics and Governance Committee before commencing with data collection.

Generally, the ethical issues pertaining to this study as a result of the methodology adopted includes;

- Confidentiality and protection of data and participants
- Covert observations
- Participant’s consent and right to withdraw
- Use of photos

In order to address these ethical concerns, I took the following actions;

- Participants were assured of confidentiality, thus pseudonyms were used for participants and places made reference to in the course of collecting and analysing data.
- Identified participants were handed consent forms and participant information sheet to be signed, confirming their consent to participant in the research. Consent forms, cover letter and participant information sheets amongst other information clearly stated the purpose of the research and assured participants their participation is voluntary and can be withdrawn any time without giving reasons for withdrawal. See
Appendix 8 for consent form, cover letter and participants’ information sheet.

- Interviews were conducted behind closed doors in the offices of the market and in the shops of the traders in the case of the remodelled markets. Where interviews were to be conducted at locations chosen by the participant (especially in the case of buyers/visitors), the interviewee was reminded of the ethical concerns and the researcher ensured the interview was conducted behind closed doors.

- Photographs taken for the study were of participants directly and indirectly involved in the study. However, photographs were reviewed in such a way that the members of the public were not put in a compromising position. Photographs were altered to ensure the identities of the members of the public is hidden. The essence of the use of photos is to enable the reader to have a clearer context of the MPE.

- Participants contact details was stored separately on a protected file from data collection instruments. Hard copies of data were locked securely in a privately owned cabinet at the University while soft copies were saved in protected files on a password protected computer that is accessible only by the researcher. Also, fieldwork logbook containing all correspondences, date and time of activities was kept and locked securely in a privately owned cabinet at the University.

- As regards the transportation of data (the study was carried out abroad), all data was transported in cabin luggage as oppose to checked-in luggage. This way, I was in control and aware of the position of the data.

However, due to the nature of the operations of markets, four of the interviews conducted with traders in the old markets were not conducted behind closed doors. This was because the traders would not accept any other location apart from their shop. This confirms the observation of Hill (1963) that the marketplace is one of the most inconveniencing and uncomfortable place to carry out fieldwork as the users of the facility especially the traders are more focused on trade related
transactions, making it quite inconveniencing to seek and receive their total attention. It was thus important to have an understanding of the perspective of the participants in order to accommodate and adapt to the research site.

5.12. Summary and Conclusions

This study is an exploratory research that adopts a sequential mixed model design. A multiple case study design with a pragmatist ideology was adopted for this study. Four cases were conducted for this study utilising a mixed data collection and analysis technique. Non-participant observation, semi-structured interviews, questionnaires and focus group were the data collection instruments utilised in this study.

Data collected for this study was analysed thematically and the process was aided by utilising QSR NVivo 10, RII, SI, and the ISM methodology. The RII was utilised in order to determine the relative importance of a factor over the others, whereas, the ISM methodology provides a structural influence model that can inform better SWM practices. Thus, the methods chosen have policy/practitioner relevance.

The ethical concerns associated with undertaking the study was mainly confidentiality and protection of data and participants, the use of covert observations, participants consent and right to withdraw from the study, and the use of photos. These were addressed before setting out to generate data and I also provided details on data management in this chapter.

The next three chapters present the analysis and results from primary data generated.
Chapter 6. Observations from Urban Marketplaces in Port Harcourt, Nigeria

6.1. Introduction

This chapter is the first of two chapters that presents and discusses the data generated from preliminary enquiries in the first primary data generation phase of the study. The data presented in this chapter is based on initial enquires with the LGC and market management, observations and semi-structured interviews. The purpose of the discussion in this chapter is to describe and provide an understanding of market life and operations, revealing the socio-cultural dimensions of the use and social expectations of urban market spaces. This chapter thus provides an understanding of the dynamics of the MPE so as to inform market facilities managers with contextual knowledge in order to improve SWM practices.

The chapter presents an account on the customs and beliefs of the market users in the use of market space, the interactions and influences that occur in the use of market space and how the practices of the market users shape their expectations of urban marketplaces. The chapter demonstrates that the market users exhibit some form of tacit understanding in their interactions and use of market spaces.

As proposed by BIFM (2014a), an understanding of the nature of these practices is important in order to provide market facilities managers with contextual knowledge of the MPE to enable effective FM service delivery (in this case SWM).

The chapter starts by providing the characteristics and condition of the cases studied. Marketplace activities and routines in the old and remodelled markets are presented in the second section revealing the cultural difference and social expectation in the use of the different markets. Afterwards, the influence resulting from the various interactions that occur within marketplaces is presented. Analysis on the remodelling of markets and its implication on market life is presented afterwards, drawing on its impact on marketplace customs and the use
of market space. The role of marketplaces as an avenue for information dissemination is discussed in the next section, revealing the centrality of the MPE.

Finally, the findings of the chapter were discussed drawing on key themes from the analysis: marketplace customs and practices, the use of market space, and the influence of marketplaces. This sets the context to providing an understanding of SWM practices in MPEs in order to address the challenges the study set out to address (see Chapter 7).

6.2. Characteristics and Condition of Case Studies

Upon initial enquiry before undertaking the first primary data generation for the second phase of the study, it was important to determine the following as already stated in Section 5.8.

1. The number of urban markets in Port Harcourt: It was established that Port Harcourt has a total of 10 authorised urban markets as presented in Table 6.1. However, there exist other markets (small sized, night markets) unaccounted for as they are termed illegal markets since they are not authorised by the local authorities. The markets presented in Table 6.1 are a combination of both single and mixed products market and operate daily (with exception to Sundays).

Table 6.1: Urban Markets in Port Harcourt
Source: Field notes, (2014)

<table>
<thead>
<tr>
<th>Market Name</th>
<th>Periodicity</th>
<th>Market Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creek road market (town)</td>
<td>Daily</td>
<td>Mixed</td>
</tr>
<tr>
<td>Fruit garden market</td>
<td>Daily</td>
<td>Fruits and Vegetables</td>
</tr>
<tr>
<td>Garri market</td>
<td>Daily</td>
<td>Single product</td>
</tr>
<tr>
<td>New layout market (town)</td>
<td>Daily</td>
<td>Mixed</td>
</tr>
<tr>
<td>Nkpolu oroworukwo market (mile 3 market)</td>
<td>Daily</td>
<td>Mixed</td>
</tr>
<tr>
<td>Ogbunabali market</td>
<td>Daily</td>
<td>Mixed</td>
</tr>
<tr>
<td>Rumuwoji market (mile 1 market)</td>
<td>Daily</td>
<td>Mixed</td>
</tr>
<tr>
<td>Spare part market</td>
<td>Daily</td>
<td>Single product</td>
</tr>
<tr>
<td>Timber market</td>
<td>Daily</td>
<td>Single product</td>
</tr>
<tr>
<td>Trans-Amadi meat market</td>
<td>Daily</td>
<td>Mixed</td>
</tr>
</tbody>
</table>

Based on the information in Table 6.1 and taking into consideration the criteria proposed by Miles and Huberman (1994) (see Section 5.5), two remodelled markets and two old markets were selected for the study. These cases have been identified to exhibit the research problem and are set within the research context.
In addition, these cases are within the core urban centre indicating they cater for a bulk of the needs of the urban population. The cases might not fully represent the profile of market life and practices in all Port Harcourt markets, however, it provides sufficient opportunity to identify and highlight the main practices and areas of concern within this study.

As at the time of this study, the Government had recently remodelled the physical structure of two markets. It was thus important to consider the remodelled markets in this study so as to compare its nature with that of the old markets in order to reflect any differences in their nature, use and settings. Figure 6.1 is a map of Port Harcourt illustrating the case studies.

**Figure 6.1:** Map of Port Harcourt City indicating Case Studies
After: Lonely Planet (2014).

For the purpose of this study the markets will be referred to as;

- Case study 1: Creek Road market – Old market (South)
- Case study 2: Mile 3 Nkpolu Oroworukwo market – Old market (North)
2. The structure of urban market management: In the urban areas, the State Government builds markets and then hands over the ownership of the physical structure to the LGC for its management. The LGC is in charge of the overall management of urban marketplaces and there are three main bodies in charge of the management of markets and market activities. The hierarchical organisational structure of the marketplace is represented in Figure 6.2.

![Diagram of Hierarchical Organisational structure of the MPE](image)

**Figure 6.2:** Hierarchical Organisational structure of the MPE
Source: Field notes (2014).

- **Market superintendents:** The LGC have their staff referred to as market superintendents whose offices are located in the marketplace. The head of the market superintendents is referred to as the ‘Chairman’ (for the purpose of this study, ‘Chairperson’ will be used). Their duties include amongst others; the allocation of stores, record keeping, collection of revenue (this includes monthly store rentage, sanitation and security fee), provision of a conducive environment, and addressing complaints arising in the marketplace. The superintendents report directly to the office of the Secretary to the LGC.

- **Management Committee:** The MPE also has a management committee that comprises of LGC staff but its chairperson is politically appointed by
the State Government. This committee liaises with the market superintendents in the allocation of stores and management of the MPE.

- **Traders Association**: The MPE has an association made up of a chairperson and 8 executive members. The chairperson and members of the executive are elected by the traders to oversee the welfare of the traders and also act as representatives of the traders in dealings with the LGC or other external consultations.

- **Market council**: This is made up of elderly and long-standing traders. They assist in decision making regarding market welfare.

- **Commodity association**: They fix the minimum price for goods for their members and ensure members adhere to the prices. They also look out for the welfare of their members and ensure members are there for each other by ensuring they attend each other’s social functions.

3. **The rationale of remodelling markets**: The Rivers State Government in 2013 completed the remodelling of two traditional urban market structures. According to the LGC and the State Government consultant on urban market remodelling, the State Government saw the need to remodel the market as a result of incessant fire outbreaks which eventually razed down both markets (Chinwo, 2013). Preliminary investigation indicated that, the key rationale of the remodelling was to; provide a more spacious market environment, provide modern facilities and address SWM concerns (Field notes, 2014). These points were usually also raised by politicians during election campaigns. For instance, during the campaign period of the 2015 Gubernatorial elections in Rivers State, the now elected Governor, while visiting one of the old markets, is quoted:

> “I am here to assure you that my administration will enhance your standard of living. Your markets are in this deplorable condition because of (mentions past Governor)…” (Vanguard, 2015).

However, the researcher’s persistent request to access the consultant’s report proved abortive.
6.2.1. Old Market (South)

The old market (South) is located in the core urban area of Port Harcourt known as 'old township' and within a residential hub. It is located by the waterfront and said to be established at about 1949 (Wolpe, 1974). As at three decades ago based on Wolpe (1974: p.19) description, old market (South) was not one of Port Harcourt's main marketplaces:

“...lies further towards the end of Port Harcourt peninsula and not being on the way to anywhere, has never been popular”.

Today, the old market (South) is one of the main markets in Port Harcourt City having a combination of lock-up and open stores estimated at 3,000. It is predominantly dominated by women of the Ijaw speaking tribe. The market is officially open for operations between 8:00am – 6:30pm daily except on special holidays - Christmas and New Years Day. The site on which the market is located appears fairly rectangular and covers a large land mass estimated at over two hectares.

The floors of the stores are made of concrete with a frame of dwarf sandcrete block and metal poles covered with corrugated iron sheets. See Picture 6.1.
The market is in six sections (see Figure 6.3 for market layout) and it is bounded in the South, East and West respectively by the Ocean, a low income residential estate (referred to as Abuja Estate), and the office of the National Examination Council (NECO).

The market sections mainly includes; yam zone, Abuja zone, provision and article zone, fresh fish and sea foods zone, dried fish and crayfish zone, fruits and vegetables. However, trading in other type of goods is seen within each of the sections. For example, garri is sold within the fruits and vegetable zone.

There are traders (allocated space) selling by the fence and hawkers mainly teenagers and young adults trading within this market space. The prime business in this market is in the sale of fresh fish, sea foods, and dried fish and crayfish.

---

9 Trade mostly in local gin, clothing and accessories, and meat
10 Beverages, breakfast
11 Variety of goods (more of stationery)
12 Staple food made from cassava tubers
Figure 6.3: Layout of Old Market (South)
A majority of the stores and sheds are not connected to the national grid supplying electricity and there are no public mains of water supply or independent water supply (borehole). Most traders that can afford it, have generators for the supply of electricity and traders who stay until dark (late evenings) rely on torchlights or bush lanterns\textsuperscript{13}. The traders rely on \textit{mai ruwa}\textsuperscript{14} or pure water\textsuperscript{15} for their daily water supply. The market is secured with a dwarf fence with space between for ingress and egress of persons and goods.

The market is serviced with open drainage (in poor conditions) and there are no car parks for shoppers. Shoppers park their vehicles along the market road or within spaces in close proximity to the marketplace. There are also no solid waste receptacles in this market. Waste is dumped at various corners of the market and in open drains.

The overall condition of the MPE is deplorable as it is characterised by very old and shabby sheds, congested space, uneven and muddy paths and external roads, open and filthy drainages, waste litters and fly dumping at various corners of the market. As a result of the deplorable state of the external road, traders display their goods on the road thereby obstructing vehicular movements.

Although the market is stuffy and congested, there is no particular foul odour as each section smells of the goods (especially foodstuff) sold there. However, because the market is congested and stuffy, the smell of foodstuff remains on the clothes of visitors and traders after leaving the market.

\textsuperscript{13} Lanterins with exposed flames fuelled with kerosene (paraffin)
\textsuperscript{14} People who move around with water for sale mostly in 20 litres jerry cans transported in hand pushed trucks
\textsuperscript{15} Sachet water which is usually 500 millilitres per sachet
6.2.2. Old Market (North)

Old market (North) is located within a commercial area in the core of the city and shares a boundary with a major and busy motor park. It is officially open for operations between 8:00am – 6:00pm daily except special holidays: Christmas and New Years Day. It covers a large land mass estimated at over two hectares. The market accommodates an estimated number of 600 lock-up stores and 520 temporary sheds. The temporary sheds are located in an open space where traders display their goods on tables with umbrellas to shield them from the weather condition. The market deals in a variety of goods but its sections are organised haphazardly. The only section well outlined is the building materials section, which is located at the entrance of the market.

A majority of the stores are not connected to the national grid supplying electricity and there are no public mains of water supply or independent water supply (borehole). Few traders own generators for the supply of electricity and the traders also rely on *mai ruwa*\(^{16}\) or *pure water*\(^{17}\) for water supply. A few section of the market is serviced with open drains and there are no car parks for shoppers.

The stores are a combination of single and storey buildings made of concrete block walls with roof covered in corrugated iron sheets. See Picture 6.2 and Figure 6.4 for photo of construction details and layout of old market (North).

As a result of the poor drainage system, when it rains, shoppers are seen wading in stagnant water and the overall condition of the stores are poor as they look old and dilapidated. The market is congested and there are no visible waste receptacles. Traders store solid waste by the side of their store on the ground, in plastic bucket or bags and the entire MPE is littered with solid waste.

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\(^{16}\) People who move around with water for sale mostly in 20 litres jerry cans transported in hand pushed trucks

\(^{17}\) Sachet water which is usually 500 millilitres per sachet
Picture 6.2: Construction Details of Stores in Old Market – North
Source: Field notes (2014).
Figure 6.4: Layout of Old Market (North)
6.2.3. Remodelled Market (South)

Wolpe (1974) describes this market as the main market located in Port Harcourt township with the stores highly sought after. However, as a result of fire incidence that razed down the traditional structure of the market, the market structure was remodelled to include modern facilities (Barasimeye, 2013).

Remodelled market (South) is situated in a residential-cum-commercial area in the core of Port Harcourt and it is in close proximity to the old market (South). It is open for operations from 8:00am – 6:30pm six days a week (Monday – Saturday) except on bank holidays. It covers a large land mass estimated at over two hectares and the site on which it is located appears firm.

The market trades mostly in packaged goods and has a combination of 1,600 lock-up and open space stores built on two floors. See Picture 6.3 and 6.4, and Figure 6.5 for constructional details and market layout.

Picture 6.3: Construction Details of Remodelled Market – South
Source: Field notes (2014).
Picture 6.4: Construction Details of Remodelled Market – South
Source: Field notes (2014).
Figure 6.5: Layout of Remodelled Market (South).
The remodelled market (South) has the following constructional details;

- Roof: Covered with long span aluminium roofing sheets.
- Walls: The walls are of sandcrete blocks rendered and finished with emulsion paint.
- Windows: The windows are fitted with double slide and single aluminium glass.
- Doors: The doors are fitted with a combination of wooden doors and roll down security grille.
- Floor: The floors are of concrete finished with terrazzo.
- External floor: The external area is finished in interlocking tiles.

And is serviced with the following facilities and services;

- Toilets
- Water (internal borehole installed on premises)
- Electricity from national grid
- Generator (Not yet in use as at the time of this fieldwork).
- Covered drains
- Car park
- Fire service station
- Fire hose and extinguishers
- Banks
- Dispensary
- Refuse dump area
The market is secured with sandcrete block fence and double leaf metal gates and has multiple entrances. The overall condition of the MPE appears satisfying and convenient for shopping.

6.2.4. Remodelled Market (North)

This market is located within a commercial area and is in close proximity with old market (North). The market was established in the late 1930’s and used to operate once a week – mainly Saturdays trading only in food stuffs (Brown et al., 2015). However, the market has evolved to be one of the busiest markets in Port Harcourt and is open for business between 8:00am – 6:00pm, six days a week (Monday – Saturday) except on bank holidays.

As a result of fire incidence that razed its traditional structure, the structure of this market was also remodelled to meet modern standards (Ejibas, 2015). The remodelling of this market is being carried out in phases as work is yet to commence on the second part of the site.

The market has a total of 930 lock-up stores with the following constructional details (see Picture 6.5 and 6.6);

- Roof: Covered with long span aluminium roofing sheets.

- Walls: The walls are of sandcrete blocks rendered and finished with emulsion paint.

- Windows: The windows are fitted with double slide aluminium glass.

- Doors: The doors are fitted with a combination of metal double leaf and roll down security grille.

- Floor: The floors are of concrete.

- External floor: The external area is finished in interlocking tiles
**Picture 6.5:** Construction Details from Front View of Remodelled Market – North
Source: Field notes (2014).

**Picture 6.6:** Construction Details from Rear View of Remodelled Market (North)
Source: Field notes (2014).
The market is serviced with the following:

- Toilets
- Water (internal borehole installed on premises)
- Electricity from national grid
- Covered drains
- Car park
- Dispensary
- Fire hose and extinguishers
- Banks
- Cafeteria
- Refuse dump area

The site on which the market is located is fairly rectangular in shape and covers a land mass estimated at over one hectare. It is built on three floors and comprises of lock-up stores. The market is organised in sections (see Figure 6.6 for layout) with the ground floor comprising mostly of kitchen wares, plastics, household utensils, furniture covering, and dry food stuff.

The traders on the first floor trade mainly in toiletries and fast moving consumer goods such as noodles, cereals and beverages while the traders on the second floor trade mostly in clothing and accessories.

Shoppers pay a token to park their cars within the MPE. Also, the building is constructed with waste chutes at the rear that channels waste from the upper floors to the waste dump area on the ground floor.

Generally, the MPE is in good condition and offers shoppers a convenient environment for shopping.
Figure 6.6: Layout of Remodelled Market (North)
6.3. Marketplace Activities and Routine.

6.3.1. Old Markets

Typically, even though markets are officially open for operations at 8:00am daily, activities at the old market (South) though minimal begin as early as 6:30am. Traders, mostly females and those with sheds by the market fence or a shed in front of the locked areas, were seen arriving at the market, with most of them accompanied by their children. A handful of them were seen with chewing sticks\textsuperscript{18} in their mouth as they arrive at the market with a few arriving with goods in their hands and on their head. Upon arrival the traders were seen setting up their sheds which involves sweeping and cleaning round their environment before displaying their goods with some of them already making sales at that time of the day.

Supplies/deliveries arrive in vans and taxis and a few early shoppers could be spotted then. It is quite difficult to get all you want at that time of the day except for pre-arranged meetings. A majority of the shoppers seen between 6:30am and 7:30am seem to be focussed and relaxed and not moving from one store to another. Mai ruwa’s\textsuperscript{19} were seen supplying water to traders. Mostly children and women were seen transporting their waste stored in buckets and plastic bags, with some of them using hand pushed carts to both authorised and unauthorised collection points within the MPE. This is waste from the previous day as they were yet to unpack their goods for the new day. Also, a few informal waste handlers were seen transporting waste in hand pushed carts from the surrounding environment to both authorised and unauthorised collection points in the marketplace. Lots of carriers were seen transporting goods in wheelbarrows or on their shoulders for traders and a few buyers who have made purchases. Lots of the carriers who use wheelbarrows were seen stationed at advantageous places, chatting and waiting to be called upon but no sign of eagerness on their

\textsuperscript{18} Teeth cleaning twig
\textsuperscript{19} People who move around with water for sale mostly in 20 litres jerry cans transported in hand pushed trucks
faces at this time of the day. These carriers were mainly Hausa men from Northern Nigeria popularly called *aboki*\(^{20}\) (See Picture 6.7).

![Picture 6.7: Images of Carriers in Markets](image)

*Source: Field notes (2014).*

Between 7:30am and 8:00am, lots of children and teenagers between the ages of five and 16 were seen in school uniforms emerging out of the marketplace and heading for their various schools. Very loud music can be heard from a few stores by this time of the day.

At about 7:45am, lots of traders, the majority of whom were dressed in shabby outfits, were seen trooping into the market, some of whom were in hurried steps, others chatting at the top of their voice. A few buyers were seen at this time too, relaxed and moving around doing their shopping. At first thought, it could seem

\(^{20}\) It means ‘my friend’ in Hausa language but in Southern Nigeria it is used to refer to men from Northern Nigeria that undertake menial jobs.
that the traders were shabbily dressed as a result of their social status or poverty. However, upon further probing, a trader addresses why they are dressed in a particular manner in the extract below:

“Because of how the market is built, our way of dressing shows that this is Nigerian market. Because we don’t dress as if we are going to our office, we are going to in short (in fact) like a dirty place; we are going to a dirty place” - BT2.

This position is not only held by the traders as a waste handler also relates their view on the subject:

“When you prepare to go to the market then you have to have a change of clothes in order to go there. You can’t even wear your good shoes” – DW1.

Thus, it can be deduced from the extract above that the appearance of the traders is as a result of the condition of the marketplace. See Picture 6.8 showing the appearance of users of old markets, and Sections 6.2.1 and 6.2.2 for description of the condition of old markets.
The old market (North) is officially open for business at 8:00am daily. At about 7:45am lots of traders, predominantly women, were seen strolling into the market and chatting while they await the opening of the market gates. At 8:00am, when the market gates are open, the traders were seen sweeping, tidying up and packing up their waste for storage either in cartons, nylons or on the ground by the side of their sheds before displaying their goods.

As early as 9:00am the old markets get very busy, congested, rowdy and noisy as shoppers troop in their numbers until about 5:00pm. This results in both human and vehicular traffic. Within this period of the day, the users of the market tend to be in a rush especially the traders and carriers. The carriers constantly utter the word chance\(^\text{21}\) to market users whose pace is not as fast as theirs. Users of the

\(^{21}\) Make way
market who make abrupt stops to exchange pleasantries were most often aggressively told off. Most often, this results in the exchange of angry words between the parties involved. Traders, most of whom are teenagers and young adults who are not store owners, were seen hawking their goods, most often politely stopping buyers/visitors and persuading them for patronage. The majority of traders who have displayed their goods along the road on the ground were seen calling buyer/visitors at the top of their voice with some of them ringing bells and advertising their goods in songs or loud talk. The gesture is different from that of traders selling in their sheds as these traders were more relaxed and were either chatting with their neighbours (fellow traders), a visitor seated in their shop, a prospective buyer or sorting out their goods. Once in a while they politely beckon on shoppers uttering words like ‘customer buy o’.

In the old markets, apart from trade transactions, activities going on varied widely. Various organisations and individuals were stationed at various strategic points of the market introducing or advertising products, programmes and preaching with the use of megaphones. Some organisations move from one end of the market to the other with the use of vehicles fitted with megaphones and playing very loud music to advertise their products while a few station their vehicles at a strategic position to advertise and sell their products.

Transactions were mostly carried out in pidgin or local vernacular and the cost of goods and services was not fixed; that is no price tags on goods or price list. Shoppers are expected to price in order to arrive at a favourable price for whatever goods or services needed. A trader describes this phenomenon as a classic component of the Nigerian market in the extract below:

“The thing that makes up markets in Nigeria is how we arrange our market. We don’t have fixed price for things. We will bid price and you

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22 A polite and friendly way of persuading shoppers
23 Simplified version of English language and broken English
24 Haggle or give counter offer
25 Goods
will price and then we arrive at a particular sum, that’s Nigerian market” - BT2.

The extract above implies that the better your bargaining power, the more goods you might be able to purchase. However, there seems to be a minimum amount fixed by each commodity association as traders can be heard telling buyers “that is our price”. The use of the word ‘our’ is believed to be a referral to the commodity association.

Typically, there were barely scales for measurement in markets, as goods especially foodstuff (both wet and dry) were either measured in tin or plastic cups/buckets or in the case of meat cut in bits and sold depending on the amount it was purchased by the trader.

The quantity of loose waste comprising mostly of plastic bags especially pure water sachets, husk and stems of vegetables littered all over the market increases during peak periods. The majority of the traders leave their waste exposed and unattended by the side of their goods. The old markets were mostly covered in mud, thus very marshy when it rains (see Picture 6.9).

**Picture 6.9: Marshy Ground in Old Markets**
Source: Field notes (2014).
Between the hours of 2:00pm and 4:00pm, children in their school uniforms were seen most often chatting and playing while they walk into the market.

At about 5:30pm, the old market (North) becomes less congested, traders begin to round up and pack up goods not sold for storage. At 6:00pm, the traders were seen leaving the market, a few of them carrying their waste in plastic bags, cartons and baskets heading towards the location of the placement truck for waste. Whereas, in old market (South) trade continues up until about 6:30pm when the market is less congested and then traders were seen packing up their goods for storage. Although unauthorised by the LGC, new sets of traders who trade mainly in fruits, vegetables and seafood were seen setting up their goods for display by the fence of the market with the use of bush lanterns as their source of lighting. The evening trade continues until as late as 9:00pm -10:00pm depending on the patronage.

The traders tend to carelessly clean and tidy up before packing their goods and leaving. This has an implication on waste management as there is no monitoring or control over the trade activities at night and the traders the next morning are faced with more waste generated the previous evening.

6.3.2. Remodelled Markets

Traders start arriving for business at about 7:50am and the gates to the market are open for business at 8:00am. Upon gaining entry, the traders were seen sweeping and tidying up their stores before displaying their goods. A few of the traders head towards the waste disposal area with their waste stored in plastic buckets, plastic bags or cartons while the others store their waste generated in the morning within their stores in plastic buckets, plastic bags or cartons or in a small heap by the corner of their store.

The scenario is quite different in the remodelled markets as they were not congested or rowdy, much quieter than the old markets and the outfit of the traders appear neat. Trade transactions are not carried out in loud voices and the

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26 Lanterns with exposed flames fuelled with kerosene (paraffin).
disposition of the shoppers and visitors appear relaxed. When traders are not engaged in trade transactions, they were seen either chatting in small groups, playing a table game, discussing with visitors seated in their shop or sorting out their goods.

The peak period in the new markets is between the hours of 11:00am and 4:00pm, however, the market seems less congested or noisy then because the market is spacious and can contain the population. However, the new markets were not usually as populated by visitors and buyers compared to the old markets as the new markets offer more of packaged goods and household items while the old markets trade more in local foodstuff. Thus, the old markets tend to be highly populated, and this brings more acute pressures in terms of SWM and disposal.

The remodelled markets possess a different atmosphere. No more than one organisation can be seen at a time using megaphone or loud music to introduce their product or programme in the remodelled markets. It seems this is so organised in order to reduce the noise level and maintain the social norms and expectations of the space as more organised and regulated. However, a few organisations or individuals were seen having a one-on-one discussion with the market users.

In remodelled market (South), on Thursdays between the hours of 9:00am to 10:00am, the traders were gathered for a meeting with the market leaders. The market leaders use this opportunity to pass on information to the traders and also remind them of market regulations. Other issues discussed during such meetings were the welfare and complaints from traders.

At about 5:45pm traders were seen packing up their goods displayed in front of their stores. Several traders were seen gathering up their waste in old or broken plastic buckets, cartons and plastic bags, and heading to the waste disposal area before shutting their stores at 6:00pm.

Informal waste handlers were seen between the hours of 6:00pm and 6:30pm every other day in the remodelled market (North) evacuating waste with the use of wheelbarrows to the stationed compactor trucks of the waste service providers designated for the marketplace.
6.4. What brings about influence between Stakeholders in Marketplaces?

Between the periods of daily operation at the marketplace, numerous interactions occur among the various stakeholders. These interactions could be between; traders themselves, traders and shoppers, relatives and visiting friends, the management/union of the marketplace passing on information to traders, the Government (whether at Federal, State or Local level) passing on information, friends or relative meeting accidentally, private businessmen or organisations and Non-Governmental Organisations (NGOs) passing on information. The interactions vary depending on the participants. Information provided by organisations cover a range of areas: family, sports, health, societal and political concerns. Some interactions, especially those regarding football and politics, were in loud heated arguments and the participants were mainly male.

Below are some extracts from interviews conducted on the non-trade related interactions that occurs between stakeholders:

“Going to get something in the market you will not just go and tell the person give me this and you walk away. Sometimes you might have interest in the person and sometimes maybe the environment where the person stays to sell. It might not be appealing to you, you might want to talk to the person about it… You must definitely talk about something different or maybe ask questions about how the business is going” - ABV4.

“Yes, most times we have visitors in the market, they come to visit us. We discuss about our families (be)cause most times we don’t have the time to go to families and discuss anything. Because we are always occupied at the market, we call them to come to the market (be)cause we will be too tired to visit them at home when we are back from the market. Most times we have conversations about our church, children, if we have enough time to discuss it at the market, we do that” - BT2.

“We discuss other things, many things like now Nigeria they are playing football (World Cup 2014) we can argue and discuss. And also discuss what is happening in Nigeria now, because everybody is seeing what is
happening now; Boko Haram\textsuperscript{27} and the rest of them, problems here and there and then politics and other things. So we discuss many things here in order to pass time then when a buyer comes you go and sell” - BT8.

“Yes, some of the stakeholders are like my fathers and mothers while some are friends. Ermmm for the elderly stakeholders, we discuss other social issues, family issues you know” – CCMS4.

“When I go there I lecture them on food hygiene; the importance” – ES3.

The extracts above reveal the presence of frequent non-trade related interactions between the users of the marketplace. These interactions seem to be significant components of the marketplaces. This reveals that the use of space in marketplaces is not essentially about trade. However, the trade environment is a driver that stimulates the interactions and activities that takes place in the MPE.

Also, the extract “because we are always occupied at the market, we call them to come to the market (be)cause we will be too tired to visit them at home when we are back from the market” suggests the traders spend long hours in the market and further reveals the busy nature of markets.

6.4.1. Types of Influence Resulting from Marketplace Environment

The primary data generated also reveals that the frequent interactions and activities results in two main forms of influence;

1. Influence between stakeholders: A certain level of influence originates as a result of the friendship and loyalty based on frequent interactions between stakeholders in the MPE. This influence could be between traders themselves, traders and the market superintendents, traders and buyers/visitors or between sensitisation groups and the users of the MPE. This is revealed in the extracts below:

“Ermmm dumping of refuse that should be ermmm I could just say, Ma, don’t throw it there na why not just put it there you know. It may be

\textsuperscript{27} Terrorist group in North-East Nigeria
effective, it may not be but at least I’ve said what I have to say. And then if I see her next time I could just say it again; Ma, if you don’t do this I won’t buy again from you next time o, you know” - ABV5.

“For example maybe if I go shopping then the way people especially my customers personally the way they arrange their waste products I tell them, why don’t you have a waste bin and arrange it somewhere? I try to tell them even though if not all will take it. I try to tell them” - ABV7.

“At the marketplace there are different characters, there are some traders if you price their goods low they will shout at you, for example my mother behaves in that manner. But I always try to talk to her and now she has changed from that harsh behaviour of shouting at buyers that price her goods low. Even my friends that sell around me, I talk to them, because I don’t talk to buyers in that manner, so I talk to them to be nice to buyers and now they’ve changed” - BT3.

“They’ve (the traders) influenced positively my behaviour you know. They’ve made me to be more patient with very foolish people. And to an extent I’ve also influenced their behaviour. You know the average market person is being seen as a wayward person, somebody who’s not responsible by way of our people’s perception. So they look at a market woman as someone who can quarrel everywhere you know and the market man as someone who has a bad mouth28 you know. If you as a girl if you just come into the market, they will just want to hold you, and when you stop that, he will use abusive words and all that. So I’ve influenced them to an extent to let them know that they should not accept what people say they are by portraying it. So it’s a two-way thing” - CCMS4.

The extract above reveals the relationship and influence between buyers and traders, between traders themselves and between the market regulators and the traders. The influence that exists between the stakeholders especially the buyers and traders seem primarily as a result of frequent purchases made by the buyer.

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28 Foul-mouthed
As a result of these frequent purchases, traders tend to exhibit some form of loyalty with such buyers in order not to lose their patronage. However, the buyer’s statement “I try to tell them even though if not all will take it” reveals that there seem to be active relationships between buyers and traders which results in influence on one another and this influence is not dependent only on patronage. Thus, it can be deduced that the relationship between buyers and traders is not primarily passive and patronising but also active, and this can influence environmental behaviours related to waste.

2. Influence from market activities: Data obtained also reveals that interactions with the MPE have an impact on its users.

The positive expressions of the stakeholders tend towards the programmes introduced at marketplaces by various organisations ranging from health, personal hygiene and sanitation, and political programmes. Below are some of the positive extracts:

“Sometimes I go to the market and I see advertisement going on in the marketplace talking about cleanliness. I see people like the (mentions a brand) and other ermmm soap companies they come to the market to sensitise people, even I’ve seen people from Ministry of Health coming to the market to tell them about cleanliness. So in that way, it will also help me to learn” - ABV6.

“Sometimes these sanitation people they come and talk to us about waste; cleaning up. So we learn something from there. And as we learn from them, the way they teach us to clean when we go home we clean also” - BT9.

The extract reveals the programmes organised within the marketplace tend to have an impact on its users. The users of the marketplace have contact with these programmes as a result of their usage of the market space. This influence thus stems mainly as a result of such programmes being introduced in marketplaces which is regarded as a focal point of the society basically as a result of the large number of persons that have contact with the marketplace.
However, despite the positive impacts made as a result of interaction with the marketplace, a few stakeholders have reservation as to the type of influence the marketplace has on its users.

“Sometimes it can be mostly in the negative way that’s how I see it…. Like people that sell in the market that bring their children to the market to stay with them, you find out that their behaviour is different if they were to be kept in the house with someone to care for them. They have some kind of attitude that is not good, will not be good rather outside that marketplace. And when you see somebody say you are behaving like a market woman\textsuperscript{29}; maybe somebody will just sit down and open leg, maybe that’s the way they sit in the market and a child or a teenager learn that attitude because that place is just a free place so the negativity is more than the positivity that’s how I see it” – ABV4.

“It irrespective of the positive things we benefit, the marketplace can also contribute a whole lot of things; noise and other environmental factors that (..) even health hazard” – DW1.

It is evident from the extracts that inasmuch as interactions with the marketplace offers some form of positive impact on its users mainly as a result of the programmes channelled via the marketplace there were also reservations as to the type of influence. Some of the stakeholders were of the opinion that despite the positive impacts derived from the interactions with the marketplace, the marketplace also has negative impact on its users.

Also, the influence that arises through the interactions between the market users and MPE, to an extent has an influence on the users outside the MPE. Evidence from the data generated suggests that the users of the market tend to incorporate information obtained from the MPE into their daily lifestyle outside the MPE. This could be information by hearing or by what they see as they interact with the MPE. This is evidenced in the extracts below:

\textsuperscript{29} A derogatory term based on the perception of the society. It basically means someone who is ill-mannered
“Let’s start from the negative way; people that are (..) especially those that ermmm stay more hours in the market they buy things maybe while eating they throw it around even when they get to the house or in an organised place they still have that attitude of immediately they finish eating they just throw things anyhow (indiscriminately)” – ABV7.

“All these people that come here to pass information; keep your environment clean, wash your hand after using the toilet, use antiseptics for your bath water. I practice all of these at home, I don’t throw it away (be)cause it is important” - BT8.

“Ermmm yes, like there was a time these health personnel they came to supervise the goods if it has expired or not. And so if they see any expired goods they will carry it. So it made me to be vigilant…that if I’m going out to buy other things I need to check these expiring date, I need to say oh let me see, or when did you buy it, the production date, so it has affected my attitude a lot in that aspect” - BT10.

The data above reveals that the MPE has an impact on the users that interact with the environment. There tends to be a relationship between the MPE and the ‘home’ (outside the MPE) as information and activities were taken outside the MPE. However, the impact of the programmes as revealed by some of the users of the marketplace also depends on who is giving the message. A trader relates;

“Depends on the kind of people, for example, organisations come in and don’t live up to expectation” – BT13.

This again relates to the norms in the use of the market space and the social expectations of the market users. The traders have existing belief as to the level of impact expected from organisation that disseminate information via the marketplace.

6.5. The Impact of Remodelling on Market Life and Operations

With the on-going remodelling of market structures, markets seem to wear a new physical look. They have a new structure, appear cleaner, more spacious, not rowdy and were equipped with facilities such as water, electricity, toilets, clinics,
fire station, and car parks, which were not available in the old markets. The design and presence of these facilities were in line with the key rationale of the State Government in remodelling markets (as stated in Section 6.2).

Several respondents were of the opinion that the remodelled markets were more spacious, have support facilities that enhance market activities such as water, electricity, car parks and waste disposal area. This implies that the rationale of the remodelling is being met (as stated in Section 6.2). Below are some of the extracts from the stakeholders regarding the rationale of remodelling being met:

“Personally if I want to do some kind of shopping, I prefer going to the new market. Because (..) especially when I drive down (be)cause there is parking space, it enables me to move around and do things better than in the old markets where there is no parking space, nothing, everything is just scattered” – ABV7.

“…If you go there (remodelled markets) now, they built car parks and many things. Even borehole, like now in our market we don’t have borehole because they’ve not rebuilt the market but the new market the Government has rebuilt it so they have car parks, they have borehole, all these facilities like toilet that the market users need. Then inside the market is in sections for example if you sell books, provisions30 they are separated so that there is space, goods are not mixed up in a section. And really yes they have space in that market now, if you go you can park your car in the market now and there’s water but here we buy mai ruwa31” – BT3.

“To some extent I will say yes. It’s so designed in such a way that they have receptacle within the market, that is for waste disposal of which the refuse truck will just drive in there and empty the receptacle and go. So I think that’s some standard if we may call it” – DW3.

30 Groceries
31 People who move around with water for sale mostly in 20 litres jerry cans transported in hand pushed trucks
“Yeah, it (the rationale of remodelling) is being met because over the years it was more or less like a ritual that during the Harmattan\footnote{Cold-dry and dusty trade wind usually experienced between the months of December – February} period we find market go up in flames so easily and it became like a ritual that we expect in January or December to hear that one market is burnt\footnote{Razed by fire} the other market is burnt. So Rivers State government started building markets that are properly structured but most importantly with safety in mind. You see these safety exits now in markets, you will see water hydrants now in markets because the problem we have is when there is fire outbreak, you’ll see that people die not because of the fire incident but because of stampede. So all these are taken care of in today’s market” – ES1.

The extract above indicates multiple social benefits of the reorganisation of market space and these benefits were articulated by the various stakeholders according to their interest. For instance, the buyer/visitor is more concerned about an environment that eases shopping experience, the trader is concerned about the facilities such as toilets, water and parking space that would enhance trade activities and reduce the burden on traders whereas the waste handler is particular about the facility that enhances waste management operations.

However, despite the fact that the remodelling of markets is positively welcomed, some stakeholders expressed reservations about the social impact of the remodelling in the extracts below:

“For me it’s (the rationale of remodelling) not being met because I think first of all the market they built was meant for the masses but right now it’s being occupied by the wives of politicians that already have good grounds but the poor market woman that was there before is no longer there and these people are now selling on the streets, so their aim is not being met at that length” – ABV6.

“For example the remodelled market (North) was remodelled so it can accommodate more people, it is called ultra-modern market, you
understand. But the ultra-modern market from what I understand, people that are trading are more than the space they provided as shops, that’s why most of the traders moved to a field and built temporary structures to trade in. And the rent for the shops is too expensive for the people (..) like now most of the stores are still vacant because the rent is too high. Also, it’s built on different floors and the way markets operate, before people upstairs will make sales those downstairs might be through with sales, hope you understand the difference now. Before people upstairs can sell it means they have something people downstairs do not have. So because of that, most people at the remodelled market (North) do not want to be upstairs except they use it for storage” - BT8.

The reservations above reveal that, although the Government has improved market conditions, the rationale is being forfeited as traders do not have access to shops as a result of the shops being too expensive, not available for rentage or space inappropriate to establish market customs (the design of the remodelled structure). Also, it can be deduced that the Government have not included all stakeholders in the redevelopment consultation process as to the design and settings of markets taking into consideration the input of the stakeholders especially the traders. Thus, even with the provision of a conducive environment that enhances market life, some of the stakeholders were of the opinion that the reduced number of shops in the new markets, the high cost of rentage and the design of the markets structure preclude the significance of the remodelling. Considering marketplace custom in terms of use of space, this to an extent makes the new markets ‘not fit for purpose’.

Also, some of the stakeholders have mixed responses regarding the rationale of the remodelling being met. Below are some of the extracts:

“For Rivers State Government to make more space is good but the Government did not follow the traders’ report to build the market. Let the Government take advice. We told them the number of shops and the design we want. The shops before were 1,081, because of the congestion people made complaints so Government can add additional stores. When
the store got burnt\textsuperscript{34}, the present Government provided temporary space for shopping. But the Government did not build the current market to expectation in terms of number of stores. Now we have 1064 stores" – BT13.

“Some of them (traders) one reason or the other they have not been able to move down to the new buildings. For example, the major challenges of some people that have not been able to move in there is finance. The shops there were not built free; so some of them have not been able to move in there. So it’s not 100% (..) they have not really met the demands of people or achieved what people really wanted. So far so good they have tried” – DW2.

The extracts above correspond to the reservations expressed by stakeholders on the subject in terms of the high cost of store rentage and space in terms of reduced number of stores in the new markets. However, the extract also reveals other concerns such as the lack of consultation and hence a lack of understanding of customary market practices on the government’s part which would have been considered in the planning process. It can be argued that the Government incurred high costs in building the markets; remodelled market (South) and remodelled market (North) cost the Government 3.5 billion\textsuperscript{35} and 3 billion\textsuperscript{36} naira respectively to rebuild (The TIDE, 2010; Barasimeye, 2013).

However, markets are usually built by the Government with a developmental objective for the populace to create wealth and employment (Nwosu, 2008; Abey, 2011). Thus, the primary aim of building markets is mainly not for monetary returns but developmental purposes.

When further probed as to the stakeholder’s involvement and input in the remodelling of markets, responses from the various stakeholders revealed that several of the respondents were either not consulted or were not sure their

\textsuperscript{34} Razed by fire
\textsuperscript{35} Equivalent of £12 million
\textsuperscript{36} Equivalent of £10.4 million
opinions were properly represented by their leaders – their association or market regulators.

Below are extracts from the interviews:

Consulted:

“Yes, they consulted the people that were in those markets but they didn’t consult me. They told them of the plan to remodel and there was a little disagreement because some of the people were happy with the remodelling while others weren’t. The people that were against it claimed if the government remodels the market they will claim all the stores like what is happening now” - ABV3.

“Well new market case, yes, they are supposed to consult them, they called a meeting. Like now, they want to build this market, they’ve called me in a meeting with the commissioners, they called me personally and later they called me again and I took at least some of my kinsmen here, six of them. Are you getting me? They have to consult us. They don’t just come in and one day and to ermmm bulldoze, no, no, they don’t do it, they are not mad people” – CCMPE2.

Not consulted:

“They did not consult us. But I believe they took a leaf from the model of markets in other countries” - BT2.

“Ehmmm I was not ehmmm really involved but I know the State Government they are human beings. The Government we have today is a listening government…So we were not consulted to say put this in place, no, we did not make that. All we told government was let us have a permanent structure for our markets” - CCMPE3.

“Everything about structure of the new market is done by consultant” – CCMS5.

37 Own and control
Not sure:

“Uhmmm, I can’t say yes or no (be)cause they might have asked the people in charge but I don’t know much” - BT6.

“That will depend on the union because it’s not everybody that will go to the government. We have heads that do that for us if necessary” - BT7.

From the extracts above on the subject of stakeholder’s involvement, it can be deduced that there are contradicting statements between even the regulators of MPE as to whether or not they had an input in the design and construction of marketplaces. Some of the responses were based on perception as to what is expected of the Government. Also, responses from the traders and waste handlers reveal that they were not consulted in the design and construction of the new markets. The traders, however, were also under the assumption that their leaders might have been consulted.

Based on the extracts, the reservations and mixed comments of the stakeholders regarding the rationale of the remodelling being met can be said to be interrelated to the non-involvement of the stakeholders during the design and construction of new markets. Thus, it can be concluded that the non-involvement of the stakeholders in the process of remodelling has resulted in the production of market structures that do not meet the needs of the stakeholders, especially the traders. This finding is corroborated by the global World Bank (2009b) study on the reconstruction of public live markets, slaughterhouses and meat processing facilities. Findings from this study revealed that although the newly constructed facilities offered more space and improved access to road and services, the reconstructed markets remained unoccupied as traders preferred the temporary illegal markets because the new markets were solely unsuited for the structure of the local market and its stakeholders coupled with rental cost.

Based on the findings above, it was important to determine whether or not the remodelling of markets has had an impact on market life and operations.

Several of the stakeholders were positive about the impact of the remodelling on market life and operations. The stakeholders relate the impact below:
“Yes, definitely because at least the rowdiness let people know that (..), you know we, what we notice is that as if were market is a place that is full of noise everybody is on the loud talk; how much is this? You no dey buy?\textsuperscript{38} Come buy o, you know, it’s not there for now. So you will make your choice, you take a look, walk and it’s a quiet discussion between the buyer and the seller unlike the other one that people are shouting come come come madam come, see see see see, oh no! Some are ringing bell you know, those things are not there again so I think it’s good. The remodelling is good and welcomed” – ABV3.

“Yes, the thing has affected the way markets operate because there are some personnel who are coming in here to buy, it was not so before when we were in our temporary place. They were complaining about parking space and all the rest and they were complaining about the environment; you know environment matters a lot. So now people are coming here and most people are comfortable” - BT11.

“Definitely it has, because it makes available (..) that people even when you are coming from your work you can easily branch\textsuperscript{39} in the market and get some things. So it makes the marketplace more organised and it creates access - it’s accessible to all. Because in those days you have the belief that market is not something you just come, when you prepare to go to the market then you have to re-dress\textsuperscript{40} but because of the provision of the new facilities and the organisation, it makes the (..) any person to just branch in the marketplace...So it has really added value to the marketplace. The environment, the ground, the way the place is organised” - DW1.

“Serious impact of course. The amenities make the marketplace neater than what used to be. Before now we don’t have (..) like I said (..) waste disposal (..) a particular place for waste disposal but now I think

\textsuperscript{38} Won’t you buy?  
\textsuperscript{39} Make a stop  
\textsuperscript{40} Have a change of clothes
Government has provided place, there is a particular place for waste disposal. Where you have a point where all the market people go to dispose their waste” – ES4.

Again, these positive responses are interrelated to the positive responses on the rationale of remodelling. Based on the positive responses, it can be deduced that the remodelling of markets has provided users of the market with a comfortable and neat environment that enhances the shopping experience. In this regard, it can be assumed that the rationale underlying the remodelling has been met. Also, the market structure and environment to an extent has had an influence on its users especially in waste handling and communication pattern (there is no longer loud communication thus reducing noise pollution).

A significant finding from the statement “what we notice is that as if were market is a place that is full of noise everybody is on the loud talk…You no dey buy?41 Come buy o, you know, it’s not there for now. So you will make your choice, you take a look, walk and it’s a quiet discussion between the buyer and the seller unlike the other one that people are shouting” reveals a cultural change in the manner the market space is consumed. Also, the statement “it makes the marketplace more organised…because in those days you have the belief that market is not something you just come, when you prepare to go to the market then you have to re-dress42” reveals a change in belief as to the use of market space.

However, the remodelling of markets has got some negative impact on market operations which is most severe on the traders based on their responses:

“Actually, something changed and it affects some people. (Be)cause when they were about to demolish the market it affected many people, many people went back to their village, some people lose their goods, some people lose their business, some people also lose their shop. So after demolishing when they built the place, they hand over the shop to other

41 Won’t you buy?
42 Have a change of clothes
people so some people lose some certain things while they are not supposed to lose it. Like the way we trade before when we buy goods, we will sell it, when you sell you will have some little interest on it but now when you buy goods even though you buy one bag of rice, you will sell that bag of rice up to two or one month, which is not fair, everything changed, the market changed automatically” - BT1.

“Yes it has changed, yes it has. For example, some people that come from far like the white men that come to buy things from the market, now it took them about six years to rebuild this new market close to us, so right now some of them don’t know that the market has been completed. So business does not flourish there now because most of the people that usually shop there are not aware that the new market now exist, so business in the new market does not flourish apart from people that live around there that tend to shop there” - BT3.

“Yes, the design of climbing upstairs. Before now the old design even if you are upstairs, you will be able to access all the stores upstairs. Now, people cannot move from a store to another without climbing up and down. This has affected stores not to be taken upstairs and customers don’t like climbing up and down. The job man\(^{43}\) cannot climb up to carry goods” – BT13.

The extracts above reflect social issues of displacement and loss of livelihood owing to the demolition and reconstruction of the new markets. And this is exacerbated by the high rental cost of stores and the reduced number of stores produced after the construction of the new markets. The concerns also draw on the issues of accessibility based on the design of the new markets. These responses again to an extent are interrelated to the non-involvement of the stakeholders input in the design of markets. Also, the responses are correlated to earlier reservations by the traders on the rationale of remodelling being met.

\(^{43}\) Carriers
A few stakeholders expressed mixed opinions regarding the impact of remodelling on market life. Their concerns were on the impact on the price of goods and the unintended externalities resulting from the remodelling of markets. For them, the high rental cost has had an impact on the prices of goods, making it difficult to convince a buyer to make purchases. Also, traders were forced to trade elsewhere, especially along the roads as a result of the high rental charges on stores. However, they were of the opinion that the remodelling has enhanced the shopping experience, as the weather conditions were no longer a thing of worry since the entire market has a covered roof.

Based on the stakeholder’s responses (negative and mixed responses), it can be deduced that the negative impact on the remodelling of markets is most severe on the traders. The areas of market life and operations affected by the remodelling is mainly on: increase in price of goods, loss of source of livelihood as a result of inability to pay store rental charges or non-availability of stores to rent, non-rental of stores as a result of the design of the market structure (built on floors), trade does not flourish (slow business) as people were not aware that the remodelled markets were fully operational. This again reveals a lack of consideration of market custom in the redevelopment process. A key aspect of FM is the knowledge of the facility in order to be efficient in FM service delivery. As revealed in Figure 2.1, this entails knowledge of the four components that make up the facility.

There seem to be an issue with social norms and expectations observed between markets. While the remodelling of markets is received by some of the stakeholders as a welcome development, there seem to be issues with the design of the new markets and the social effect of the remodelling on market life. For instance, with the remodelled markets there is an issue of access to split floor markets. The effect of these changes on SWM practices is discussed in the next chapter.
6.6. The Market as a Conduit for Information Dissemination

Apart from on-going trade activities, various individuals and organisations were seen in marketplaces relating and passing on information to the market users. These include preachers, product companies, health workers and organisations and banks. Below are extracts of some of the programmes introduced at the marketplace:

“In terms of politicians, when its election time lots of them come here, gather the traders and tell us the benefits of voting for them; they will tar our roads, reduce the rent on stores, some of them even give us money” - BT8.

“We do national campaigns – immunisation campaigns. One of them is the national immunisation plus days. We do maternal, new born and child health weeks and local immunisation days, you know and so on” – ES5.

Every day, various individuals and organisations were seen at the market introducing and disseminating various programmes and information respectively to the users of the market.

In the extracts below, the sensitisation groups detailed how often they use the marketplace to introduce programmes or disseminate information.

“Right from time the market place has been a very source of big catchment area for political parties. That is why (...) you might investigate- you find out that people like (mentions a renowned Nigerian politician) became very popular because his mother was the president general of all the markets in Lagos and she controlled the big markets in Lagos and so because she controlled the big markets in Lagos and mainly women were and are still very powerful in that sector, she was able to through them showcase the son and then got political power and then through the association of market women she was their leader, she led. So often times there is no season of election that political parties don’t find time to reach out to the market people” – ES1.
We are regularly in the market. We just finished one in the month of March/April, so we are running frequently. Yeah you know I belong to launching company\textsuperscript{44}. So in that regard we are always in the market – ES2.

When probed further as to the reasons why the marketplace is considered as a channel to introduce programmes or disseminate information, below are some reasons given by the stakeholders:

“…You know it is a very busy place. We want to get mothers involved in whatever we are doing and you find so many of them there. So it’s just part of the strategy really to mobilise our women. Like I said you have many women, women and children are our targets. So wherever our target is, we go there” - ES5.

“Our type of product is service oriented and the marketplace is where we can serve a greater number of people” - ES4.

“I doubt whether there is any small family or even the larger family that does not have one or two persons that do business- in any case every family goes to the market. So it becomes a rallying point. It becomes one of the easiest points where you make contact and for you to change people’s behaviour you require enormous contact and the marketplace provides one of the most veritable points of contact” – ES1.

From the extracts above, there are varied reasons why the marketplace is considered as an avenue to introduce programmes/products and disseminate information. Data obtained reveals that the large number of persons that visit the market daily and the target population were the key reasons the marketplace is considered as an avenue to introduce programmes/products and disseminate information. The extracts also reveal that the market is still a focal point of the society till date.

However, it was observed that, not all individuals or organisations had the attention of the users of the market while introducing products/programmes or

\textsuperscript{44} A company with new products
disseminating information. In some cases, the users of the markets were seen gathered at the point where the information or programmed was introduced, other times traders could be seen paying apt attention from their stores while buyers/visitors stopped from time to time when the message caught their attention. However, in other cases, the individual or organisation went on with their activity without much regard as to whether or not they had the attention of the market users. This was most often the case when the messages were gospel sermons or when programmes were introduced via moving vehicles fitted with megaphone.

Various groups were asked about the strategy employed to gain access to the users of the market in other to disseminate information or introduce programmes/products. Responses obtained revealed the market leaders play a vital role in the dissemination of information or introduction of programmes/products in marketplaces. Information is either passed via the market regulatory body or the regulatory body ensures easy flow of information by encouraging and ensuring their members participate. The medium is used mainly by organisations who want broader participation that ensure they channel their programme/product via the market regulatory bodies. Organisation whose products/programmes require a one-on-one (private) discussion or less attention of the market users need not channel theirs via the market regulatory bodies.

In disseminating information or introducing products/programmes, various organisations employ different strategies and techniques. Some organisations set up a mini stage in the market and play loud music in order to gain the attention of the users of the market. Some go as far as introducing dancing or quiz competitions about their products and give away prizes too. Image of a typical scenario is shown in Picture 6.10.
“Usually what we start with to gain acceptance is we work with the associations involved. You meet the head of the market, you meet the women groups in the market, you tell them the reasons why you are there. You get their permission before you go ahead to do anything” - ES5.

“You don’t just go there and begin to talk generally. First of all, essentially you hammer on issues that impact on them, on their business. Like I told you earlier you need to tell them why or what you will do (..) your policy will result in terms of benefit to them, in the business they do. There’s nobody in the marketplace that buys and sells that does not have any child or somebody he or she is looking after who is not in school. So, you also
pass issues of children to them. So through that you will still pass other information” – ES1.

“One thing we do as we go there at times we do activities because if you don’t do activities people will not know what you are doing” – ES2.

The participants also gave reasons for employing such strategies or techniques as follows:

“That way it makes it easier for all to co-operate with you” - ES5.

“We use that strategy because it’s easier; it is a better strategy to move from the known to the unknown. Move through what benefits the person directly before you can reach what benefits him remotely. So as an entry strategy you use that to really get their attention. Then when you have gotten their attention you can preach other things, which may not impact on them directly but in the overall impacts on them” – ES1

The extracts above reveal that, there is an organised system of communication in markets. It also reveals organisations intending to disseminate information at marketplaces should have an understanding of the marketplace operations – the people, the setting in order to be successful.

6.7. Discussions and Implications

Findings from observation of markets have revealed what the old and remodelled markets have in common and relate to one another, and how they differ. The data presented throughout this chapter reveals three major themes in providing an understanding and the dynamics of the marketplace: marketplace customs and practices, the use of market space, and the influence of marketplaces.

6.7.1. Settings of Urban Markets

The characteristics of the old markets are no different from the African markets described by Jerome and Ogunkola (2000) and Oloto and Adebayo (2011), whereas the remodelled markets were revamped with modern facilities like markets in Barcelona (Costa, 2013). Figure 6.7 has been developed based on observation on the settings of the case studies. The concept is drawn from
Chapter 2: Section 2.4 and 2.5 and Chapter 3: Section 3.5. Figure 6.7 illustrates the typical settings of the markets studied for this research. It reveals the detailed description of the setting, facilities, services, inputs and outputs of the MPE. Drawing from the conceptual model of a facility (Figure 2.1), Figure 6.7 illustrates that the MPE encompasses four components and as such can be analysed as a facility. The obvious difference between the old markets and remodelled markets is in the building, facilities and infrastructure component. The old markets were characterised by dilapidated structures, lack of facilities, and have a congested environment whereas the remodelled markets have better structures and were provided with facilities such as water, electricity, parking space, toilets, and waste disposal areas.

Despite the differences in infrastructure and facilities, the markets observed were affected by similar external factors. The external factors that influence the functioning and activities of markets was derived from observations and interviews with the research participants and these typically includes; competition, natural disaster such as flooding, insecurity, economic factors such as inflation.
Figure 6.7: Conceptual Model of the MPE
6.7.2. The Dynamics of the Marketplace – The Interactions and Influence Resulting from the Use of Market Space

Data sets reveal that there exist active relationships between the traders and buyers in both old and remodelled markets. This is not necessarily dependent on patronage and this results to some level of influence. These repeated dealings result in a significant influence between the stakeholders especially the traders and buyers. This also has an influence on SWM practices as the stakeholders knowledgeable in SWM were able to influence other stakeholders' practices. This is in line with the views of Jerome and Ogunkola (2000) that repeated dealings, friendship and personal loyalty between the stakeholders play a role in influencing the behaviour of market users.

A commonality between the old and remodelled markets is in the activities and interactions that occur in the use of the market space. Data sets reveal that markets are multi-dimensional; besides trade activities there exist non-trade activities and interactions, market customs and practices, and the cultural expectation in the use of market space, and these shape how markets operate. These non-trade interactions and activities results in a significant influence between the stakeholders especially the traders and buyers. FM emphasises the importance of understanding the facility; the nature, purpose and use, and the environment it exists in (Atkin and Brooks, 2014). Thus to assume the role of market facilities manager, there is need to have an understanding of the multi-dimensional nature of markets and a focus on the norms and cultural expectations as they shape the use of the market space.

The use of market space by various organisations to introduce their programmes and products reveals the significant role of marketplaces within the society as it is an environment that has the presence of various target population, especially women. As a result of the various information, communications and programme interventions that take place within market spaces, the marketplace tend to have an influence on its users. Data obtained reveals that the market regulators play a crucial role in successful intervention programmes as organisations gain access to the traders via the market regulators. The use of leaders were also strategies
employed in health oriented intervention programmes (Loosli, 2004; WHO et al., 2006). This reveals that the market regulators have a significant influence on the traders and thus raises questions as to how much of this influence is exerted in order to effect better waste management practices in marketplaces.

The relationship between the marketplace and home (outside the MPE) is also revealed in the old and remodelled markets as users of the market transfer information obtained in the market outside the MPE. This is in line with important findings of the study by Ladipo et al. (1990) which involved traders taking (research) products home to sell to family and friends.

**6.7.3. Social Expectations and Cultural Change in the Use of Market Space**

The remodelling of markets comes with expectations and change in norms of the market users. There is a tacit understanding in the manner of dressing and conducting trade or other activities. For instance, in contrast to old markets, trade transactions in the remodelled markets were carried out in quiet conversations and the traders do not call for buyers at the top of their voice, or advertise their goods in loud talk or songs, or with the use of bells. The market users do not dress shabbily in the use of this space. This has changed the initial belief of market environments being noisy and congested, and the manner of (poor) dressing. The difference in the atmosphere between the old and remodelled markets reveals how the market users perceive and consume the different spaces. It also reveals difference in the expectations and perception of the market users in the use of space. There is thus a ‘characteristic’ way of thinking and feeling in the use of the different market spaces (Inglis, 2005). These beliefs, values and tacit understanding in the use of the different markets according to Gudeman (2001), becomes the culture of the old and remodelled markets.

Also, there is a difference in the use of space by the various organisations. The number of organisations that disseminate information to market users using loud techniques such as megaphones or loud music in the remodelled markets is limited to one organisation at a time. This maintains a low noise level and a less rowdy environment. On the contrary, various organisations were seen at the same time in old markets using megaphones, loud music, cars fitted with loud
music and megaphones to disseminate information to the market users. This results in a rowdy and noisy environment.

According to Schein (1984), these changes in the beliefs and practices of the market users were the unconscious and taken-for-granted belief that shapes the thoughts and perception of market users.

The extent to which these cultural changes impacts on SWM practices is revealed in Chapter 7.

### 6.7.4. A Case for Inclusive Redevelopment of Markets

Data obtained also reveals that the marketplace custom and operations in terms of use of space was not duly considered in the process of remodelling of marketplaces. There were contradictory statements and various perceptions as to whether or not the stakeholders were consulted in the remodelling of markets. Findings from interviews reveal the lack of consultation and understanding of customary marketplace practices has resulted in the production of markets that have not met the demand of the market users, especially the traders. The key issues resulting from the lack of consultation and lack of understanding of marketplace custom includes: social issues of displacement and loss of livelihood owing to the demolition and reconstruction of the new markets, accessibility based on the design of the new markets - an issue of access to split floor markets, high rental cost resulting in increase in prices of goods and street trading. Thus, even with the provision of a conducive environment that enhances market life, the design of the markets structure precludes the significance of the remodelling. This to a degree makes the remodelled markets 'not fit for purpose'.

This is in line with the findings of global World Bank (2009b) report. The report revealed that although the newly constructed public live markets, slaughterhouses and meat processing facilities offered more space and improved access to road and services, the reconstructed markets remained unoccupied as traders preferred the temporary illegal markets because the new markets were solely unsuited for the structure of the local market and its stakeholders coupled with rental cost.
6.7.5. A Cue into Solid Waste Management Practices

Although the waste storage is the same in both old and remodelled markets, there is considerable difference in the handling and disposal of waste. In contrast to remodelled markets, the old markets were characterised by waste littered and dumped at various corners of the market. Observations reveal marketplaces were busy and were at the peak of transactions and other non-trade activities between the hours of 9:00am up until 5:00pm. It is thus a custom that waste is disposed of mainly in the mornings. Traders do not attend to their waste until they close for the day or more often before the start of trade activities the following day. This has an implication on SWM practices and raises concerns as to how much of marketplace custom is taken into consideration while developing waste management strategies for marketplaces.

Findings and discussions on SWM practices are reported in detail in the next chapter.

6.8. Summary and Conclusions

The analysis and discussions presented in this chapter have provided an understanding of the peculiar nature of the cases studied. Findings in this chapter reveal the customs and beliefs of the market users in the use of market space. This chapter has thus provided an understanding of the socio-cultural dimensions of the use and social expectations of urban market spaces. This provides answers to the first research question and objective of the study respectively (see Section 1.3.2 and 1.3.3).

Observations reveal the physical environment, facilities and services in the old markets were in huge contrast in comparison with the remodelled markets. The remodelled markets seem to offer a convenient and pleasant environment for shopping in contrast to the old markets. Waste from MPE is given proper consideration as solid waste facilities were provided in the remodelled markets. Although not a perfect system, there is a considerable difference in the handling and disposal of waste in the remodelled markets when compared to the old markets. However, analysis on the impact of the remodelled markets on market life and operations reveal the lack of consultation and understanding on the
Government’s part of marketplace custom and practice and as such the organisational and regulatory properties of marketplaces were not implemented in the new spaces.

The BIFM (2014a) provides that, to enable efficiency in FM service delivery, the facilities manager must have an in-depth understanding of the facility. This chapter thus provides a basis to inform the market facilities manager with the prerequisite and contextual knowledge of the MPE to aid effective and improved performance of the MPE. It sets the context to providing an understanding of SWM practices in MPEs in order to address the challenges the study set out to address.

The next chapter will provide analysis and discussions on SWM practices in MPEs. The key themes resulting from this chapter that provides an understanding of the dynamics of the marketplace: marketplace custom and practices, the use of market space and the influence of marketplaces, will be discussed in line with implications on SWM practices. The themes will be further examined as to whether or not they have an implication on SWM practices in MPEs.
7.1. Introduction

The previous chapter has provided an understanding of the dynamics of MPEs. Key findings from the previous chapter have revealed human geographies of the MPE; the importance of customary practices, social attitudes and operations, the different uses and perceptions of the space, and the influence of social interaction to the management of the facilities. This chapter presents data obtained via observations and semi-structured interviews on SWM practices in marketplaces. It presents findings from empirical work in relation to SWM practices and the reviewed literature in Chapter 4.

Solid waste is a recurring theme in the management of facilities, however for the marketplace (especially in African context), it has not been given considerable attention. Studies have tagged the attitudes of the users as a key factor militating adequate SWM practices (Agwu, 2012; Balogun, 2012). Furthermore, Taiwo and Ajayi (2013) in a study that focused on SWM practices of market users revealed that illiteracy, ignorance, negligence and laziness were the key factors that influence the attitudes of the traders towards waste. However, there is still a need to determine what factors underpin the attitudes of the market users. Barr (2007) argues that it is important to have knowledge of these underlying factors before addressing structural barriers that need to be in place.

This chapter presents an account on SWM practices of a range of different market stakeholders; traders, buyers/visitors, MPE regulators and the waste handlers. The practices of SWM in marketplaces is presented in the first two sections of this chapter. Subsequently, the impact of the remodelling of markets on SWM practices is presented. The challenges faced by the MPE regulators and the waste handlers in the management of solid waste in marketplaces is presented afterwards. The 10 factors that would enhance the SWM practices of the market users and the reservations of the market users regarding enhancing SWM practices in MPEs is presented and analysed. Finally, the findings of the chapter were discussed reflecting on the key themes presented throughout the chapter.
This chapter thus provides a more in-depth and sophisticated understanding of attitudes towards waste in marketplaces.

7.2. Solid Waste Management Strategies for Marketplaces

In Port Harcourt, the Rivers State Environmental Sanitation Authority (RSESA) is responsible for waste management. However, the collection, transportation and disposal of waste is outsourced to the private sector as stated in the RSESA law and confirmed in the interview by an official of RSESA:

“What we have as an authority done is to delineate the entire State and assign to service providers (private firms) who cover each zone so assigned. And then we regulate their services” – CSA6.

Based on the extract above, the collection and final disposal of solid waste in Port Harcourt is outsourced to the private sector. Each private service provider (waste handler) is assigned a zone for the collection and final disposal of waste and the RSESA regulates their practices to ensure efficiency.

The outsourcing of SWM roles (collection and final disposal) by the RSESA is in line with the laws that established the Authority (see Section 4.7). Outsourcing the collection and disposal of solid waste is a long term practice that has existed for over two decades in most Nigerian cities (Ogu, 2000). It is still a practice within Nigerian cities, for instance Abuja (Adama, 2012), Lagos (Agboje et al., 2014), and Ilorin (Ezebilo and Animasaun, 2012).

Upon further enquiry, the official of the RSESA relates that, the four urban marketplaces being studied were serviced by three waste handlers as the markets fall within their jurisdiction/zones.

In providing waste collection services for marketplaces, the waste handlers described their waste collection method below:

“The strategy for the marketplace is one; sensitise them to bag their waste. The other part is we tell them the appropriate position where they can equally dispose this waste (between six and seven in the evening) so that when we are evacuating them it won’t be a whole lot of task” – DW1.
“What we do is that in the evening time we bring out our trucks, we do what is called truck placement. We have enlightened the market women that look we don’t want your refuse to be put on the ground, immediately the truck arrives go straight to the truck and put all your dirt” – DW2.

“What we do there is this truck placement. By five in the evening, our truck is there and then we try to enlighten them too to bag their refuse. So if for instance before we get there they dump anything on the ground, it becomes a lot easier” – DW3.

Based on the description by the waste handlers, the waste collection method for marketplaces is in two approaches;

- Truck placement – the waste generators are expected to store their waste (preferably in bags) up until evenings and then dispose their waste where the truck is stationed,

- Evacuation of waste at authorised areas – the waste generators are expected to dispose their waste at authorised areas for it to be evacuated by the waste handlers.

The key issue here is implementation concerns based on the collection method by the waste handlers, especially with the truck placement approach. Kassim and Ali (2006) highlighted the implementation issues with the waste collection method employed by the waste handlers in collecting waste in Dar es Salaam city, Tanzania. The collection method was a door-to-door approach however, the approach was marred by the availability and condition of collection trucks. Findings on this study revealed that the end users commonly stored waste outside in small old containers which were inadequate and without a cover. This eventually results in littering and the creation of unhygienic conditions as the waste is exposed to different weather conditions. Although, different from the approach adopted for the markets, the containers used for waste storage were similar and this raise questions as to what happens when the trucks were not available to collect waste.
Lack of consultation and communication with end users regarding SWM is credited as a key factor for poor SWM practices (Palczynski, 2009). Olaseha et al. (2005) revealed that communication and involvement of traders in developing waste management strategies for the market resulted in a better implementation of the waste management strategy.

In determining the level of communication in terms of consultation with the market users (traders in particular) before implementation of the waste collection methods, the waste handlers disclosed that the market users were not always consulted before decisions were made regarding waste collection services. However, decisions to aid waste management practices such as bagging of waste were passed on to the market users via the market leaders. One of the waste handlers gave an example of closing unauthorised collection points as an example of a decision that does not require consultation with the stakeholders. In further explaining the decision, the waste handler states:

“Some of the places we feel it’s not okay to dump dirt, we don’t inform the market stakeholders we just go ahead and stop the dumping of waste there and direct them to the proper place to dump the dirt” – DW2.

The use of discretionary power by the waste handlers can complicate waste management practices, with some decisions requiring consultation and other actions taken without consultation. The use of the words “some of the places we feel it’s not okay to dump dirt” reveals proper consideration is not taken into account as to why and what is responsible for the actions of the waste generators. Also, the use of the words “we just go ahead” suggests the use of discretionary power; a decision based on the waste handler’s perception as to what is right for effective management of waste at the marketplace, therefore suggesting that the waste generators were not duly considered. This is in contrast to the study by Guerrero et al. (2013) which recommended that in order to have a well functioning waste management system in cities of developing countries, communication transfer between the various stakeholders is of high importance. This study supports the recommendation of Guerrero et al. (2013) for adequate
communication and involvement of stakeholders in the development of SWM strategies.

The position of the waste handlers also reveals the use of a top-to-bottom approach in the management of waste in marketplaces. The waste handlers barely consult with the end users (the waste generators) in making decisions regarding waste in the marketplace. This approach has very often failed in the management of waste at marketplaces as revealed in the study by Olaseha et al. (2005). The use of a top-to-bottom approach in the management of waste also confirms the findings of Palczynski (2009) that the involvement of stakeholders during the decision-making and throughout the waste management process is an important element that is lacking in African societies.

In describing the waste management practices in marketplaces, the market leadership (Heads of traders’ association and market superintendents) revealed that they carry out a weekly market sanitation on Thursdays from 8:00am to 10:00am. It is a mandatory exercise set out by the State Government for all urban marketplaces (Bibor, 2014). During this period all markets in the city were shut and traders were not to make sales or display their goods. The traders were expected to clean up not only within their stores but the entire market environment and waste is disposed at designated areas for the waste handlers to evacuate. The introduction of market sanitation suggests that the traders do not clean properly each day at the end of trading activities. Market sanitation exercise is a common practice in most urban markets in Nigeria including Lagos (Okoli, 2015), Ibadan (Adedeji, 2015) and Abeokuta (Olayinka, 2015).

The sanitation efforts were not uniform across all marketplaces in Port Harcourt, however, it is observed that a majority of the traders who partake in the sanitation exercise in the old markets were those whose sheds were sited by the fence or by the open drainage. Whereas in the remodelled markets, the turnout for the weekly sanitation is different as the traders clean up the market environment. The Chairperson market superintendent for one of the remodelled markets revealed:
“Traders pay a fine of ₦500\textsuperscript{45} for not meeting up with sanitation before 8:45am” – CCMS4.

This suggests that the sanitation exercise in the remodelled markets is better monitored than in the old markets and the introduction of fines serves to discourage traders from leaving the responsibility of cleaning up the market to their colleagues.

In terms of payments for waste management services, there is a discrepancy as to who is responsible for payments. Three bodies were mentioned as regarding responsibility for waste payments; the State Government, joint undertaking by State and LGC, and the traders. Drawing from the extracts and the position of the RSESA, the State Government is financially responsible for waste management. The representative of RSESA reveals:

“That is an area where I must tell you is relative (..) it’s quite very poor but we are moving that way. Generator has to pay for their waste but right now it’s more of a service handled by the State Government and it’s coming with a lot of financial commitment to keep the city clean” – CSA6.

Section 28 of the Environmental Sanitation Law provides that the RSESA could prescribe a fee for waste management services, subject to the approval of the State Governor. However, the above extract implies that the State Government is financially responsible for waste management services. This includes, amongst others, the provision of waste infrastructure and the payment of contracted waste management services.

Further probing revealed that, in all markets, the traders pay an annual sum called ‘sanitation fee’ in the sum of ₦1000 (equivalent to £3.40). According to the Chairperson market superintendent, this amount is remitted to the RSESA as payment for waste management services in the market. This then contradicts the statement of the RSESA personnel regarding financial responsibilities for waste management services.

\textsuperscript{45} Equivalent of £2
As regards penalties for defaulters of waste management regulations in markets, extracts from the interviews with the market regulators reveals that the penalty varies:

“There is a fine imposed by the union (Trader’s Association) for those that dump indiscriminately or those that don’t come out for sanitation. Sometimes they face the (State’s) sanitation court” – CCMC1.

“Sometimes we don’t collect money but we lock your shop for two days” – CCMS4.

The locking up of a trader’s shop has a monetary impact on the trader as they are unable to make sales for the period the shop is locked. Again, based on the social status of the traders (a mix of low and middle income earners), as with monetary penalties, this will have a huge monetary impact on the traders as they are unable to realise profit for the days they do not carry out trade transactions. Also, the extracts above reveal that the marketplace environmental regulations were contained and guided by the State’s Environmental Sanitation Law (Laws of Rivers State of Nigeria, 1999). However, there seems to be no implementation of these regulations on waste management practices especially in the old markets as they were characterised by littered waste and fly dumping.

7.3. Solid Waste Management Practices in Marketplaces

This section discusses SWM practices in the old and remodelled markets. The section is divided into two subsections in order to provide SWM practices in both market types.

7.3.1. Solid Waste Management Practices in Old Markets

The waste collection method in old market (South) is evacuation of waste at authorised collection points, whereas in old market (North) the collection method is by truck placement. Based on observation of the old markets, the difference in collection method is as a result of accessibility. Although both markets are

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46 Section 37 subsection (2) of the Environmental Sanitation Law provides that sanitation offenders will appear before the magistrate court
congested, the external road of the old market (South) is barely used by other motorists apart from market deliveries. The road is in a deplorable state, congested with the vehicles of market users, and because of the lack of care shown to the environment here, it is deemed appropriate to dispose waste there. The physical setting of old market (North) is such that there is no room for the waste handlers to designate authorised collection points or spaces for vehicular accessibility.

The old markets were characterised by littered waste on the ground and in open drains. Old market (South) has got fly dumping at various corners of the market especially along the external roads of the market as illustrated in Picture 7.1.

**Picture 7.1: Fly Dumping in Old Market (South)**
Source: Field notes (2014).

Picture 7.1 reveals that the disposal of waste at unauthorised collection points were in close proximity to traders that sell by the fence of the market. This clearly illustrates the significance of addressing SWM concerns in marketplaces as this has an impact on public health.
In the old market (South), between the hours of 6:00am and 7:00am, lots of traders were seen, the majority of whom were women. Most times the women were accompanied by their children or unaccompanied children transporting their waste stored in old plastic buckets, baskets, plastic bags, cartons to both authorised and unauthorised collection points within the marketplace. Whereas the old market (North) is open for operations by 8:00am and at this time the traders were also seen, sweeping and tidying up their store. They store their waste either in cartons, old plastic buckets and bags or on the ground by the side of their sheds before displaying their goods.

Within the periods of 8:00am – 5:00pm, traders tend to be busy with trade activities and dispose their waste on the ground around their sheds or store them in open storage such as plastic buckets, baskets, plastic bags, cartons. Waste is seen overflowing from the storage containers to the ground and sometimes the internal road of the market. It is common practice to see traders in the old markets carrying out trade transactions oblivious to the amount of waste around them, most of which is generated by the trader emanating from the goods they sell. Occasionally, traders who occupy spaces close to the open drains were seen sweeping directly into the open drains. Also, a few buyers and visitors were seen disposing their waste on the ground, in open drains and nearby unauthorised collection points. Plastic bags especially *pure water* bags, husk, leaves and stems were common types of waste littered in the marketplace as shown in Picture 7.2.

When probed about their waste management practices, the traders shared the same view indicating time to be a significant factor in waste handling in marketplaces. One of the traders categorically states:

"Ermnm it’s because (..) although you can go in the evening to dispose waste but because of time you cannot generate waste now and go to dispose it and again government place a law you dispose waste by six o’clock" – BT8.

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47 Sachet water which is usually 500 millilitres per sachet
Convenience and collection times were key issues raised by the stakeholders regarding their waste management practices. The extract above reveals that the timing for waste disposal is inconveniencing as a result of the busy nature of market activities. These were significant factors responsible for the act of indiscriminate disposal and the poor handling of waste by traders. These factors were also established in the study by Ogwueleka (2009), Regassa et al. (2011) and Ayuba et al. (2013) as one of the factors responsible for the inefficient SWM practices in African cities.

Also, responses from stakeholders suggests a lack of knowledge on the part of the traders as regards appropriate waste management practices. This raises concerns as to issues of monitoring by market leadership to ensure waste is handled appropriately by traders within and around their sheds.
When compared with their waste management practice at home, the traders tend to have a different approach as they each gave similar responses stating they had waste storage containers and dispose their waste at an authorised time and location. Below is a typical extract of the traders:

“In my own house I have waste bucket or basket, when I finish cooking I keep something like waterproof close to me. Any dirty\textsuperscript{48} that I bring out I put it inside that waterproof. So when I’m through with everything, then I will take the dirty out, I put it in the waste bin. When I see all these REFCOs\textsuperscript{49} I give them the dirty” – BT1.

When further probed for their reason for handling waste in the manner at home, the traders gave reasons such as to avoid the odour, restriction on illegal dumping, to avoid pest and health concerns. A trader further explained:

“Why I don’t dispose it anyhow, if I do that it will affect me. If I generate waste now and throw by my window it will affect me and everybody living there. The smell, the odour, it will pollute the area as in mosquito and the rest, so it’s not good” – BT3.

From the extract above, the sentence “it will affect me and everybody living there” reveals the ‘respect’ and ‘responsibilities’ attached to the use of different space. Massey (2005) posits that spatial identities are continually moulded through daily negotiation within the space. It reveals the expectations conceived in the use of space and how people are shaped by the use of space. Thus, the different consideration to home space and the marketplace. In Nigeria, as in most developing countries, household waste management concerns centres more around approaches to waste disposal. The key issues are environmental concerns relating to the sorting of waste before disposal, disposal of waste in different locations such as uncompleted buildings and undeveloped plots, in rivers, waste is buried, or by the road (Achi et al., 2012; Stanley et al., 2012).

\textsuperscript{48} Waste
\textsuperscript{49} Acronym for Government agency formerly responsible for collection of waste. Most people now refer to waste handlers as REFCO
Further investigation also revealed the practice of re-use and recycling by traders within the marketplaces. Materials such as cartons, plastic bags, shells of seafood, remnants from dried seafood, plastics and bottles were the common materials re-used or recycled in old markets. A trader explained how some of the materials were re-used:

"Me, I practice it (re-use and recycling), and I know people that practice it. For example, people that sell seafood. The shells they don’t throw them away, most times they use it for feeds\(^{50}\) and they use it for developing land\(^{51}\). For example, the shells of seafood and groundnut shell they use it for poultry, even our crayfish shafts\(^{52}\) – BT2.

Discussions with traders revealed that, the traders do not necessarily have knowledge of these elements (re-use and recycling) of waste management or understand the implication of their actions regarding waste management. Rather, discussions with traders revealed that these practices were based on economic benefits and also, it aids their trade activities as stated below by a trader:

“I don’t dispose carton, I could use it to pack a customer’s purchase. Sometimes (..) like now, I sell nails, if I don’t have where to put it for display I tear the carton and use it to put the nails” - BT8.

This practice of re-use and recycling in the marketplace can be associated with the practice of divestment. The practice of divestment is such that divestors makes it a norm to sell, give out, pass down or put into use materials through particular conduits and this results in social relations (Gregson et al., 2007). In essence, this divestment practice leads to social interactions with other actors and forms the basis for social relationships within the market. However, there were likelihoods that this practice could be improved on if the traders have a degree of knowledge of reuse and recycling and its impact on the environment.

\(^{50}\text{Poultry feed}\)
\(^{51}\text{Serves as filling for building foundation}\)
\(^{52}\text{Remnant}\)
Between 5:30 pm and 6:30 pm traders in the old market (South) were seen clearing up and packing their waste. A lot of the traders that sell by the fence pack up their waste with their bare hands and dispose it at the open authorised or unauthorised collection points closest to them. Within this time too, new sets of traders were seen sweeping and setting up their goods for display by the fence and along the road. This trade, although not authorised, lasts until late at night, between 9:00 pm – 10:00 pm. Night markets are typical in Nigeria; they are most often unauthorised operations resulting in social and environmental menace including sale of contraband items, insecurity concerns, noise pollution, vehicular traffic and SWM concerns (Adelaja, 2014; Okafor, 2014). The traders sketchily put together their waste for disposal without much attention to whether or not the areas used for trade were completely cleared up of the waste generated by the night trade. The following morning the traders that own sheds by the fence spend more hours tidying up before setting up their goods for display.

It is observed that the evacuation of waste by the assigned waste handlers was not daily in old market (South) as the traders were faced with the previous days’ waste awaiting collection the next morning. The infrequent evacuation of solid waste forms a part of the problems of SWM practices in markets as the market users continuously heap and dump waste indiscriminately.

In the old market (North), at about 6:00 pm traders were seen leaving the market with a majority of them carrying their waste stored in old plastic bags, cartons, and baskets heading towards the waste placement truck to dispose their waste. When the placement truck is not available for waste collection, the traders dump their refuse on the ground and leave.

The attitudes of the market users give answers to the question raised in Section 7.2 regarding the approaches adopted by the waste handlers concerning waste collection. The traders store their waste in inadequate containers, the majority of them litter and fly dump as they were unable to hold on until evenings to dispose their waste. Because the containers used as storage were inadequate, when the trucks were not available in the evenings for collection, waste is dumped and
exposed to different weather conditions. This poses risk to public health and the environment. This finding is similar to the findings of Kassim and Ali (2006).

7.3.2. Solid Waste Management Practices in Remodelled Markets

There is an enormous difference in the quality of the environment of the old markets from that of the remodelled markets especially in terms of solid waste handling and disposal. The remodelled markets appear cleaner, spacious and were void of indiscriminate dumping of waste.

In the remodelled markets, there were designated areas for waste disposal. The remodelled market (South) has got two built areas designated for waste disposal, a typical built area is shown in Picture 7.3. Whereas the structure of remodelled market (North) is designed in a way that the waste receptacle is attached at the rear of the market building and users of the market were able to dispose their waste at different floor levels as the waste is channeled down via a chute to the designated area. A typical waste disposal area in remodelled market (North) is shown in Picture 7.4.

Picture 7.3: Waste Disposal Area, Remodelled Market (South)
Source: Field notes (2014).
Picture 7.4: Waste Disposal Area, Remodelled Market (North)
Source: Field notes (2014).

Picture 7.3 and 7.4 affirms one of the State Government’s rationales of remodelling markets. It reveals the acknowledgement on the part of the State Government of the need to address SWM concerns in markets as the new markets were serviced with waste disposal areas. However, the images reveal that the provision of infrastructure does not necessarily address the problem as the waste disposal areas were littered and untidy.

The supposed waste collection approach for the remodelled markets is the evacuation of waste from the waste disposal area by 6:00pm daily. However, in remodelled market (South) waste is disposed on the ground between the built area as depicted in Picture 7.5.
When probed about the waste disposal and collection approach, the Chairperson of the market superintendents and the waste handler responsible for the evacuation of waste in the remodelled market (South) both stated that the design of the waste disposal area for the marketplace is not appropriate based on the type of waste generated at marketplaces (mainly organic). They further revealed that the disposal of waste in the built area results in leachate and offensive odour that deters the waste generators from using the facility. The waste handler categorically stated:

“It’s not too appropriate, it has to be restructured. Restructuring I mean, they have to provide a channel for water and all those leakages (leachate) from the waste down to the drain” – DW1.

The extracts confirms the inadequacies in the design of the waste disposal area. Inasmuch as the provision of waste disposal area in the new markets reveals the State Government acknowledges the need to address waste management concerns in markets, the design of markets raises issues of concern as to how much research or stakeholder’s involvement was considered during the design and construction of the remodelled markets. Findings from this study reveal
contradicting statements between the various stakeholders based on perceptions and assumptions regarding their input in the design and construction of marketplaces. As earlier discussed, this has resulted in the production of facilities that were not adequate for marketplaces.

Also, in the remoulded market (North), the chairperson of the traders’ association revealed the practice below:

“The usual practice here is that, by evening time we evacuate them (waste) either with (wheel)barrow, we bring ermmm job men\textsuperscript{53} they evacuate all of them (waste) and send to a point where the RSESA stations their waste truck” – CCMPE3.

When probed further regarding the waste collection method for the remoulded market (North), the chairperson of the traders’ association gave the reason below:

“We have applied to them (RSESA) to come inside here to be collecting it (waste) and they said unless a certain amount is paid which we cannot meet up”.

The above extract again raises concerns in the complexity and unorganised system regarding payments for waste management. On the one hand, the State Government claims to be responsible in terms of payments for waste collection while on the other, the traders were made to pay a fee to the LGC for waste management which is supposedly remitted to the RSESA. There seems to be no checks between these two tiers of Government regarding practices for waste management. However, in their study, Porter et al. (2010) highlighted the massive financial mismanagement and misappropriation by the Local Government in the management of markets.

Also, in the remoulded market (North), a part of the area designated for waste disposal appears to be allocated for storage as depicted in Picture 7.6.

\textsuperscript{53} In this context, labourers
The use of waste disposal area for storage as depicted in Picture 7.6 to an extent questions the knowledge and priority of market managers regarding SWM practices in marketplaces. The traders, on their part, might have no concerns with this because when compared with their old environment this act seems acceptable.

At the start of trade activities (8:00am daily except Thursdays), traders were seen sweeping, dusting and displaying their goods. A few of those who have swept, dispose of their waste immediately at the waste disposal area while a majority of the traders either store their waste in cartons, old plastic buckets and bags, baskets or in (small) heaps on the ground by a corner of their store.

Between the hours of 10:00am and 5:00pm, the market gets busy and the waste volume increases. Traders were seen forcing their waste into their storage while the traders without storage tend to heap and store their waste neatly on the ground by their store. A few times buyers and visitors were heard enquiring from

**Picture 7.6: Waste Disposal Area used for other purposes in Remodelled Market (North)**

Source: Field notes (2014).
traders where they can dispose their waste. Also, occasionally a trader could be
overheard cautioning a buyer/visitor who disposes waste indiscriminately.

The traders’ approach to waste outside the MPE is in common with findings
obtained from traders at the old markets. They stated they have waste storage at
home and dispose waste at an authorised time and location. When probed further
to determine the difference in their waste management practice outside the MPE,
one of the traders emphatically stated:

“It’s different at home because at home you won’t litter but this market is a
busy place, so 12 hours you are either selling or doing something else. If
your customer comes you can’t tell him please let me go and throw this
away, it doesn’t make sense” – BT6.

Again from the extract, timing and the nature of market activities seem to be a
significant factor to be considered for effective waste management practices in
marketplaces. Market traders were mainly involved in small-scale to medium-
scale businesses with a few having slightly larger business concerns and as such
primary objective is on how to make sale to derive profit.

As with the old markets, the traders also carry out the practice of re-use and
recycling in the remodelled markets. The common materials re-used or recycled
were cartons, bottles and plastics. The materials, if not sold to itinerant buyers,
were put into use such as packaging of goods for buyers, storage for goods or
used as waste containers.

Between 5:45pm and 6:00pm, the traders were seen packing up their goods
displayed in front of their store, clearing up waste, and several of the traders were
seen heading to the waste disposal area.

In the remodelled market (North), between the hours of 6:00pm and 6:30pm every
other day, informal waste handlers were seen evacuating the waste with the use
of wheelbarrows and hand push carts to the stationed compactor trucks of the
waste handler designated for the marketplace. Where the waste is not evacuated
at 6:00pm, it is either evacuated between the hours of 6:30am and 7:00am the
following morning or left unattended for a couple of days.
It is observed that the waste generated at the remodelled markets were not evacuated daily.

7.4. The ‘Impact’ of Remodelled Markets on Solid Waste Management Practices in Marketplaces

The remodelling of markets can be said to have had a visible impact on the usage and interactions of the users of the facility especially regarding SWM practices. There is an enormous shift from SWM practices within the old markets and the remodelled markets, this is because the obvious behaviour of littering is reduced to the minimal as it is uncommon to see users of the facility exhibit such behaviour and also the practice of fly dumping is non-existent.

Users of the facility were probed so as to determine if the remodelling of markets has influenced waste management attitude and practices in marketplaces. And also, the nature of its impact on market activities. The users of the market reveal the impact of remodelling markets on SWM practices below:

“In the old market, after sweeping we put it in a waterproof (plastic bag), then we have these people that help dispose the waste. If they don’t come, the front of where we gather the waste (...) maybe fowls have torn the waterproof, we will come back the next day and sweep again. But in this market, we dispose at the area provided, and the market now is clean. Even if the people to evacuate the waste do not come, the area will still be okay” – BT6.

“Well, basically I can say their remodelling of markets is going a long way both in attitude of the traders and also the buyers too. The two parties have attitude to change both in their interactions, the mode of communication and also attitude of dumping of waste. As it is today, the model the State Government has put in place is that if you go round this place now, you will see that there’s a kind of ermmm dish (chute). Right from the people from the second floor, there’s where they throw every of their waste it goes down to the dish (chute). When evacuators come they go to that very pit (receptacle) and ermmm collect the waste that have been dumped for the whole day. And for that reason as the traders are doing it they transfer the
same thing to customers. Even a customer can come now and want to throw waste anyhow, they will say no no no don’t do so, instead they have by their side a waste carton or bin. So the remodelling has gone a long way in sensitising, if you look at the market now you can walk round everywhere without any hitch or whatever to be compared with those days when you want to enter market you must wear rain boot” – CCMPE3

“Vehicles can easily drive into the market, so the remodelling of markets makes it easier for waste to be now reached. (Be)cause, if we don’t have access into the market, you now see that people will not be able to (..) even the wheelbarrows there won’t be able to transfer the waste from where it was generated to where we can have access to. So remodelling has really had significant impact” – DW1.

The key factors here are vehicular accessibility to waste generated and availability of waste disposal areas. For the stakeholders, the presence of facilities (such as waste disposal area, accessibility, especially to waste generated within the marketplaces) that support SWM practices has a significant impact on SWM practices and the cleanliness of marketplaces. The findings supports the studies of Nkwocha et al. (2011) and Regassa et al. (2011), that vehicular accessibility and the provision of waste disposal infrastructure are factors that would enhance waste management practices.

However, inasmuch as the provision of these support facilities has aided SWM practices in terms of disposal, the handling and storage of waste by traders is still inappropriate (as discussed in Section 7.3.2). The remodelling of market structures creates an identity (for new markets) which is valued by the market users, such that the users of the remodelled markets have attached ideas in a particular perception to the use of space thereby stereotyping the old markets as the ‘other’.

The phenomenon of the ‘other’ in social construction and use of space creates an in-group and out-group identity, where the out-group is susceptible to discrimination and stereotyping (Staszak, 2009). Thus, in the use of space in the remodelled markets, the attitudes of the users as regards waste is characterised
by the ‘threat of the other’. The actions of the users of the remodelled markets regarding SWM practices is based on the fact that they do not want their environment to become like the ‘other’ – old markets. The identity created as a result of the new structure has re-enacted self-knowledge of the environment. There is a new custom as to the users’ perception regarding waste in the use of the remodelled markets.

The new markets to an extent have also influenced the users’ perception in terms of how they use and view the marketplace. The users of the market reveal the impact the remodelling of markets has had on their personal and environmental attitudes towards waste in the MPE as related below:

“We are now conscious of the way we dispose waste. We are now conscious of ourselves like yes this is the place to dispose waste” – ABV11.

“When you go to new market you don’t dress as if you are going to a dirty place. You know that you are going to your own office. Even as you are walking anywhere your body touches you are so confident of yourself that it’s a clean place” – BT2.

“Like the kind of market we had, it will be difficult even if you had a good environmental attitude. The market is always messy, the ground is mud you know, water everywhere, when rain falls, it falls in your shed, you have to use bucket. So even if you have a good environmental attitude you will still find yourself that the whole place is somehow. So the remodelling of the market is a major factor” – CCMS4.

The extracts reveal that the actions of individuals within the built environment is influenced by the environment. The extracts of these stakeholders support Vischer (2008) user-centred theory of the built environment. Vischer (2008) posits that the absence of adequate support within a facility could invariably result in harmful environmental situations. The findings of this study supports the viewpoint of Vischer (2008) as the provision of the essential physical infrastructure in markets to an extent has influenced the use of the space especially in terms of SWM practices.
However, an MPE Regulator has a reservation as to how long the remodelling of markets would have an impact on its users.

“It (the remodelling) has helped. But I tell you, come two years, that place will be another different place. Because I learnt they have started giving another phase of the building. You know the government might do something good but people who are managing it because of money, you will see them allocating apart from the way it is structured, you will see them now selling the space and they will give the market another face” – CCMPE2.

The concerns emphasised by the Chairperson of the traders’ association (old market) is primarily based on the management of space and the physical property. The chairperson claims, the market managers in the remodelled markets were letting out common areas to be used as stores by the traders. The above extract questions the management style of the market leadership as to their understanding of property and space management. The implication of their action in the future would result in markets being congested thereby putting pressure on the existing market facilities which would invariably bring markets to the current status of old markets. There is therefore a need to ensure market managers have the required expertise in property and space management.

7.5. Challenges of Solid Waste Management in Marketplaces

The market regulators and waste handlers were probed so as to determine the major challenges faced in achieving effective SWM practices in the MPE.

For the old markets, the market regulators responded as follows;

“One challenge is timing. The waste handlers do not come in time. Also, the traders do not keep their waste at the designated place” – CMC1.

“The challenges is that, sometimes my traders are very very stubborn. If they see the evacuators coming, for them to shift their goods they will be on top of the road (..) even dragging with the people (the waste handlers)” – CCMPE2.
“There are a lot of challenges. One; flood. There is no proper drainage in this market. That is a major challenge. And some of the waste that comes from the road, like during rainy season enters the market and such always generate more waste” – CCMS5

For the remodelled markets, the market regulators recounted the challenges in the extract below;

“The major challenge we are having is that we have applied directly to the sole administrator of RSESA to always send his compactor, his men, to come themselves and pick the refuse from the refuse dump that we have in the market but he said if that should be done, that we should pay him” – CCMPE3.

“Just compliance, I think compliance is the major challenge because it’s very difficult to make them agree with you that this is important. They have been so used to a messy environment so it’s difficult to make them understand” – CCMS4.

The key issues drawn from the extracts are; the timing of waste collection, indiscriminate dumping by traders, compliance and lack of concern by traders regarding SWM, disorganised waste collection systems, lack of (appropriate) drainage within and outside the MPE.

The extract reveals that waste collection times is a major challenge to effective SWM practices in marketplaces. The extract reveals timing in two contexts; the waste handlers not coming at the scheduled time and also at the appropriate time. Scheduled time here refers to the time assigned for waste collection in marketplaces which is between 6:00pm – 7:00pm while appropriate time questions the right time to collect waste from markets. Observations of marketplace activities reveal that, traders were seldom idle throughout the day especially in the old markets. Even when they were chatting or having heated conversations with fellow traders or chatting with their visitors, their hands were not idle as they could be seen either peeling off the husk of their goods, sieving their goods, washing their goods or putting a perfect touch to their goods on display. It thus seem inconveniencing for them to attend to any other duty not
related to trade. Thus, contrary to the thoughts of the MPE regulators and the tag on the attitudes of the traders being stubborn or non-compliant, there is a need to understand the settings and operations of MPE in order to determine appropriate SWM solutions.

However, the attitude of the traders towards waste raises concerns as to their knowledge and lack of awareness of SWM practices. This is because the display of goods is of high importance to the traders whereas this is not the case with the handling of waste. Traders were more concerned on how to attract customers with their style of display. An interesting finding by Omole (2012) on the factors that determine market patronage ranked the neatness of market sixth out of nine factors while the availability of a variety of goods was ranked second. Findings of this study then implies shoppers were less concerned by the market environment.

On the part of the waste handlers, the major challenges encountered in the management of solid waste in MPE is that of compliance and insecurity as related in the extracts below;

“You know we go in the night to evacuate this waste, so we face a whole lot of challenges from all these gangsters. So it poses a lot of threat on us even, armed robbers. Even the police at times, you see sometimes they now look at us as if we connive with all these people to pose security threat to the environment. So when we now evacuate the waste, police will now be suspicious of the content of the waste. Sometimes we want to dump this waste by 2:00am, after police investigation and check, we will now dump it around 4:00am or 5:00am, so it’s affecting our services” – DW1

“One of our major challenges is that in the night, that’s towards the back of prison, most times it’s difficult to work there because of some security issues. In fact, majorly we don’t like working there in the night and we’ve been trying to see how we can talk to the community leaders over there so that they can help us, if (..) even if we are coming to work there in the night some of them will be around, so that once we are through we can leave safely” – DW2
“We evacuate waste in the night, and then you discover that Nigerian market is such a way that, they come in the morning they want to sweep and go and pack the refuse at the place where we have already evacuated the refuse” – DW3

The culture of fear around marketplaces at night – as criminal spaces - seem to have an impact on waste management services. Based on the security concerns associated with the market space at night, the waste handlers were subject to police inspections which results in the loss of time. Also, the extract above regarding compliance of traders reveals that the waste handler in his statement “Nigerian market is such a way that, they come in the morning they want to sweep” seem to have an insight to the nature of marketplaces with particular reference to SWM practices. However, the waste handlers have not considered the nature and custom of marketplaces in developing waste collection strategies for marketplaces suitable for the MPE. It reveals the use of top-down approach in the management of solid waste in marketplaces and this findings supports the study by Abila and Kantola (2013), that ineffective communication and lack of stakeholders involvement are major barriers to effective waste management practices in Nigeria.

The extract indicates the waste handlers would rather the traders change their customs to suit the waste collection strategy for the marketplace but on their part have not communicated to the traders. The lack of communication and stakeholder’s involvement raises concerns as to the implication of developing strategies that will enable the functioning of the marketplace and support marketplace activities. It also implies that, in terms of SWM, the marketplace does not have the appropriate support environment to enable its functioning.

When probed further regarding waste collection times in the evening, one of the waste handlers responded:

“We collect waste especially in the evening because we believe most of the waste comes out in the evening. And also, so that people come in the morning to see a clean environment” – DW2
Again, the key issue here is the use of discretionary power and the lack of consideration of market custom. The waste handlers consider their actions as appropriate for the market environment but fail to consult with the end users before arriving at a decision.

7.6. Factors that Could Enhance Solid Waste Management Practices of Market Users

In order to adequately address SWM concerns in marketplaces, the various stakeholders were probed on the factors that could enhance SWM practices in marketplaces. The emerging themes resulting from the interviews with the market stakeholders were collated. Based on their responses, a total of 10 factors were established and emphasised. These factors are discussed below in no particular order and further justified with data from observations undertaken for the study.

1. **Provision of appropriate market infrastructure:** In terms of infrastructure, the stakeholders were of the opinion that the provision of closed drainage as opposed to open drains, bins both personal (within stores) and for public use with the public bins placed at strategic corners of the market, and the remodelling of the old markets were important factors that would enhance SWM practices in marketplaces. The buyers/visitors and traders held more views regarding the provision of bins within stores and at strategic locations within the marketplace for public use. Below are some of the extracts:

   “In the marketplace I keep insisting, if every shop have a waste bin that is covered and they are using it properly. So that even if these people don’t come every day whenever they come you are able to just lift it and go and dispose. Then even if there should be a special point (collection point), they should have a receptacle or something that can enable them, so immediately they come they just pick it, not just dumping things directly to the floor” – ABV7.

   “The drainage system is also a part that needs to be improved on. Most of the buyers and the sellers, during rainy period instead of them to send their waste that is bagged into the appropriate receptacle, they prefer putting it in the drainage because it’s very close to them” – DW1.
“As they remodelled, that place (old markets) should also be remodelled” – BT4.

“…We need to improve in personal bins in every shop” - CSA6

The extracts reveal the significance of traders having ‘effective’ waste storage containers within their store. Effective in this context, refers to the use of appropriate waste storage containers (preferably storage with lid) and putting the containers to appropriate use. Observations reveal that the traders use old plastic buckets, baskets, plastic bags, cartons as waste storage containers and these containers do not have lids. Also, there are no receptables at the designated collection points in the markets. Waste is dumped and exposed to different weather conditions until it is evacuated by the waste handlers.

Also, observations and interviews reveal that the remodelling of markets has an impact in the handling of waste within the remodelled markets, thus the stakeholders were of the opinion that it is a significant factor to addressing SWM concerns in marketplaces. This is because, apart from the impact of the remodelling on individual environmental attitude, the remodelled markets have adequate facilities such as designated waste disposal areas and closed drains that addresses some of the SWM concerns in marketplaces.

2. Sensitisation and reorientation of market users regarding waste: The importance of sensitisation is stressed below:

“I think people should know the implication of dumping waste” – ABV5

“Ermm what I think, to improve waste management at the marketplace is enlightening the market (..) the buyers and sellers concerning waste… (Traders) associations should also help in sensitising the people concerning waste management” – ABV6.

“We need reorientation of our people” – ABV3.

“Just that ermmm they still need to do more in educating people about how to manage waste” – DW2
This indicates that there is a perception that most market users are not fully aware and knowledgeable of their actions in terms of the handling of waste. The high risk to public health and environmental problems were concerns established by World Bank (2009a) associated with poorly handled waste in marketplaces. Findings from studies by Ezeah and Roberts (2012) and Abila and Kantola (2013) also reveals that the lack of awareness of waste management practices is one of the factors responsible for poor waste management practices.

A buyer/visitor describes the attitude of the traders towards waste in the extract below:

“(Sighs) for me, I will say that their (the traders) attitude towards waste is very poor because when they eat, even the things they sell maybe the husks from it they leave it there. But the funny thing is that’s where they stay. It’s not like they will leave it there and go to a different place. They come the next day they still see it, they don’t touch it, they don’t sweep it, they don’t take it to anywhere for proper disposal they still sit down there with their waste. It’s very wrong and just enlightenment that may change the situation” – ABV6.

Inasmuch as most of the stakeholders interviewed seem to have an idea of the implication of poor waste management practices, there seems to be a large population of market users especially the traders that lack knowledge regarding the implication of poor waste management practices. This is thus a significant factor according to some of the stakeholders that would address waste management concerns in marketplaces.

3. Improved frequency in collection times: Based on observation and extracts already discussed, the frequency in collection of waste seems to be a significant factor in achieving a clean environment in markets. It was observed that the evacuation of waste from the markets was not daily and this forms a part of the SWM problems in markets.

Below are interview extracts on the subject:

“We need to improve in collection timing” – CSA6
“They should be more effective. Like if they carry the dirt, they should make it two times, morning and evening” - CCMPE2

“I think if the government can make it a culture maybe morning and evening, I think it will help. If people keep throwing things at a particular place and each time they come that place looks clean, people will remember that it’s no longer really that way, but there are some spots in the market that every time of the day there’s always dirt there, so people look at that as the dustbin instead of having a bin to be keeping theirs so they just go throw things there and just walk away” – ABV7

The extracts above reveals the importance of improving waste collection times. For the buyers/visitors and an MPE association chairperson, frequency in terms of collection of waste at marketplaces entails collecting waste in the mornings and evenings.

4. Collection of waste at appropriate times: The representative of the RSESA in his statement “we need to improve in collection timing” acknowledges the importance of collection timing in marketplaces but the statement does not reflect an understanding of the appropriate times to evacuate waste at marketplaces. Based on observations undertaken for this study, collection of waste at the appropriate time refers not just to the daily evacuation of waste in the evenings as is supposedly agreed between the Government and the waste handlers or the frequency in waste collection. But collection of waste at appropriate times questions what time is best to evacuate waste from markets.

From earlier discussions based on observation of marketplaces, it has been established that the nature of marketplaces is such that the majority of the traders prefer to sweep, tidy up and dispose waste in the mornings before displaying their goods. A trader offers an explanation of a typical practice regarding waste:

“ Sometimes we might be too lazy to gather the waste, we will keep it until evening and sometimes we forget it and go home. It’s the next day, some people sweep. That’s how it is” – BT6.
Thus, even if there is improved frequency in collection times, it would not necessarily address the problem. It is important to determine the appropriate time to collect waste and this will require the input of the market stakeholders to ensure its success.

5. Daily Clean up and Market Sanitation: The view of daily clean up and market sanitation is held mainly by the traders. The traders were of the opinion if every trader cleans up in the morning before displaying their goods and also carry out the weekly market sanitation it would aid SWM practices.

“Everybody is supposed to clean their shop and their frontage before displaying their goods” – BT9

“What people will do to make markets clean is to keep the environment like all this type of clean up and the rest of them. Then Thursday’s we join other people to do clean up. Then, when you come here, before you display your goods, you keep the environment clean” – BT8

The extract above reveals expectations of everyday market life. It also, to an extent, reveals the market custom of cleaning up and disposing waste in the morning as observed in the cases. The issue of market sanitation is already being addressed as this exercise is carried out on a weekly basis; every Thursday, 8:00am – 10:00am. Some of the traders were of the view that this exercise has enhanced SWM practices in terms of temporarily providing clean markets.

6. Monitoring and Supervision: This is a view held by the buyers/visitors. They were of the opinion that monitoring and supervising SWM practices in marketplaces such as ensuring every store has an ‘effective’ waste bin and supervising the disposal of waste so as to discourage fly dumping would enhance SWM practices in marketplaces. The context of ‘effective’ has been discussed earlier to mean a bin that is appropriate for the waste generated and has a lid so waste is not exposed.

Below are some of the extracts:

“They have people in the marketplace that are (..) the chairperson, those people too should also be very effective too to cross check and see if those...
baskets are available in every store. At least that will help a little bit in managing the waste” – ABV2.

“They (market regulators) should always be checking. There is need for proper supervision” – ABV4.

Observation of the cases for this study revealed that adequate monitoring and supervision of waste management practices in the marketplace is lacking. This is evident in the overall environment of the markets especially the old markets. Also, the traders disposing waste in the morning as opposed to evenings, and indiscriminate dumping of waste within the marketplace by the market users and informal waste handlers reveals there are no proper checks and supervision of waste management practices.

7. Imposition of Fines: Again this is a view held mainly by buyers/visitors. On the subject of fines, the buyers/visitors believe if there is a monetary penalty attached to littering and indiscriminate dumping, it could enhance SWM practices in marketplaces. A buyer/visitor explains

“Sometimes you know when they say if you do this you pay a fine that’s when people sit up”- ABV4.

“I'm thinking that if there was a fine attached to people dropping waste, it will regulate it...You would be really embarrassed to go to such an area where we have people who are not so learned and then they are telling you to pay a fine for dropping something on the floor – ABV5.

The extracts above relates the effect of initiating a fine system for indiscriminate dumping in marketplaces. However, in marketplaces, there already exist penalties for indiscriminate dumping as earlier discussed (see Section 7.2). This thus raises questions as to the effectiveness of the monitoring and supervision of SWM practices by market regulators in marketplaces.

8. Employment of Market Cleaners: The traders hold a view that there is a need to employ the services of cleaners to clean the marketplace on a daily basis as this would aid SWM practices in marketplaces. Below are the extracts:
“Uhmmmm I think they should employ people to clean the way they clean streets, to clean the market every day and pay them” – BT2.

“But if they (management) can bring up that thing (market cleaners) again, it will also create an avenue for people to be employed. And also help in keeping the market clean and also reduce the stress on the traders that are sweeping” – BT7.

Observations undertaken for this study revealed that the traders are responsible for the clean-up of the market. On daily basis, they clean and tidy around their stores before staging their goods. As further observed and confirmed in the course of undertaking the interviews for this study, they also carry out weekly market sanitation as mandated by the State Government (see Section 7.2).

The view of the traders regarding employing market cleaners might be interconnected to the amount paid by the traders as sanitation fee. This is described in the extract below:

“For now we normally pay sanitation fee, when we pay sanitation fee it’s their (the market regulator) own duty to clean up the market” – BT1.

The key issue here is the expectations of the traders based on the fee paid for sanitation. Based on the extract above, the lackadaisical attitude of the traders towards waste could be attributed to a tacit understanding on the part of the traders regarding responsibilities as a result of the sum paid for sanitation purposes.

9. Provision of Signage: Putting up of signs for directions is another view held by the buyers/visitors. The importance of this is emphasised by a buyer/visitor;

“You can’t go to the market for the very first time and know that there is a bin being placed somewhere where you could throw waste except you have a direction towards that” – ABV10.

“Putting of signs to show like this is the place they throw waste” – ABV11.

It was observed that there were no signage in markets that gives direction to waste collection points or warnings as to the impact of indiscriminate dumping of
waste. The extract above thus suggests that the lack of signage for directions could be a significant factor if addressed could enhance the SWM practices of the market users.

10. Provision of Waste Management Office (Waste Experts) within Marketplaces: This view is held by a market regulator.

“They should have a waste management office in the market because some things we see as waste are not waste” – CCMS1

Just as there are offices for market superintendents where information and disputes regarding everyday market life are obtained and resolved respectively, the extract above reveals the need for same regarding waste management. The extract “some things we see as waste are not waste” to an extent reveals an awareness of reuse and recycling. It also reveals the need for personnel with waste management expertise within marketplaces. This might suggest the market regulators do not necessarily have the expertise to deal with the current waste management concerns.

When probed further on their knowledge of SWM practices, or if they receive trainings on same, the market regulators reveal they do not have knowledge on the subject and they rarely receive training on the subject or on the job. Below are typical extracts:

“I do not have much idea but I think once I have attended a seminar which was on the importance of recycling waste” – CCMS1

“No, I don’t (have knowledge)” - CCMS4

The extracts above reveal the market managers do not have adequate knowledge of SWM practices and thus reveals a problem in addressing SWM concerns in marketplaces.
7.7. Reservations Regarding Appropriate Solid Waste Management Practices in Marketplaces

A few stakeholders shared their reservations regarding achieving effective SWM practices in marketplaces.

The stakeholders relate their reservations in the extract below:

“To me nothing can be done to make markets clean. We can do our best and the market will be a little bit clean but it can’t be as clean as we want it. Because in this market, it’s not only the sellers that generate waste. For example there’s one mallam\(^{54}\), when people pay him to collect their waste, he will carry the waste from outside and put in the market because he knows the market is a dirty place” - BT3.

“There are areas that some of the people that do sell in the market are from. This ghetto part of Nigeria that they don’t even see waste as waste, they see it as a normal thing. Normal in the sense that everybody is doing it, so I will do it. So those people since that is their own life style I don’t think they will be able to have any change in the market” – ABV9.

The key concerns here were the issues of accessibility to market collection points and lack of awareness. Observations during fieldwork and extracts from other traders confirm that informal waste handlers within the market vicinity dispose waste in the old market (South) as related below:

“People live around where the market is situated, so when they see that the market has a special place to dispose waste even those neighbours dispose waste there” - BT2.

It can be argued that this on-going practice is unchecked as a result of a lack of effective monitoring and supervision of waste management practices within the marketplace. The said market is the only market that harbours multiple

\(^{54}\) In the context of the statement: an informal waste handler
unauthorised collection points. This is thus a unique subject associated only with this market within the cases studied.

On issues regarding knowledge of waste management practices raised by the research participants, findings of the study by Ezeah and Roberts (2012) and Abila and Kantola (2013) reveals that the lack of awareness of waste management practices is a significant barrier to effective waste management practices. The studies further recommends the need for a continuous public education programmes on best practices regarding SWM in order to address awareness concerns.

The need for sensitisation and orientation is a factor raised by the research participants that could enhance SWM practices in marketplaces. It is anticipated that the introduction of continuous education programmes regarding SWM practices would address the concerns of lack of knowledge.

7.8. Discussions

Data sets throughout this chapter has addressed three major themes; SWM practices in marketplaces, the impact of the remodelling of markets on SWM practices and the factors that could enhance SWM practices in marketplaces. The findings of this chapter were presented and discussed in line with literature reviewed for the study.

7.8.1. The Impact of Improved Facilities on Solid Waste Management in Marketplaces

The remodelling of market structures and providing markets with the basic facilities such as waste disposal areas to an extent has improved waste disposal habits in marketplaces. It provides accessibility to the waste generated and enhances the collection process. Data from interviews reveal that the availability of waste disposal areas and vehicular accessibility to waste generated in marketplaces were factors that have improved waste disposal patterns in the remodelled markets. This supports findings of the study by Nkwocha et al. (2011) and Regassa et al. (2011). These studies posit that vehicular accessibility and
the provision of waste disposal infrastructure are factors that could enhance waste management practices.

However, in providing these facilities the Government has not fully considered the nature of waste from marketplaces (organic waste) and have thus provided inadequate facilities. This study reveals that the inadequacies in the design is as a result of inadequate consultation on the part of the Government with market stakeholders. In their study, Guerrero et al. (2013) advocates that adequate consultation with stakeholders is a critical success factor in SWM operations.

7.8.2. Hopeful vs. Hopeless – Change in Values Regarding Solid Waste Management Practices

Although, the containers used in waste storage were the same in both old and remodelled markets, there is a considerable difference in the handling and disposal of waste in the remodelled markets. The remodelling of market structures creates an identity that is valued by the market users. Although not a perfect system, this to an extent has an impact on their waste disposal habits. The norms and thoughts regarding SWM practices were now different in the remodelled markets. According to Hofstede (2001), these changes in values are based on new rationalisation and this defines their actions and thinking towards SWM practices. Schein (2010) also posits that these values are based on underlying assumptions. For the users of the remodelled markets this could be based on the new identity the remodelling of markets creates. Evidence from observations and interviews reveal the market users were more conscious of their waste disposal habits in the use of the remodelled markets and that socio-cultural perceptions of the older markets as unclean feed into the norms and expectations established at the remodelled markets. This tends to have an impact on the attitudes of the market users towards waste as opposed to the users of the old markets. While the users of the remodelled markets were hopeful and aspire to preserve this new values by their actions - they were overheard cautioning one another regarding SWM practices - the users of the old markets maintain their beliefs, as in the statement by a trader in the old market “nothing can be done to make our markets clean”.
7.8.3. The Practice, Knowledge and Expertise of Market Managers Regarding Solid Waste Management

This study questions the priority accorded to SWM practices by market managers as a result of their practices. Findings on the observed markets reveal a lack of appropriate monitoring and supervision of SWM practices. For instance, in the old markets, the turnout by traders for the weekly sanitation exercise is low. Based on the findings of Agwu (2012), effective monitoring and supervision especially of sanitation exercises in Port Harcourt was recommended as one of the factors to addressing SWM challenges.

The allocation of waste disposal area as storage and communal spaces as stores in the remodelled markets reveals inappropriate practice of market managers. Interviews with the market managers reveal that the market managers do not have knowledge of SWM practices neither do they receive training on the job. According to Ezeah and Roberts (2012), the lack of training and placing SWM responsibilities on unskilled staff is a major constraint to effective SWM. The findings also supports findings of Abejegah et al. (2013) and Taiwo and Ajayi (2013), that the management of markets is marred by poorly trained and corrupt officials resulting in the poor management of markets especially with issues to do with market sanitation, market structures, financial management and congestion of markets.

7.8.4. The Presence of Reuse and Recycling in Markets

Data sets from interviews on the surface reveal the practice of re-use and recycling within marketplaces. Materials such as cartons, plastic bags, shells of seafood, remnant from dried seafood, plastic buckets and bottles were the common materials re-used or recycled. This practice can be associated to the practice of divestment as defined by Gregson et al. (2007). Discussions with traders revealed that the traders do not necessarily have knowledge of these elements (re-use and recycling) of waste management or understand the implication of their actions regarding waste management. This practice is rather undertaken based on economic benefits and it aids their trade activities. This findings is in line with Achi et al. (2012) in which 70% of households sort their
waste at source for monetary benefits. However, evidence from data sets reveals, with a degree of knowledge, the practice of re-use and recycling could be improved in marketplaces.

7.8.5. The ‘Time Factor’ – The Nature of Marketplaces and its Effect on Solid Waste Management Practices

Marketplaces operate from sunrise to sunset (Jerome and Ogunkola, 2000) and are busy as a result of the large urban population that relies on the market for the supply of their foodstuff. Data presented in this chapter reveals that marketplace customs in terms of SWM practices as presented in the previous chapter, is not considered by the waste handlers and market managers in determining waste collection times. Whilst the market custom is such that waste is preferably disposed of in the mornings, the waste collection times for markets were in the evenings. This has an implication on SWM practices in marketplaces as it results in littering and fly dumping.

The key issues here are about the lack of understanding of market custom and operations regarding SWM practices, communication and consultation, implementation problems and the use of discretionary powers. Extracts from interviews with stakeholders reveal convenience and collection times were key issues that have an implication on waste management practices. These factors were also established in studies by Ogwueleka (2009), Regassa et al. (2011) and Ayuba et al. (2013) as factors responsible for inefficient waste management. However, this study has redefined collection times for marketplaces to mean there is a need to determine the appropriate time to collect waste in MPEs. This means improving the frequency in collection times will not address SWM concerns in marketplaces as a result of the nature of marketplaces. Determining the appropriate time to collect waste will require inputs of all stakeholders especially the traders and an understanding of market culture.

The traders were not consulted before collection times were arrived at for markets and this presents a classic problem of implementation. According to Olaseha et al. (2005), the top-bottom approach in the management of waste in marketplaces is an approach that most often fails. Also, this approach confirms the supposition
of Palczynski (2009) that the lack of communication and involvement of stakeholders during decision-making and throughout the waste management process is an important element that is lacking in African societies.

Data sets also reveals the application of discretionary powers on the part of the waste handlers and market managers in delivering waste management services. Decisions, especially regarding collection times and collection points, were based solely on the discretion of the waste handlers and the market managers. On the one hand, it can be argued that the waste handlers have the expertise regarding waste management practices thus their decisions were based on effecting ‘good’ waste management practices. However, communication and consultation are important tools that should be utilised. Thus, the reasons for implementation failure based on data sets presented could be attributed to the lack of communication and consultation between stakeholders which is interrelated to the use of discretionary powers by the waste handlers and the market managers.

Based on the preceding findings, this study reveals that the factors that underpin the attitudes of the market users are the lack of understanding of market custom and operations regarding SWM practices, lack of communication and consultation, implementation problems and the use of discretionary powers. This questions the current approach to SWM in MPEs and reveals a need for a change in approach. Taiwo and Ajayi (2013) had earlier found that the key factors that influence waste disposal attitudes of traders as; illiteracy, ignorance, negligence and laziness. However, Taiwo and Ajayi (2013) had focused on the SWM practices of traders alone. This study has however provided an understanding of the practices of a range of market stakeholders in order to determine the factors that underpin the attitudes of the market users.

Having analysed the practices of SWM from the perspective of the different market stakeholders and also revealing that of the surrounding neighbourhood as it constitutes SWM problems in MPEs, this study reveals that attitudinal change lies primarily with the market managers rather than the market users. This is so because the market managers are in a better position to deliver change in terms of overall SWM processes which will include the sensitisation and
reorientation, and supervision and monitoring of SWM activities. However, the market managers must have knowledge of market practices and custom in order to be efficient. The current approach to SWM in marketplaces thus presents a classic answer to the research question as to why we still have markets where waste is a problem.

7.8.6. Enhancing the Facilities Managers Role in Marketplace Solid Waste Management

Determining barriers/factors in order to establish militating factors is a common approach in environmental management to providing solutions to waste management in developing societies. Ezeah and Roberts (2012) analysed the success and barrier factors mitigating the adoption of sustainable SWM in Nigeria. Also, Guerrero et al. (2013) analysed influential factors on waste management process in 30 urban areas in 22 developing countries.

For this study, 10 factors was determined from interviews with marketplace stakeholders as factors that could enhance the SWM practices of the market users. When compared with attitudinal change factors in Table 4.3 (see Chapter 4: Section 4.6), the key related factors were: provision of infrastructure, sensitisation and orientation, monitoring and supervision, and collection times.

Based on the study, the issues of consultation, implementation problems and the use of discretionary power by the waste handlers and market managers was raised as factors that underpin the attitudes of the market users towards waste. These factors are, however, embedded within the 10 factors obtained from interviews with the stakeholders. For instance, typically, the issues of collection of waste at appropriate times and improved frequency in waste collection times cannot be properly addressed without consulting with the stakeholders. This in turn will address implementation problems and the use of discretionary power.

The 10 factors are further integrated in the developed conceptual model of the MPE (Figure 6.7) revealing how they relate to each component of the MPE. This is illustrated in Figure 7.1 below.
Figure 7.1: The Integration of the Factors that would Enhance the SWM Practices of the Market Users in the Developed Conceptual Model of the MPE

Note: The position of the factors within the components was not derived quantitatively.
Factors C, D, F, H, J and K are related to the business support services for the MPE. Findings from qualitative data reveals these factors are currently lacking in the MPE. Factor E relates to both the human component and the business support services. This is because currently, the daily clean up and weekly market sanitation are undertaken by the traders. Data sets reveal that, this is not adequately monitored and supervised especially in the old markets. Thus, the markets remain untidy. Thus, the traders have recognised the need for this support service to be provided – the employment of market cleaners. In this case, the traders will only be responsible for the daily clean up of their stores, while there is a support service responsible for the common areas of the MPE.

Factors B and C are related to the people component. The market superintendents (who are LGC staff) are responsible for the imposition of fines on traders who default on waste management practices (see Section 7.2). While factor A relates solely to the market buildings, facilities and infrastructure. Data sets reveal that, the remodelling of market structure, providing them with adequate infrastructure such as closed drainage are factors that have influence on the SWM practices of the market users.

Figure 7.1 reveals that the factors that would enhance SWM practices of the market users relate more around the business support services for the MPE. This reinforces the importance of FM service within the MPE. It reveals the need for a robust business support services in the MPE in order to address SWM concerns. However, the people component, and buildings, facilities and infrastructure should not be ignored as there are factors that exist within these components that should be given attention.

There is further need to determine the relationship between these factors and the factors that should be prioritised in the management of waste in marketplaces. The essence of determining the relationship between the factors is to provide an understanding of the interdependencies between factors so as to inform the actions of the market facilities managers.
Markets like the ones observed, form a central part of the Nigerian society providing employment, income and servicing the urban population with their everyday needs. However, SWM is a reoccurring challenge in the management of markets. This chapter has thus provided a more in-depth and sophisticated understanding of attitudes towards waste in MPEs. A significant contribution to literature made by this study is that it supplements and enhances existing understanding of attitudes towards waste from a range of different stakeholders.

Through evidence from the empirical fieldwork, the chapter reveals how the MPE and the practices of the MPE regulators influence the SWM practices of the market users. Although not a perfect system, findings reveal a change in the market users’ custom and beliefs regarding SWM practices as a result of the remodelling of markets.

The lack of understanding of market culture and operations regarding SWM practices, lack of communication and consultation, implementation problems and the use of discretionary powers are key factors that underpin the attitudes of the market users. Based on this, I argue that attitudinal change lies primarily with the market managers as they are in a better position to deliver change in terms of overall SWM processes. However, the market managers must have knowledge of market practices and custom in order to be efficient. The identification and evaluation of these factors achieves a part of the aim of this study and also provides answer to the research questions.

This chapter further presents 10 factors that needs to be incorporated in the SWM strategies of MPEs in order to enhance the SWM practices of the market users. It is anticipated that knowledge of these factors will enhance the FM operations and performance of the MPE in terms of SWM. However, there is further need to establish the interrelationship between the factors in order to inform the practices of the market facilities managers.

The next chapter provides an analysis of the 10 factors and establishes the interrelationship of the factors and the factors to be prioritised by the market facilities manager in the management of solid waste.
Chapter 8. Enhancing Solid Waste Management Practices in Marketplaces

8.1. Introduction

The previous chapter provided an in-depth understanding of attitudes towards waste in marketplaces. 10 factors identified from interviews with market stakeholders were established as factors that would enhance SWM practices of the market users. Other studies have also provided factors that impede or enhance waste management practices (Bartone, 1995; Ezeah and Roberts, 2012; Mukui, 2013; Amuda et al., 2014). However, there is a need to provide an understanding of the interrelationship between factors so as to provide a holistic understanding of the factors in order to inform decision-making processes.

Thus, additional data was collated utilising questionnaires and focus group discussion and exercise with market stakeholders. Firstly, data derived from the questionnaires were analysed using the Relative Importance Index (RII) and Severity Index (SI). After which the data derived from the focus group discussion and exercise were analysed utilising the Interpretive Structural Modelling (ISM) methodology. The RII and the SI were utilised to establish the order of importance of the factors and the effect of the factors on the SWM practices of the market users respectively, while the ISM was utilised to determine the contextual relationship between the factors. An ISM influence based model that depicts the interaction and interrelationship between the factors was developed. The findings from the questionnaires and focus group discussions and exercise were discussed side by side in order to triangulate the findings derived from the two approaches.

The developed ISM influence based model could serve as a guide for market facilities managers in overall barrier management of waste in MPEs.

8.2. Results of Questionnaire

As already described in the methodological chapter, the questionnaires were hand delivered as a result of the characteristics of the sample population (see Section 5.9.3). Field notes were also taken in the course of administering the
questionnaires in order to provide further understanding of the perception of the study participant. The field notes have been incorporated in the discussions of the data generation, collation and analysis from the questionnaires.

8.2.1. Relative Importance Index of Factors that could Enhance Solid Waste Management Practices of Market Users

The perception of the various stakeholders within the case studies regarding the factors was obtained via administered questionnaires. However, the perception of the buyers/visitors were analysed separately (not within each case). This is so because of the dynamic movement of buyers/visitors; they cannot be associated with a particular market. The indices for each factor was then adopted in order to determine the overall rank for each factor. This enabled evaluation of data sets as perceived by stakeholders within each case, thus revealing the importance of each factor within each case.

The mean of the indices for the old markets and remodelled markets was derived in order to determine the relative importance of the factors within the old and remodelled markets. Furthermore, in order to reveal the overall importance of the said factors across the case studies and stakeholders' category, the mean of the indices for each factor was determined. This enabled the overall ranking of each factor based on the resulting indices.

Table 8.1 illustrates the RII within the case studies and the overall ranking for both old and remodelled markets while Table 8.2 illustrates RII for all cases including the buyer/visitors and the overall ranking.
Table 8.1: RII of Factors that could Enhance Solid Waste Management Practices in Old and Remodelled Markets

<table>
<thead>
<tr>
<th>Factors</th>
<th>OM (South)</th>
<th>R</th>
<th>OM (North)</th>
<th>R</th>
<th>Mean</th>
<th>Overall Rank</th>
<th>RM (South)</th>
<th>R</th>
<th>RM (North)</th>
<th>R</th>
<th>Mean</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Provision of appropriate market infrastructure</td>
<td>0.950</td>
<td>1</td>
<td>0.925</td>
<td>3</td>
<td>0.938</td>
<td>2</td>
<td>0.906</td>
<td>2</td>
<td>0.901</td>
<td>3</td>
<td>0.904</td>
<td>2</td>
</tr>
<tr>
<td>B. Sensitisation and orientation</td>
<td>0.945</td>
<td>2</td>
<td>0.941</td>
<td>1</td>
<td>0.943</td>
<td>1</td>
<td>0.894</td>
<td>4</td>
<td>0.901</td>
<td>3</td>
<td>0.898</td>
<td>4</td>
</tr>
<tr>
<td>C. Collection of waste at appropriate time(s)</td>
<td>0.935</td>
<td>3</td>
<td>0.920</td>
<td>4</td>
<td>0.928</td>
<td>3</td>
<td>0.891</td>
<td>5</td>
<td>0.899</td>
<td>5</td>
<td>0.895</td>
<td>5</td>
</tr>
<tr>
<td>D. Improved frequency in waste collection</td>
<td>0.930</td>
<td>4</td>
<td>0.798</td>
<td>9</td>
<td>0.864</td>
<td>8</td>
<td>0.869</td>
<td>6</td>
<td>0.895</td>
<td>7</td>
<td>0.882</td>
<td>7</td>
</tr>
<tr>
<td>E. Daily clean up by traders &amp; market sanitation</td>
<td>0.895</td>
<td>5</td>
<td>0.930</td>
<td>2</td>
<td>0.913</td>
<td>4</td>
<td>0.943</td>
<td>1</td>
<td>0.905</td>
<td>1</td>
<td>0.924</td>
<td>1</td>
</tr>
<tr>
<td>F. Monitoring &amp; supervision of waste management practices</td>
<td>0.861</td>
<td>6</td>
<td>0.918</td>
<td>5</td>
<td>0.890</td>
<td>5</td>
<td>0.901</td>
<td>3</td>
<td>0.903</td>
<td>2</td>
<td>0.902</td>
<td>3</td>
</tr>
<tr>
<td>G. Imposition of fines</td>
<td>0.860</td>
<td>7</td>
<td>0.887</td>
<td>7</td>
<td>0.874</td>
<td>6</td>
<td>0.869</td>
<td>6</td>
<td>0.899</td>
<td>5</td>
<td>0.884</td>
<td>6</td>
</tr>
<tr>
<td>H. Employment of market cleaners</td>
<td>0.779</td>
<td>10</td>
<td>0.679</td>
<td>10</td>
<td>0.729</td>
<td>10</td>
<td>0.472</td>
<td>10</td>
<td>0.842</td>
<td>10</td>
<td>0.657</td>
<td>10</td>
</tr>
<tr>
<td>J. Provision of signage</td>
<td>0.857</td>
<td>9</td>
<td>0.889</td>
<td>6</td>
<td>0.873</td>
<td>7</td>
<td>0.805</td>
<td>9</td>
<td>0.891</td>
<td>8</td>
<td>0.848</td>
<td>9</td>
</tr>
<tr>
<td>K. Provision of waste management office (waste experts) within MPEs</td>
<td>0.858</td>
<td>8</td>
<td>0.800</td>
<td>8</td>
<td>0.829</td>
<td>9</td>
<td>0.825</td>
<td>8</td>
<td>0.890</td>
<td>9</td>
<td>0.858</td>
<td>8</td>
</tr>
</tbody>
</table>

Legend:
OM: Old Market.
RM: Remodelled Market.
R: Rank.
Table 8.2: Overall Ranking of RII of Factors that could Enhance Solid Waste Management Practices in MPEs

<table>
<thead>
<tr>
<th>Factors</th>
<th>OM (South)</th>
<th>R</th>
<th>OM (North)</th>
<th>R</th>
<th>RM (South)</th>
<th>R</th>
<th>RM (North)</th>
<th>R</th>
<th>Buyers/Visitors</th>
<th>R</th>
<th>Mean</th>
<th>Overall Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Provision of appropriate market infrastructure</td>
<td>0.950</td>
<td>1</td>
<td>0.925</td>
<td>3</td>
<td>0.906</td>
<td>2</td>
<td>0.901</td>
<td>3</td>
<td>0.976</td>
<td>2</td>
<td>0.932</td>
<td>1</td>
</tr>
<tr>
<td>B. Sensitisation and orientation</td>
<td>0.945</td>
<td>2</td>
<td>0.941</td>
<td>1</td>
<td>0.894</td>
<td>4</td>
<td>0.901</td>
<td>3</td>
<td>0.978</td>
<td>1</td>
<td>0.932</td>
<td>1</td>
</tr>
<tr>
<td>C. Collection of waste at appropriate time(s)</td>
<td>0.935</td>
<td>3</td>
<td>0.920</td>
<td>4</td>
<td>0.891</td>
<td>5</td>
<td>0.899</td>
<td>5</td>
<td>0.953</td>
<td>3</td>
<td>0.920</td>
<td>4</td>
</tr>
<tr>
<td>D. Improved frequency in waste collection</td>
<td>0.930</td>
<td>4</td>
<td>0.798</td>
<td>9</td>
<td>0.869</td>
<td>6</td>
<td>0.895</td>
<td>7</td>
<td>0.948</td>
<td>4</td>
<td>0.888</td>
<td>6</td>
</tr>
<tr>
<td>E. Daily clean up by traders &amp; market sanitation</td>
<td>0.895</td>
<td>5</td>
<td>0.930</td>
<td>2</td>
<td>0.943</td>
<td>1</td>
<td>0.905</td>
<td>1</td>
<td>0.936</td>
<td>5</td>
<td>0.922</td>
<td>3</td>
</tr>
<tr>
<td>F. Monitoring &amp; supervision of waste management practices</td>
<td>0.861</td>
<td>6</td>
<td>0.918</td>
<td>5</td>
<td>0.901</td>
<td>3</td>
<td>0.903</td>
<td>2</td>
<td>0.907</td>
<td>8</td>
<td>0.898</td>
<td>5</td>
</tr>
<tr>
<td>G. Imposition of fines</td>
<td>0.860</td>
<td>7</td>
<td>0.887</td>
<td>7</td>
<td>0.869</td>
<td>6</td>
<td>0.899</td>
<td>5</td>
<td>0.910</td>
<td>7</td>
<td>0.885</td>
<td>7</td>
</tr>
<tr>
<td>H. Employment of market cleaners</td>
<td>0.779</td>
<td>10</td>
<td>0.679</td>
<td>10</td>
<td>0.472</td>
<td>10</td>
<td>0.842</td>
<td>10</td>
<td>0.613</td>
<td>10</td>
<td>0.677</td>
<td>10</td>
</tr>
<tr>
<td>J. Provision of signage</td>
<td>0.857</td>
<td>9</td>
<td>0.889</td>
<td>6</td>
<td>0.805</td>
<td>9</td>
<td>0.891</td>
<td>8</td>
<td>0.916</td>
<td>6</td>
<td>0.872</td>
<td>8</td>
</tr>
<tr>
<td>K. Provision of waste management office (waste experts) within MPEs</td>
<td>0.858</td>
<td>8</td>
<td>0.800</td>
<td>8</td>
<td>0.825</td>
<td>8</td>
<td>0.890</td>
<td>9</td>
<td>0.882</td>
<td>9</td>
<td>0.851</td>
<td>9</td>
</tr>
</tbody>
</table>

Legend:
OM: Old Market.
RM: Remodelled Market
R: Rank
The analysis in Table 8.1 reveals the three most important factors that could enhance SWM in the old markets were:

- (1) Sensitisation and orientation (RII = 0.943)
- (2) Provision of appropriate market infrastructure (RII = 0.938)
- (3) Collection of waste at appropriate time(s) (RII = 0.928)

Whereas the two least important factors were:

- (9) Provision of waste management office (waste experts) within marketplaces (RII = 0.829), and
- (10) Employment of market cleaners (RII = 0.729)

In the remodelled markets, the analysis in Table 8.1 reveals the three most important factors as:

- (1) Daily clean up and market sanitation (RII = 0.924)
- (2) Provision of appropriate market infrastructure (RII = 0.904)
- (3) Monitoring and supervision of waste management practices (RII = 0.902)

Whereas the two least important factors were:

- (9) Provision of signage (RII = 0.848), and
- (10) Employment of market cleaners (RII = 0.657)

The overall analysis in Table 8.2 reveals that the five most important factors that could enhance SWM practices as perceived by the stakeholders were:

- (1) Provision of appropriate market infrastructure (RII = 0.932) and Sensitisation and reorientation (RII = 0.932)
- (3) Daily clean up and market sanitation (R = 0.922)
- (4) Collection of waste at appropriate times (RII = 0.920) and
(5) Monitoring and supervision of waste management practices (RII = 0.898).

Whereas the two least important factors were:

- (9) Provision of waste management office (waste experts) within marketplaces (R = 0.851) and
- (10) Employment of market cleaners (R = 0.677)

While the provision of appropriate market infrastructure and the sensitisation and orientation of market users regarding SWM practices were the most important factors in old market (South) and old market (North) respectively, the daily clean up and market sanitation is perceived as the most important factor by the stakeholders in the remodelled markets. Whereas sensitisation and orientation is perceived as the most important factor by the buyers/visitors.

The perception of the stakeholders in the remodelled markets can be said to be interconnected to the identity that comes with the remodelling of markets as revealed from qualitative data sets. It is an identity valued by the market users which has resulted in the market users adopting new values in terms of SWM practices in relating with the new environment. This finding complements the findings from qualitative data sets on the impact of remodelling markets. The findings suggest that the daily clean-up and market sanitation is perceived by the stakeholders in the remodelled markets as the most important factor so as to maintain that identity resulting from the remodelling of markets.

Data from field notes obtained in the course of administered questionnaires reveals that the employment of market cleaners and the provision of a waste management office within marketplaces is perceived by some stakeholders as factors that would result in financial burden on the part of the traders. The traders were of the opinion that even though these were important factors (particularly the provision of a waste management office within marketplaces), they would be made to pay more sanitation fees in order to cater for the services of market cleaners and waste management experts. The findings raise questions as to the willingness to pay (WTP) for environmental improvement. Kirama and Mayo
(2016) posits that in order to have successful waste management systems, municipal authorities have the responsibility of raising awareness amongst waste generators in order to improve their WTP for refuse fees.

Also, the stakeholders, especially the traders, perceived the employment of market cleaners as a factor that would make the traders become lazy as regards cleaning and tidying up of market space. This suggests that they perceive the employment of market cleaners as a factor that would have a negative effect on the attitudes of the traders towards waste, diluting the common responsibility felt for the environment.

8.2.2. Severity Index (SI) of Factors that could Enhance Solid Waste Management Practices of Market Users

The participants were further requested to rate the effect of the factors that could enhance SWM practices of the market users. The responses were analysed using the SI and presented in Table 8.3 (see details of technique in Section 5.10.3).

Table 8.3: Analysis of the Effect of the Factors that could Enhance Solid Waste Management Practices

<table>
<thead>
<tr>
<th>Factor</th>
<th>SI</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>A - Appropriate market Infrastructure</td>
<td>94.32</td>
<td>1</td>
</tr>
<tr>
<td>B - Sensitisation and orientation</td>
<td>94.29</td>
<td>2</td>
</tr>
<tr>
<td>C - Collection of waste at appropriate time(s)</td>
<td>91.80</td>
<td>3</td>
</tr>
<tr>
<td>D - Improved frequency in collection times</td>
<td>90.56</td>
<td>4</td>
</tr>
<tr>
<td>E - Daily clean up by traders &amp; market sanitation</td>
<td>90.35</td>
<td>5</td>
</tr>
<tr>
<td>G - Imposition of fines</td>
<td>90.00</td>
<td>6</td>
</tr>
<tr>
<td>F - Monitoring and supervision</td>
<td>89.08</td>
<td>7</td>
</tr>
<tr>
<td>J - Use of signage</td>
<td>87.83</td>
<td>8</td>
</tr>
<tr>
<td>K - Provision of waste management experts</td>
<td>87.15</td>
<td>9</td>
</tr>
<tr>
<td>H - Employment of market cleaners</td>
<td>73.38</td>
<td>10</td>
</tr>
</tbody>
</table>

Based on the interpretations stated in Section 5.10.3, the first eight factors are considered as ‘extremely important’ while the ninth and tenth factors are ‘very effective’ in enhancing SWM practices in MPEs.
When compared with data in Table 8.2, it then means although the provision of waste management office within marketplaces and the employment of market cleaners is ranked least, these factors would still have a positive effect on the SWM practices of the market users.

8.3. Results of Focus Group: Contextual Relationship of Factors that could Enhance Solid Waste Management Practices of the Market Users

The use of focus group discussions and exercise for this study was to have clarity in the context of the factors that could enhance SWM practices determined from data sets from interviews. Also, the technique was adopted in order to provide a deeper understanding and determine the contextual relationship between the factors.

In determining the interrelationship between the factors, the ISM technique was adopted (see details in Chapter 5: Section 5.10.4). Focus group discussions and exercise was utilised as the idea generation tool in the application of the ISM technique. The ISM steps laid out in Figure 5.2 (see Chapter 5: Section 5.10.4) was followed in arriving at the influenced based model depicting the interactions and interdependencies between the factors being considered. The steps are discussed as follows:

1. Presentation and discussion of factors: The factors under consideration in this study were identified via semi-structured interviews with the various MPE stakeholders. The factors were further presented and discussed during the focus group session. The essence of this was to confirm if there were other factors not being considered and to have clarity of the context in which the factors were being considered. The factors were confirmed and are listed below;

   - A. Provision of appropriate market infrastructure
   - B. Sensitisation and orientation
   - C. Collection of waste at appropriate time(s)
   - D. Improved frequency in collection times
E. Daily clean-up and market sanitation

F. Monitoring and supervision of waste management practices

G. Imposition of fines

H. Employment of market cleaners

J. Provision of signage

K. Provision of waste management office (waste experts) within MPEs

2. Establish contextual pairwise relationship and develop Structural Self-Interaction Matrix (SSIM): The SSIM is the outcome of the contextual pairwise relationship. The SSIM is a matrix depicting the type of direction of the relationship between the factors being studied.

The use of expert group opinion through focus group as suggested by the ISM methodology was utilised for this phase. The ISM methodology provides that expert group could be made up of those in the industry, academia or persons conversant and well versed with the problem under consideration (Ravi and Shankar, 2005; Attri et al., 2013; Poduval et al., 2015). Also, the Ketso approach to community facilitation and focus group was adapted to enhance the focus group session of this study (see details in Section 5.9.4).

As earlier stated, a focus group made of 10 market stakeholders (see Table 5.5) was utilised in developing the contextual relationship among the factors being studied. A contextual relationship of ‘influences’ type – one factor influences another (Attri et al., 2013) - was chosen in order to establish if contextual relationship exists between pairs of factors.

To determine the contextual relationship, the process was divided into two phases. At the first phase the participants were divided into two groups. Each group was presented with five of the factors written out on rectangular shaped sheets: one group had the first five factors while the other group was presented with the remaining five factors. The essence of dividing the participants into two groups was to facilitate the process and enable better commitment and
engagement of participants. Also, it was important to enable discussion and comparison of the outcome between groups before arriving at a common ground.

The participants were provided with stationery – pencils and erasers - and the groups were then presented with five different colours of sticky post. The colours represented the scale 1 – 5 (1 – Very Low, 2 – Low, 3 – No Effect, 4 – High, 5 – Very High) for rating the influence of pairs of factors. The colour representation was as follows; Pink – Very Low, Blue – Low, Peach – No Effect, Lemon Green – High and Orange – Very High. The participants were to attach nine sticky post to each factor being considered. Each colour represented the rate of influence. Images from the focus group session illustrating the activity is shown in Picture 8.1 and 8.2.

**Picture 8.1:** Participants at the start of the Focus Group Discussion and Exercise Source: Field notes (2015).
Picture 8.2: Colours on Rectangular Shaped Sheets Illustrating the Level of Influence between Factors

Picture 8.1 and 8.2 shows images of participants addressing five factors (rectangular shaped sheets) each at a time. As earlier stated, the various colours on the rectangular shaped sheet represent the level of influence between factors. The process in deriving and evaluating the influence between factors was thought-provoking with interesting debates between the participants. There were instances when the participants had to refer back to a particular factor to make changes to initial valuation. Typical valuation process in determining the influence between some of the factors is highlighted below:

Valuation process between factor A – Provision of appropriate market infrastructure and C – Collection of waste at appropriate time(s);

**CCMS3**: “If there’s appropriate market infrastructure, yes na\(^{55}\). Because once the facilities are there and the people (waste handlers) are there, they will do it”.

---

\(^{55}\) Pidgin word used to stress emphasis

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BT1: “Chairman, wait o⁵⁶, let’s have a look at this thing (the factors being considered) well (properly). That word appropriate time means there’s no influence o”.

ABV2: “Hold on o, I think the provision of market infrastructure will not influence the collection of waste at appropriate time. Because we are looking at the word appropriate time here. Infrastructure does not influence collection of waste at appropriate time but can influence collection of waste”.

DW1: “Yes, because appropriate time is for us to know the best time we can evacuate waste from the market”.

CCMS3: “I see, I was looking at the ease of collection because of the facilities in place”.

CCMPE2: “So we are going with no effect then”.

Valuation process between factor H – Employment of market cleaners and J – Provision of signage;

DW2: “Provision of signage is very important”.

ABV1: “Remember we are looking at if the employment of market users will influence the use of signage and not the other way round”.

BT2: “How can that influence? I don’t think it will influence it”.

CSA1: “Employment of market cleaners is unnecessary unless Government will pay. But I know (traders’) Union will be unwilling”.

CCMPE1: “It’s not necessary. Let us continue to clean ourselves, it’s better”.

ABV1: “Anyway, the employment of market cleaners does not influence the provision of signage”.

⁵⁶ Pidgin word used to stress emphasis
An interesting observation was that the debates were not dominated by the market regulators. The participants listened to each other’s thought before arriving at a conclusion. This reveals the benefit of focus group technique; as it enables discussions that lead to a common understanding around complex issues.

After the groups were finished with the first five factors, the groups were made to exchange positions in order to address the factors already addressed by the other group. The groups were asked to place a different colour (of sticky post) on factors that they had a different opinion on as regards the rate of influence. Images of the outcome of this exercise is shown in Picture 8.3 and 8.4.

Picture 8.3: Participants Addressing Factors already considered by the other Group
The rectangular shaped sheets in Picture 8.3 and 8.4 shows some of the factors the groups have a different opinion on as regards their level of influence. These factors have got two different colours attached indicating different opinions on the level of influence. For example, one group labelled the influence of factor H - employment of market cleaners on factor B - sensitisation and orientation as high (lemon green colour) while the other thinks there’s no effect (Peach colour).

At the end of this phase, the second phase kicked off. The groups were brought together in order to discuss and arrive at a consensus. At this phase, some of the initial ratings given by the groups was changed entirely to a different rating. The outcome of this phase is presented in Table 8.4.
Table 8.4: Final Ranking of Factors that could Influence Solid Waste Management Practices by the Focus Group Participants

<table>
<thead>
<tr>
<th>Factors</th>
<th>A. Provision of appropriate market infrastructure</th>
<th>B. Sensitisation &amp; orientation</th>
<th>C. Collection of waste at appropriate time(s)</th>
<th>D. Improved frequency in collection times</th>
<th>E. Daily clean-up by traders and market sanitation</th>
<th>F. Monitoring &amp; supervision</th>
<th>G. Imposition of fines</th>
<th>H. Employment of market cleaners</th>
<th>J. Provision of signage</th>
<th>K. Provision of waste management experts</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Provision of appropriate market infrastructure</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>B. Sensitisation &amp; orientation</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>C. Collection of waste at appropriate time(s)</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>D. Improved frequency in collection times</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>E. Daily clean-up &amp; market sanitation</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>F. Monitoring &amp; supervision of waste management practices</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
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<td>3</td>
</tr>
<tr>
<td>G. Imposition of fines</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>H. Employment of market cleaners</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
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<td>4</td>
<td>4</td>
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</tr>
<tr>
<td>K. Provision of waste management experts</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
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</tr>
</tbody>
</table>
Data sets in Table 8.4 illustrates the influences between pairs of factors as determined by the focus group participants. For instance, factors A – J has no effect (in terms of influence) on factor K whereas factor K has an influence ranging from high and very high on all other factors.

The outcome of this phase led to the creation of the Structural Self-Interaction Matrix (SSIM). The participants were requested to determine a directional (one way, both ways or no relationship) contextual pairwise relationship between the factors based on the outcome of Table 8.4. The directional contextual pairwise relationship between the factors is shown diagrammatically in Table 8.5. As earlier stated the ‘influence’ type of relationship was chosen and the direction of the relationship between two factors (say i and j) were questioned. The SSIM for this study is shown in Table 8.5.

The following symbols utilised by Poduval et al. (2015) was applied to define the relationship:

- **F**: forward relationship from i to j i.e i influences j,

- **R**: reverse relationship from j to i i.e j influences i,

- **FR**: dual directional relationship i.e i and j influences each other,

- **X**: no relationship exists between i and j.
Table 8.5: Structural Self-Interaction Matrix (SSIM)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Provision of appropriate market infrastructure</td>
<td>R</td>
<td>FR</td>
<td>X</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td>X</td>
<td>F</td>
</tr>
<tr>
<td>B. Sensitisation &amp; orientation</td>
<td>R</td>
<td>R</td>
<td>X</td>
<td>FR</td>
<td>FR</td>
<td>FR</td>
<td>FR</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>C. Collection of waste at appropriate time(s)</td>
<td>R</td>
<td>X</td>
<td>X</td>
<td>F</td>
<td>FR</td>
<td>R</td>
<td>F</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>D. Improved frequency in collection times</td>
<td>R</td>
<td>X</td>
<td>X</td>
<td>F</td>
<td>R</td>
<td>F</td>
<td>R</td>
<td>R</td>
<td>FR</td>
</tr>
<tr>
<td>E. Daily clean-up &amp; market sanitation</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>FR</td>
<td>R</td>
<td>F</td>
<td>R</td>
<td>R</td>
<td>FR</td>
</tr>
<tr>
<td>F. Monitoring &amp; supervision of waste management practices</td>
<td>R</td>
<td>FR</td>
<td>X</td>
<td>F</td>
<td>R</td>
<td>F</td>
<td>R</td>
<td>R</td>
<td>FR</td>
</tr>
<tr>
<td>G. Imposition of fines</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
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</tr>
<tr>
<td>H. Employment of market cleaners</td>
<td>R</td>
<td>X</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>J. Provision of signage</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>K. Provision of waste management experts</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
</tr>
</tbody>
</table>
From Table 8.5, based on the symbols applied to define the relationships, for instance the entry between factor A and B is ‘F’. This means, the provision of appropriate market infrastructure will have an influence on sensitisation and orientation of market users. This is already reflected from qualitative data sets, as users of the remodelled markets tend to be conscious of their waste disposal habits. The entry ‘R’ for factor A and K means, the provision of waste management experts within MPEs will enhance the provision of appropriate market infrastructure. Also, the entry ‘FR’ for factor B and G indicates both factors influence one another. It means sensitisation and orientation of market users influences the imposition of fines. This will serve as a deterrent to market users of the consequences of their actions. Also, the imposition of fines serves as some form of sensitisation as the market users were constantly reminded through the avenue of the consequences of poor waste attitudes. Factors C and J are unrelated and is denoted by the entry ‘X’. This means the collection of waste at appropriate time(s) does not have an influence on the provision of signage in MPEs.

3. Develop Initial and Final Reachability Matrix: The principles of ISM require that an initial reachability matrix is developed from the SSIM – Table 8.5. The term reachability refers to whether a factor is accessible or influences other factors. The initial reachability matrix is a binary matrix derived from converting the SSIM by substituting the symbols F, R, FR, X with 1s and 0s (Wang et al., 2008; Attri et al., 2013).

The ISM principles for converting the SSIM to initial reachability matrix is as follows;

I. If the \((i, j)\) entry in the SSIM is F, then the \((i, j)\) entry in the reachability matrix becomes 1 and the \((j, i)\) entry becomes 0.

II. If the \((i, j)\) entry in the SSIM is R, then the \((i, j)\) entry in the reachability matrix becomes 0 and the \((j, i)\) entry becomes 1.

III. If the \((i, j)\) entry in the SSIM is FR, then both \((i, j)\) and \((j, i)\) entries in the reachability matrix all become 1.
IV. If the \((i, j)\) entry in the SSIM is \(X\), then both \((i, j)\) and \((j, i)\) entries in the reachability matrix all become 0.

The principle above is applied in Table 8.6 to arrive at the initial reachability matrix while Table 8.7 illustrates the final reachability matrix denoting the driving and dependency power of each factor.

The final reachability matrix incorporates the concept of transitivity. The ISM defines transitivity between factors as, if factor A leads to/is related to B, and B leads to/is related to C, then A leads to/is related to C (Kumar and Kant, 2013a). In essence, the final reachability matrix illustrates the direct and indirect relationship between the factors within a system. Based on the outcome of the transitivity, the driving and dependence power of each factor is determined.

The driving power of a particular factor is the total number of factors including itself that it may help achieve or alleviate while the dependence power of a factor is the total number of factors including itself that can help achieve or alleviate the factor (Chandramowli et al., 2011). A higher driving power indicates the level of influence the factor has on other factors while a high dependence power reflects the level to which the factor is affected or dependent on other factors (Poduval et al., 2015).
<table>
<thead>
<tr>
<th>Factors</th>
<th>A. Provision of appropriate market facilities and infrastructure</th>
<th>B. Sensitisation &amp; orientation</th>
<th>C. Collection of waste at appropriate time(s)</th>
<th>D. Improved frequency in collection times</th>
<th>E. Daily clean-up &amp; market sanitation</th>
<th>F. Monitoring &amp; supervision of waste management practices</th>
<th>G. Imposition of fines</th>
<th>H. Employment of market cleaners</th>
<th>I. Provision of signage</th>
<th>J. Provision of waste management experts</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>B. Sensitisation &amp; orientation</td>
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<td>1</td>
<td>0</td>
<td>0</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
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</tr>
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<td>C. Collection of waste at appropriate time(s)</td>
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<td>1</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>D. Improved frequency in collection times</td>
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<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0</td>
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<td>0</td>
</tr>
<tr>
<td>E. Daily clean-up &amp; market sanitation</td>
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<td>0</td>
<td>0</td>
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<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
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<td>F. Monitoring &amp; supervision of waste management practices</td>
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<td>1</td>
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<tr>
<td>G. Imposition of fines</td>
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<td>1</td>
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<tr>
<td>H. Employment of market cleaners</td>
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<tr>
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<tr>
<td>J. Provision of waste management experts</td>
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</tbody>
</table>
### Table 8.7: Final Reachability Matrix Incorporating Transitivity, Driving Power and Dependence Power

<table>
<thead>
<tr>
<th>Factors</th>
<th>A. Provision of appropriate market infrastructure</th>
<th>B. Sensitisation &amp; orientation</th>
<th>C. Collection of waste at appropriate time(s)</th>
<th>D. Improved frequency in collection times</th>
<th>E. Daily clean-up by traders &amp; market sanitation</th>
<th>F. Monitoring &amp; supervision of waste management practices</th>
<th>G. Imposition of fines</th>
<th>H. Employment of market cleaners</th>
<th>J. Provision of signage</th>
<th>K. Provision of waste management experts</th>
<th>Driving Power</th>
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</thead>
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</tr>
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<td>B. Sensitisation &amp; orientation</td>
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<td>1</td>
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<td>0</td>
<td>1#</td>
<td>0</td>
</tr>
<tr>
<td>C. Collection of waste at appropriate time</td>
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<tr>
<td>D. Improved frequency in collection times</td>
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<td>E. Daily clean-up &amp; market sanitation</td>
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<td>1</td>
<td>0</td>
<td>1###</td>
<td>7</td>
</tr>
<tr>
<td>G. Imposition of fines</td>
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<td>0</td>
<td>0</td>
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<td>1###</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0###</td>
<td>4</td>
</tr>
<tr>
<td>H. Employment of market cleaners</td>
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<td>8</td>
</tr>
<tr>
<td>K. Provision of waste management experts</td>
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<td>1</td>
<td>1</td>
<td>1##</td>
<td>1##</td>
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<td>10</td>
<td>2</td>
<td>6</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** # denotes transitivity
The initial reachability matrix (Table 8.6) illustrates the direct relationship between factors based on the conversion from the SSIM (Table 8.5). For instance, the relationship of factor A and K in Table 8.5 is ‘R’, thus cell AK and KA in the initial reachability matrix are considered as 0 and 1 respectively. This means the provision of waste management experts within MPEs would enhance the provision of appropriate market infrastructure regarding SWM. This indicates that if we have waste experts within markets, they will determine the provision of appropriate market infrastructure in terms of SWM. The waste experts would determine the facilities and infrastructure that would enhance SWM practices in MPEs.

However, there exist indirect relationships between these factors that are not reflected in Table 8.6. The final reachability matrix (Table 8.7) incorporates these indirect links (transitivities) and indicates the driving power and dependence power of each factor. For instance, from Table 8.7, factor A is directly related to factor F, and factor F is related to factor C. Therefore, there exists an indirect relationship between factor A and C and the concept of transitivity is applied. This approach is applied to all other factors in order to determine the transitivity between factors.

Based on Table 8.7, the factors with higher driving powers are; provision of waste management experts within MPEs, provision of appropriate market infrastructure, provision of signage, sensitisation and orientation, collection of waste at appropriate time(s) and monitoring and supervision of waste management practices. It then means these factors have a high level of influence on the other factors and strongly influences SWM practices in MPEs. Also, the provision of appropriate market infrastructure, the employment of market cleaners and the provision of waste management experts within MPEs were factors that are least affected by other factors in enhancing SWM practices in MPEs based on their low dependency power.

4. Define Reachability, Antecedent and Intersection Set, and Develop Level Partition: The levels on the ISM were derived from utilising the final reachability matrix to determine the reachability, antecedent and intersection Set.
A reachability set of a factor consists of the factor itself and other factors it influences while the antecedent set consists of the factor itself and other factors that may influence the factor (Kumar and Kant, 2013a). These are factors allotted ‘1’ in the rows and columns of the particular factor in Table 8.7. For instance, the reachability set for factor A as indicated in Table 8.7 is A, B, C, D, E, F, G, and J while its antecedent set is A, J and K.

The Intersection set consist of factors common to both the reachability and antecedent sets (Poduval et al., 2015). Thus, using the same example, the intersection set for factor A is A, J.

The level is derived from factors which have the same reachability and intersection sets and these factors occupy the top level of the ISM (Wang et al., 2008). Determining the level enables the development and structure of the ISM (Kumar and Kant, 2013a), as the ISM is designed based on the different levels ascribed to the factors from the level partition tables. Having identified the top level factors, the process is repeated in order to determine the factors for the next level until the level of each factor is found (Attri et al., 2013).

The reachability, antecedent and intersection set and the level partition for the factors being considered for this study is illustrated in Table 8.8 - 8.12.

**Table 8.8: Level 1 of ISM Influence Based Model**

<table>
<thead>
<tr>
<th>Factor</th>
<th>Reachability Set</th>
<th>Antecedent Set</th>
<th>Intersection Set</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>B, D, E, F, G</td>
<td>A, B, C, D, F, J, K</td>
<td>B, D, F</td>
<td>I</td>
</tr>
<tr>
<td>H</td>
<td>B, E, G, H</td>
<td>H, K</td>
<td>H</td>
<td>I</td>
</tr>
<tr>
<td>K</td>
<td>A, B, C, D, E, F, G, H, J, K</td>
<td>K</td>
<td>K</td>
<td>I</td>
</tr>
</tbody>
</table>
Table 8.9: Level 2 of ISM Influence Based Model

<table>
<thead>
<tr>
<th>Factor</th>
<th>Reachability Set</th>
<th>Antecedent Set</th>
<th>Intersection Set</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>A,C,D,J</td>
<td>A,J,K</td>
<td>A,J</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>C,D,J</td>
<td>A,C,J,K</td>
<td>C,J</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>D</td>
<td>A,C,D,J,K</td>
<td>D</td>
<td>II</td>
</tr>
<tr>
<td>H</td>
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<td>II</td>
</tr>
<tr>
<td>K</td>
<td>A,C,D,H,J,K</td>
<td>K</td>
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</tr>
</tbody>
</table>

Table 8.10: Level 3 of ISM Influence Based Model

<table>
<thead>
<tr>
<th>Factor</th>
<th>Reachability Set</th>
<th>Antecedent Set</th>
<th>Intersection Set</th>
<th>Level</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>K</td>
<td>A,C,D,H,J,K</td>
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</table>

Table 8.11: Level 4 of ISM Influence Based Model

<table>
<thead>
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<th>Antecedent Set</th>
<th>Intersection Set</th>
<th>Level</th>
</tr>
</thead>
<tbody>
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<td>A</td>
<td>A</td>
<td>A,K</td>
<td>A</td>
<td>IV</td>
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<tr>
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<td>A,K</td>
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</tbody>
</table>

Table 8.12: Level 5 of ISM Influence Based Model

<table>
<thead>
<tr>
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<th>Reachability Set</th>
<th>Antecedent Set</th>
<th>Intersection Set</th>
<th>Level</th>
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<td>K</td>
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</table>

Based on the analysis in Table 8.8 – 8.12, factors B, E, F and G have the most limited relationship, thus these factors will occupy the upper portion of the ISM. The factors that occupy the top level (Level 1) of the ISM as mentioned by Attri et al. (2013) are factors that will not lead the other factors above their own level in the hierarchy. They are said to be factors that will influence the effectiveness of the system. The bottom of the ISM is occupied by factor K and A. This indicates that these factors have a strong driving power and have a significant impact on the entire system.

The application of the various levels to the ISM aids in the visualisation of the interactions between the various factors and provides an orderly direction in understanding the factors that will enhance SWM practices in MPEs.

5. Classification of Powers of the Factors: The factors were further classified utilising the Impact Matrix Cross-Reference Multiplication Applied to a
Classification (MICMAC) analysis in order to analyse the influence and dependence of all the factors being considered. MICMAC analysis is a technique utilised to interpret the behaviour of each factor within a system by plotting each factor’s dependence versus its driving power determined from the reachability matrix (Chandramowli et al., 2011). The MICMAC analysis enables the categorisation of the factors being considered into four cluster classification which is later represented on a graph. The classification as utilised by Wang et al. (2008), Kumar et al. (2015b) and (Poduval et al., 2015) is described as follows;

I. **Autonomous or excluded factors**: These are factors with weak driving and dependence powers. They are relatively disconnected from the system as they have just a few links within the system which is usually not strong. As a result of this disconnect, to an extent, they can be handled separately from the rest of the system. Thus, they do not have significant influence and they can also pass as unimportant factors.

II. **Dependent factors**: These are factors with very weak driving power and highly dependent on other factors. They are strongly influenced by the system; thus their driving factors should be addressed before attending to such factors.

III. **Linkage Factors**: They are factors with high driving and dependence power. As a result of their nature (high driving and dependence power), they cause instability within the system. This is because they have high powers to affect and be affected by other factors. They are also affected by their own actions making them difficult to address.

IV. **Independent Factors**: They are factors with strong driving power and a weak dependence power. These factors influence the system as any action on these factors have an effect on their dependent factors. As a result, such factors should be addressed early.

The driving and dependence power from the final reachability matrix (Table 8.7) is plotted into a graph (Figure 8.1) in order to reflect and analyse the behaviour of the factors being considered in this study.
Figure 8.1: MICMAC Graph Demonstrating the Driving Power versus Dependence Power of Study Factors.

The analysis in Figure 8.1 reveals that the factors that inhibit adequate SWM practices in MPEs were both autonomous, dependent, linkage and independent factors.

As a result of its weak driving and dependence power, factor H (Employment of market cleaners) is an autonomous factor within the system. This indicates that this factor can be managed separately from the system as it does not have an impact on the other factors and the system as a whole. This finding complements the findings from quantitative data sets (Table 8.1 and 8.2) on the importance of the employment of market cleaners in enhancing SWM practices in MPEs. Data from field notes also support this finding, as it reveals the reservations of the stakeholders regarding the employment of market cleaners.

Factor D (Improved frequency in collection times), E (Daily clean up and market sanitation) and G (Imposition of fines) are dependent factors and as such are strongly influenced by other factors (Factor D depends on every factor except E, G and H. While factors E and G depends on all the factors being studied). It is
important to address the factors they depend on before considering these factors so as to avoid them reoccurring during implementation.

The linkage factors from the analysis in Figure 8.1 were factor B (sensitisation and orientation), C (Collection of waste at appropriate time), F (Monitoring and supervision of waste management practices) and J (Provision of signage). These factors cause instability within the system as a result of high dependency and driving power. This denotes that they have a very high power to affect other factors and also be affected by other factors too. For instance, the collection of waste at appropriate time(s) is a factor that if adequately addressed will influence other factors thereby enhancing SWM practices in MPE. However, it is also a factor that needs to be managed adequately. In essence, if waste is not collected at the appropriate time, the impact is high as it drives other factors (B, D, E, F, G, and J) and this will have an enormous impact on SWM practices in MPEs.

Based on the data in Figure 8.1, factor K (Provision of waste management experts within MPEs) and A (Provision of appropriate market infrastructure) are key factors in enhancing SWM practices in MPEs. These are independent factors that form the basis of enhancing SWM practices in MPEs. They should be given top priority as actions on them influence the entire system as a result of their high driving power. However, when compared with quantitative data sets (Table 8.1 and 8.2), factor K is ranked as one of the least important factors. Field notes on the other hand reveals that the stakeholders consider this factor as a very important factor that would be a good development in enhancing SWM practices. However, the traders were concerned about the financial implications it might have on them. They perceive the services rendered by waste management experts will be financially borne by them thus, the factor is ranked among the least important factors from quantitative data sets.

6. ISM Model: The ISM model is designed by placing at different levels, the various levels determined from the level partitioning (Table 8.8 – 8.12). This results in a structured view of the interactions between the barriers and enables the understanding of the interrelationship of the barriers as depicted in Figure 8.2.
Based on the principles of ISM, the transitivity between factors were not reflected in the ISM model (Wang et al., 2008; Kumar et al., 2015b).

Figure 8.2: ISM Influence based Model for Enhancing Solid Waste Management Practices in MPEs

The provision of waste management experts within MPEs and the provision of appropriate market infrastructure are positioned at the bottom of the ISM influence model (Figure 8.2). Based on the principles of ISM, this reveals they are crucial factors to enhancing SWM practices in MPEs. These factors are also classified as independent factors (Figure 8.1) as they have a high driving power and low dependence power. This means they have significant influence on the overall performance of the system and the factors above them. For instance, the provision of waste management experts within MPEs does not depend on any of the factors within the system but influences all the factors within the system. Also,
the provision of appropriate market infrastructure depends on the provision of signage and waste management experts but drives all other factors except the employment of market cleaners and the provision of waste management experts. It then suggests that, an early attention to the factors at the bottom of the ISM will have an impact on the entire system and ease intervention on the other factors.

At the top of the ISM influence model are sensitisation and orientation, daily clean up and market sanitation, monitoring and supervision of SWM practices and the imposition of fines. In line with the ISM principles, factors at the top of the ISM model do not lead other factors above their own level. Also, based on the MICMAC Graph - Figure 8.1 - these factors are both dependent and linkage factors. This then suggests it is advisable that interventions addressed at tackling daily clean up and market sanitation, and the imposition of fines should be implemented after its driving factors have been addressed. Data in Table 8.7 reflects that sensitisation and orientation, and monitoring and supervision of SWM practices are the driving factors of daily clean up and market sanitation, and imposition of fines. Being linkage factors themselves (sensitisation and orientation, and monitoring and supervision), these factors should be given additional and adequate attention as they have high driving and dependence power. This thus suggests that the factors which occupy the top position of the ISM model will influence the effectiveness of SWM practices within MPEs. Also, data in Table 8.4 further reveals a very high level of influence between the factors occupying the top of the ISM influence based model.

8.4. Discussions

Although the provision of waste management experts within MPEs was ranked amongst the least important factors from quantitative data sets – Table 8.1 and 8.2, data from field notes taken in course of administering the questionnaires reveal that the low rankings was based on the perception of the traders that the introduction of waste experts within MPEs will increase their financial burden in terms of market sanitation fee. However, the traders acknowledged the importance of the factor to enhancing SWM practices in MPE. Thus, in analysing data for this chapter, the field note data were considered.
8.4.1. The Interdependency of Factors that could Enhance Solid Waste Management Practices in Markets

A key finding from this chapter reveals that the provision of waste management experts within MPEs and the provision of appropriate market infrastructure are significant factors to addressing SWM concerns in MPEs. The provision of appropriate market infrastructure is ranked as one of the most important factor from quantitative data sets (Table 8.1 and 8.2) and it occupies the bottom of the ISM model (Figure 8.2). It therefore implies that a higher priority should be given to these factors in order to enhance SWM practices in MPEs. This is based on their driving power as they affect other factors the most and are least affected by the other factors. The provision of waste management infrastructure has been reiterated by various researchers as a key factor that influences SWM practices (Awosusi, 2010; Agwu, 2012; Ezeah and Roberts, 2012). The near absence of waste management infrastructure according to Ezeah and Roberts (2012) compounds SWM practices. Based on the analysis in Figure 8.2, the provision of waste management experts within MPEs and the provision of appropriate market infrastructure are thus crucial to enhancing SWM practices in MPEs.

Quantitative data sets in Table 8.1 and 8.2 illustrates that sensitisation and orientation, daily clean up and market sanitation, collection of waste at appropriate time(s), and monitoring and supervision of waste management practices are among the most important factors that would enhance SWM practices within MPEs. This finding to an extent complements the outcome of the ISM influence based model (Figure 8.2), as sensitisation and orientation, daily clean up and market sanitation, monitoring and supervision of waste management practices, and imposition of fines are classified as factors that will determine the effectiveness of SWM practices in MPEs.

Through the application of ISM, this study has remedied a weakness in the approaches adopted in addressing SWM problems. The advantage of the application of the ISM is that unlike other studies that have provided the barriers and success factors to waste management concerns (Bartone, 1995; Ezeah and Roberts, 2012; Mukui, 2013; Amuda et al., 2014), the application of the ISM for
this study has provided the interrelationship and valuable insights as to how the factors being studied interact with one another. The identification of the relationship between the factors provides the market facilities manager with adequate knowledge on the action to be taken. For instance, knowledge and awareness of SWM practices were key factors identified by several literature (Babayemi and Dauda, 2010; Ezeah and Roberts, 2012; Stanley et al., 2012) to addressing SWM concerns. However, analysis of the ISM influence based model for this study reveals that although sensitisation and orientation will enable effective SWM in MPEs, it is also an important factor that changes the behaviour of the system as a result of its high driving and dependency power. It is thus important to also address the factors it drives and depends on. Addressing these (driving and dependent) factors will enable the effectiveness of sensitisation and orientation.

10 factors have been analysed in this chapter, revealing their relative importance, severity effect, interrelationship, and their driving and dependence power. However, the interdependence of the factors is a key underlying factor that should be considered in developing SWM systems for MPEs. The findings from the analysis clearly indicates that the implementation of SWM strategies for MPEs may not achieve its objectives if the interdependency of the 10 factors is ignored. Thus, in addition to the four underlying factors (Section 7.8.5) which are related to the people component of the facility, there is an inherent underlying factor that will underpin the attitudes of the market users towards waste. This, thus identifies a fifth underlying factor: the interdependency of the 10 factors.

Chandramowli et al. (2011) and Tuan et al. (2014) advocated for the incorporation of the perspective of different stakeholders in order to reduce variation and improve the validity of the ISM model. The outcome of the ISM influence based model for this study incorporated contributions from the perspective of key market stakeholders. Thus, the outcome will have a significant implication in guiding managers of markets in developing and delivering intervention strategies to enhance SWM practices in MPEs. However, the factors addressed in the study were those that impede on the attitudes of the market users as regards waste.
8.5. Summary and Conclusions

This chapter has provided findings from both quantitative and qualitative analysis of the factors that could influence SWM practices in MPEs. Through the application of RII, the relative importance of one factor in relation to another was determined. The utilisation of SI aided in determining the effect of the factors on the SWM practices of the market users. The ISM technique provided valuable insights as to the interactions and interdependencies between the factors.

Data from the quantitative and qualitative findings were triangulated and it was found that the provision of waste management experts within MPEs and the provision of appropriate market infrastructure are crucial factors to enhancing SWM practices in MPEs. While sensitisation and orientation, daily clean up and market sanitation, collection of waste at appropriate time, monitoring and supervision of waste management practices, and the imposition of fines are factors that will enable effective SWM practices in MPEs. In relation to the initial four factors that underpins the attitudes of the market users, the interdependencies of the 10 factors is considered as a fifth factor.

The MICMAC graph complements the ISM influence based model in providing analysis on the various factors. The development of relationships and interactions between the various factors offers guidance and insights to market facilities managers in arriving at decisions in combating SWM concerns. Thus, this can assist market facilities managers in overall barrier management. Besides determining the interdependencies of the factors, the study further determined the level of influence between factors - Table 8.4. This can also provide guidance to market managers in terms of the level of influence between factors.

The findings from the data also have financial implications as several of the factors cannot be mitigated without adequate funding. For instance, the factors that occupy the bottom of the ISM influence based model (Factors A and K) are factors that will require financial commitments. It therefore implies that enhancing SWM in MPEs also requires adequate financial investment.

The next chapter is the final chapter of the thesis. The key findings of the study will be summarised and the contributions of this study will be presented.
Chapter 9. Conclusions and Recommendations

9.1. Introduction

This research has explored the dynamics of African urban marketplaces with particular focus on SWM practices. In undertaking this study, two core conversations were brought together and explored: FM and SWM, with particular reference to the African urban marketplace environment.

The study is based on the FM context, and focuses on the environmental management component with particular reference to SWM. The ‘facility’ to be managed is the MPE, which is owned by Local Governments. The targeted organisational objective is the provision of a safe and clean environment.

The research provides an in-depth understanding of the dynamics of the MPE in order to identify the key underlying factors that underpin the attitudes of market users towards waste. The primary purpose is to provide a safe and clean MPE by improving SWM practices.

To achieve the aim, the study had four key objectives:

1. To investigate the nature of African urban marketplaces in order to develop an in-depth understanding of the multi-dimensional nature and social expectations of its markets, viewed as a facility in the FM context;
2. to examine SWM practices in the urban marketplace environment (MPE) in Nigeria with particular consideration to the effect of market remodelling;
3. to identify and validate the key factors that could enhance SWM practices of market users;
4. to validate the factors that market facilities managers need to incorporate in the development of SWM strategies for MPEs.

Literature has been insufficient and have not been systematic in addressing the barriers and success factors to waste management practices (Bartone, 1995; Ezeah and Roberts, 2012; Mukui, 2013; Amuda et al., 2014). Through a systematic methodological approach, this study appraised the SWM practices in MPEs with particular focus on the market users. By investigating the nature of
markets and market customs in relation to SWM practices, this study provides a systematic and strategic approach to addressing the factors that would enhance SWM practices in MPEs. This has been achieved by incorporating the perspective of the different market stakeholders in the development of a solid waste influence based model: a model that could serve as a guide in the decision-making processes of the market facilities managers regarding SWM. Interestingly, the findings of this study challenge the existing literature and conventional approaches that apportion blame for SWM problems on the users (Schubeler et al., 1996; Imam et al., 2008; Balogun, 2012).

In undertaking this study, the everyday culture and routine, and the interactions that occur in marketplaces were highlighted. The study revealed processes of transformation of markets and ideas on the problems and constraints existing in MPEs. The social geography of different spaces was revealed within the case studies and the study introduced a new perspective to analysing the marketplace: as a facility.

9.2. Work Accomplished

9.2.1. Research Objectives

To investigate the nature of Africa urban marketplaces in order to develop an in-depth understanding of the multi-dimensional nature and social expectations of its markets, viewed as a facility in the FM context.

Through the review of literature (Chapter 3), the study examined the nature of African urban marketplaces. The inherent features, settings and marketplace stakeholders and their role were determined. Literature also revealed the marketplace as a fundamental focal point of African societies as a result of its configuration.

Further understanding of MPEs was determined through empirical study of four case studies: two remodelled and old markets each and presented as Chapter 6 of the study. The empirical study revealed the everyday culture and routine of market users, the interactions that occur between the market users themselves, and between the market users and the MPE. The study complements existing
literature on the impact of the interactions on the attitudes of the market users as the frequent interactions tend to have an influence on the market users even outside the MPE. The study reveals that although the creation of new markets – remodelling - presents a different way of how the market users consume and perceive the space, both spaces still enjoy the special qualities that gives the marketplace character.

Based on the observations of the four cases, a conceptual model depicting the MPE was developed (Figure 6.7). The model was produced based on initial conceptualised model of the FM system (Figure 2.1 and 2.3). The model depicts the MPE as a facility indicating the four components of a facility (as illustrated in Figure 2.1); the people, the business, the building, facilities and infrastructure, and the business support services. The model also illustrates the inputs into markets: goods and services, information, money, labour, plant and machinery, and the outputs: goods and services, information, money, labour, plant and machinery, behavioural change, and solid waste and noise pollution.

To examine SWM practices in the urban marketplace environment (MPE) in Nigeria with particular consideration to the effect of market remodelling.

The review of literature (Chapter 4: Section 4.4) reveals that SWM practices in Nigeria is characterised by inefficiencies which is no different in MPEs.

The empirical phase explored SWM practices in marketplaces, the impact of the remodelling of markets on SWM practices and the factors that could enhance SWM practices in MPEs. Findings of the study reveal poor attitudes towards handling and disposal of waste especially in old markets. Waste is littered, dumped and heaped indiscriminately at corners of the market. Traders were busy with trade transactions, chatting with colleagues, prospective buyers or visitors, or staging their goods and barely attend to their waste during market hours. Whereas the remodelling of markets creates an identity that is valued by the market users and this to an extent has an impact on their waste disposal habits. Also, the provision of basic facilities such as waste disposal areas have enhanced waste disposal habits in the remodelled markets.
The study also found that the practice of reuse and recycling is being carried out in marketplaces. Materials such as cartons, plastic bags, shells of seafood, remnants from dried seafood, plastic buckets and bottles were the common materials re-used or recycled. However, further investigation revealed the traders do not necessarily understand the implications of these elements (re-use and recycling) of waste management but rather the practice is undertaken based on economic benefits and it also aids trade activities.

To identify and validate the key factors that could enhance solid waste management practices of market users

The study identified through semi-structured interviews, 10 factors that could enhance SWM practices of the market users. The factors were further validated utilising focus group discussions. These factors are summarised below in no particular order in the context in which they were considered:

*Provision of appropriate market infrastructure:* Typical examples given by the market stakeholders as appropriate infrastructure is the provision of closed drains as opposed to open drains as seen in the old markets. The provision of appropriate market infrastructure thus refers to infrastructure suitable for the market environment that will enhance SWM practices.

*Sensitisation and reorientation:* This refers to creating awareness and knowledge of SWM practices amongst market users and also relating the implication of their SWM practices. Extracts from interviews reveal that several of the market users especially the traders do not have knowledge of SWM practices.

*Collection of waste at appropriate time(s):* This questions the appropriate time to collect waste in MPEs as frequent collection does not address the problem owing to the busy nature of markets.

*Improved frequency in collection times:* This factor can only be determined if appropriate collection time(s) is established. For the market stakeholders, improved frequency will entail the collection of waste twice daily – morning and evenings.
Daily clean-up and market sanitation: This factor reveals the market custom of cleaning, tidying up and disposing waste in the morning. It also reveals the expectations of every day market life as the traders were of the opinion that the daily clean up before display of goods and market sanitation will enhance SWM practices.

Monitoring and supervision of waste management practices: This entails the supervision of waste management practices by the market regulators.

Imposition of fines: This involves imposing monetary penalties for littering and indiscriminate dumping of waste.

Employment of market users: This refers to the employment of market cleaners in order to enhance SWM practices.

Provision of signage: This refers to the provision of signage guiding market users as to where and how to dispose their waste.

Provision of waste management office (waste experts) within MPEs: Data generated reveal the need for personnel with SWM expertise within markets.

The provision of infrastructure, sensitisation and orientation, monitoring and supervision, and collection times are factors that have been identified in existing literature (see Chapter 4: Section 4.6). However, the collection of waste in MPE questions the appropriate time to collect waste. It is a crucial factor to addressing SWM concerns due to the busy nature of MPEs.

To validate the factors that market facilities managers need to incorporate in the development of SWM strategies for MPEs.

Through the application of RII and ISM methodology, the 10 identified factors that could enhance SWM practices in MPEs was evaluated. The study utilised questionnaires and focus group as instruments to achieve this objective.

The RII provided the relative importance of one factor over the other (Table 8.1 and 8.2) while the ISM provided the interactions and interdependencies between
the factors and at the same time knowledge on how to manage the factors (Figure 8.2).

The five most important factors that would enhance SWM practices as perceived by the stakeholders were:

- (1) Provision of appropriate market infrastructure ($RII = 0.932$) and Sensitisation and reorientation ($RII = 0.932$)
- (3) Daily clean and market sanitation ($R = 0.922$)
- (4) Collection of waste at appropriate times ($RII = 0.920$) and
- (5) Monitoring and supervision of waste management practices ($RII = 0.898$)

Whereas the two least important factors were:

- (9) Provision of waste management office (waste experts) within marketplaces ($R = 0.851$) and
- (10) Employment of market cleaners ($R = 0.677$)

While the provision of appropriate market infrastructure and the sensitisation and orientation of market users regarding SWM practices were the most important factors in old market (South) and old market (North) respectively, the daily clean up and market sanitation is perceived as the most important factor by the stakeholders in the remodelled markets. Again, the perception of the users of the remodelled markets is associated with the identity that comes with the remodelling of markets which has resulted in the market users adopting new values and attitudes in terms of SWM practices in relating with the new environment.

Data from field notes taken in the course of administering the questionnaires reveal that the provision of waste management office (waste experts) within marketplaces and the employment of market cleaners was ranked amongst the least important factors as they were perceived by the stakeholders as factors that will result in financial burden. These findings raise questions as to the willingness
of the market users to pay for services that will enhance and improve market life and operations.

Through the utilisation of ISM, an ISM based influence model depicting the interactions and interdependencies of the factors was developed (See Figure 8.2). The model provides guidance to the overall management of the factors. The study found that the provision of waste management experts within MPEs and the provision of appropriate market infrastructure have high influence on the other factors being considered as a result of their high driving and low dependence power. Thus, these factors were established as the crucial factors in addressing SWM concerns in MPEs. As a result of their high dependence powers, sensitisation and orientation, daily clean up and market sanitation, monitoring and supervision, and imposition of fines was established as factors that will enable effective SWM practices in MPEs.

Also, findings reveal that the interdependence of the 10 factors is a key underlying factor that will underpin the attitudes of the market users towards waste. Thus, in relation to the initial four factors that underpins the attitudes of the market users, it is considered as a fifth factor.

9.2.2. Research Aim

To provide an in-depth understanding of the dynamics of the MPE in order to identify the key underlying factors that underpin the attitudes of market users towards waste

Through the case studies of the four MPEs in Port Harcourt, this thesis reveals that rather than thinking of the marketplace as a given entity, the materiality of the marketplace, the everyday interactions and inter-mingling of human beings, the objects and the expectations of the space all create the marketplace environment. The study has shown the use of space and everyday customs and routine regarding SWM practices in both old and remodelled markets, and how the process of remodelling MPEs creates a different expectation and perception on its users. Schein (1984) describes these changes as the unconscious and taken-for-granted beliefs and values that shape the thoughts and perception of a group.
Furthermore, the perception of the users of the remodelled markets regarding SWM practices is different from those in the old markets. The remodelling of market structures creates an identity that is valued by the market users. Although not a perfect system, the users of the remodelled markets were now conscious of their SWM practices as the socio-cultural perceptions of the older markets as unclean feed into the norms and expectations established at the remodelled markets. The attitudes of the users of the remodelled markets is characterised by the threat of the ‘other’. Staszak (2009) describes this as a social construction phenomenon in the use of space whereby users create an in-group and out-group identity where the out-group is susceptible to discrimination and stereotyping. The old markets being congested and characterised by old and dilapidated structures has an impact on SWM practices of its users. As a result of the physical environment, the users of the old markets do not pay as much attention to solid waste and the old markets were characterised by littering and indiscriminate dumping. The users of the old markets dispose their waste in open drains, on the ground or unauthorised collection points and the traders were oblivious of the waste generated and littered around their stores as they carry out trade activities. Based on the foregoing, it can be deduced that the congested nature and dilapidated structure within MPEs influence SWM practices of the market users.

The study also found that the key underlying factors that underpin the attitudes of the market users towards waste were the lack of understanding of market custom and operations regarding SWM, lack of communication and consultation, implementation problems, the use of discretionary powers, and a fifth factor - the dependency of the factors as evident in the ISM analysis. The study found a disconnect between waste disposal and collection times. Whilst the market custom is such that the traders prefer to sweep, tidy up and dispose their waste in the mornings, the waste collection times for markets were in the evenings. The waste handlers consider evenings as the appropriate time to collect waste with reasons being that waste comes out in the evening and also so the traders were not met with waste from the previous day. This suggests the use of discretionary powers and a lack of consideration of market custom in developing SWM strategies for MPEs and this also has an implication on SWM practices. The study
reveals that, the lack of communication and non-consultation of the market users especially the traders, and the use of discretionary powers by the waste handlers and the market regulators presents a classic problem of implementation.

The study questions the current approach (top-to-bottom) to SWM in MPEs. Furthermore, based on the factors presented that underpin the attitudes of the market users, the study reveals that attitudinal change lies primarily with the market managers rather than the market users. This is so because the market managers are in a better position to deliver change in terms of overall SWM processes which will include the sensitisation and reorientation, and supervision and monitoring of SWM activities. However, this study argues that market facilities managers must have knowledge of market practices and custom in order to be efficient in delivering SWM solutions. The current approach to SWM in marketplaces presents a classic answer to the research question as to why we still have markets where waste is a problem.

Findings of this study have thus presented an in-depth and more sophisticated understanding of attitudes from a range of different market stakeholders. The findings provide a new perspective to appraising attitudes towards waste and challenges the perception of how managers run markets.

9.3. Conclusions

This study has responded to the challenges set by the World Bank (2009a) global report that established the neglect of SWM research in urban marketplaces in developing countries despite the high risk to public health and environmental problems posed by waste in marketplaces. The significance of this study lies within the 2020 target of SDGs – Goal 12 – as the study provides an understanding of SWM practices of market users in order to address issues associated with the handling and disposal of waste within the MPE which in turn poses risk to public health and the environment.

Waste is a reoccurring theme in the management of markets. However, in as much as literature has identified attitudes as a factor that exacerbates SWM concerns (Schubeler et al., 1996; Imam et al., 2008; Balogun, 2012), there were no clear indications or evidence of existing literature of an understanding of the
factors that underpin attitudes towards SWM practices in MPEs. This study thus provides an in-depth understanding of the dynamics of the MPE in relation to SWM practices and has established factors underpinning the attitudes of the market users towards waste. The study has also evaluated the factors that could enhance the SWM practices of the market users, revealing their interrelationship, driving and dependency powers.

Based on the findings of this research, this study has thus made the following contributions to the limited research pertaining SWM in MPE facility:

- Through an empirical study of the MPE as a facility, this study has provided a better understanding of the dynamics of the MPE; the stakeholders, the inputs, the processes of transformation, the everyday culture and routines, the social geography and the structure of the different spaces, and the problems and constraints that stall MPEs. The study also reveals the impact of remodelling old markets on the market culture by establishing existence of cultural difference between the old and the remodelled markets. These are significant in order for the facilities manager to be efficient in the delivery of SWM services in MPEs.

- Through in-depth qualitative methods, the study adds a deep understanding of attitudes of market users towards SWM practices. Existing literature on SWM practices provides a blanket appraisal of attitudes towards waste and has incessantly tagged the attitudes of the people towards waste as ‘poor’. This study has provided a more sophisticated and nuanced reappraisal of SWM practices in MPEs and argues that attitudinal change has to come from the market managers in order to effect better SWM practices and behaviours. The study has thus transposed the focus from the users to primarily the market managers as they are in a better position to deliver change in the overall SWM process.

- Through the application of the ISM methodology for this study, the study provides a basis to inform market facilities managers of the interactions and interdependencies of the factors that could enhance SWM practices in MPEs. In contrast to existing literature which has only identified
attitudinal change factors, this study has developed a model (Figure 8.2) that provides the interrelationships and interdependencies between these factors. Equipped with this knowledge, the facilities manager would be able to objectively establish a prioritisation for the factors. For example, the provision of waste management experts and the provision of appropriate market infrastructure have high influence on the other factors and as such should be considered as crucial factors to enhancing SWM practices in MPEs. Whereas, as a result of their high dependency powers, sensitisation and orientation, daily clean up and market sanitation, monitoring and supervision of waste management practices, and imposition of fines should be considered as critical factors for effective SWM practices in MPEs. The developed model provides further details sufficient to guide MPE facilities managers to aid improve performance in SWM.

- The review of literature reveals collection times for waste is significant to addressing SWM concerns. This study provided a better understanding of waste collection times in the context of MPEs. The contribution is made through qualitative research involving observation of the research subject and interviews with market stakeholders. The study has redirected the concerns of collection times to a significant question of ‘what is the appropriate time to collect waste in MPEs?’ It reveals that the understanding of market customary practices and the formal and informal life of the marketplace is significant to determining waste collection times. The research established that, increasing the frequency in waste collection times will not address SWM concerns in MPEs. There is a need to determine the specific appropriate time to collect waste as a result of the nature of marketplaces. This will require the input from all market stakeholders especially the traders.
9.4. Recommendations for Market Facilities Management

Following the findings of this study, the research recommends the following actions be undertaken in order to address and improve efficiency in SWM concerns in MPEs:

1. There is a need to institutionalise FM services within MPEs with due consideration to the informal nature and customary practices of markets. It is necessary for market managers to be exposed to tailor-made training programs on responsibilities, customs, and SWM processes. This will promote the processes of knowledge transfer in order to improve the situation of SWM in MPEs. Equipped with an understanding of market life and SWM practices, the market managers would be in a better position to create conditions that could influence the culture of the market users.

2. Any improvement to the physical environment of the existing old markets would have a positive impact on the attitudes of the market users. To improve market life and operations in the old markets, it is therefore recommended that existing facilities such as drainages, roads, water and sanitation facilities should be developed as a short term measure if complete remodelling is unaffordable.

3. It is established that the MPE has been successfully used for delivering of various programmes by Government and non-governmental organisations aimed at educating and reaching out to the public. The Government should take advantage of the MPEs to channel focus-based education and reorientation programmes regarding SWM practices.

4. The African urban marketplace is considered to be a fundamental focal point of economic and social life for everyone irrespective of their social status. It is therefore recommended that a Bill for the provision of a clean and safe MPE should be submitted to the National Assembly. Once it becomes an Act, each State in the Federation should be encouraged to domesticate the law accordingly.
9.5. Limitations of the Research Approach

Based on the lack of research on SWM in MPEs, this study set out with an overall aim to provide an in-depth understanding of the dynamics of the MPE in order to identify the key underlying factors that underpin the attitudes of market users towards waste. Although the methodological strategy adopted for this study is appropriate in achieving the overall aim of the study, however, there are limitations of the study which is also reflected in the recommendations for future work. Below are the limitations of this study:

- One of the limitations of this study is around the research strategy adopted for the study. Due to budget constraints, the study focused primarily on the West African region – specifically Port Harcourt, Nigeria – for the primary data generation and collection. This limits the number of cases covered and thus limits the level of generalisation of the findings. However, based on the position of Hillebrand et al. (2001), the findings of this study allows for theoretical generalisation only with reference to markets with similar structure, and the critical factors investigated in this study.

- As a result of time constraints, the study was cross-sectional. The implication was a limited amount of time in understanding the dynamics of the MPE in relation to SWM practices. A longitudinal study for instance would have revealed valuable insights into the change and developments in SWM practices of the users of the remodelled markets.

- The unavailability of essential data such as the size of the markets, and access to the consultants’ report on the rationale for the remodelling of markets were also limitations encountered in the cause of undertaking this study.

9.6. Recommendation for Future Research

This study adds to the body of knowledge on SWM in African marketplaces. Based on the paucity of research in this research area, a range of future work is suggested in order to strengthen the body of knowledge;
1. The appropriate provision of facilities and services that will support and sustain the operations of an organisation is essential to the effective functioning of the organisation. It is thus necessary, that a further research be undertaken on the positioning of FM within MPEs that would guide the improvements of old markets and aid designers of remodelled markets.

2. Having established the 10 factors that could enhance SWM in MPEs, it is useful to develop a financial model for resolving the problems originating from these factors. This will assist facilities managers in prioritising implementation actions for the various MPEs, including the financial and economic viability of upgrading market infrastructure and facilities.

3. The study recognised a concern regarding the market users’ willingness to pay for SWM services and concerns regarding the rental cost in the remodelled markets. Based on these findings, there is a need for further studies to be undertaken on the market users’ willingness to pay for services and infrastructure that will enhance market life and operations.

4. Adopting the methodology utilised in this study, similar research could be undertaken in other sub-regions of Africa – North Africa, South Africa and East Africa. This will reveal any existing similarities or differences in market operations and SWM practices in the various regions.

5. Based on the review of selected successful markets in Europe (Section 3.2.1), there is need to compare and contrast successful urban marketplace practices in various countries, and develop a best practice approach.
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## APPENDIX 1: Country Classification According to Region
Source: Hoornweg and Bhada-Tata (2012).

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APPENDIX 2: Ethics Approval Form

UNIVERSITY OF BRIGHTON

SCHOOL OF ENVIRONMENT AND TECHNOLOGY

ETHICS APPROVAL FORM MPhil/PhD and STAFF RESEARCH PROJECTS

This form is to be used by MPhil/PhD students and staff seeking ethical approval for their research from the School of Environment and Technology Research Ethics and Governance Committee.

All of those completing this form and must receive approval from an appropriate ethics committee (usually the School of Environment and Technology Research Ethics and Governance Committee) prior to commencing their research.

Please read the University Guidance on Good Practice in Research Ethics and Governance before completing this form. This form should be checked carefully for typographical and grammatical errors before submission. Incomplete or badly presented forms will be returned. Supervisors of student projects have a responsibility to ensure that the guidelines are followed and that applications are properly presented.

If after considering this form the School Research Ethics and Governance Committee consider Tier Two approval is required, the Principal Investigator / Research student will be notified and this form automatically passed to the Chair of the Faculty Research Ethics and Governance Committee for consideration.

Please attach the SET Research Ethics Checklist you have already completed to this form.

Section A – Key details

1. Name of student/Principal Investigator: ADENI ABIGO

2. Name of supervisor (for MPhil/PhD students): Dr. Kassim Gidado, Dr. Jon Gates and Dr. Paul Hanna

3. Title of project (no more than 20 words): The impact of Urban Marketplaces on Effective Municipal Solid Waste Management Systems in Nigeria
4. Aims of the study

*Please summarise your aims in one or two sentences. Write no more than 100 words.*

The aim of the research is to provide an in-depth understanding of the influence of urban marketplaces in Nigeria on people’s attitude towards waste in order to effect better waste management practices in Nigeria.

The philosophy of the study is that, a waste management system that is effective at urban marketplaces could bring about a change in the attitude of people generally (in the society) since everyone in one way or the other participates in market life.

5. Research context

*A brief summary should be provided discussing the relevant published literature so that the Committee can understand the context to your research. In addition, please supply four or five up-to-date references to the relevant published literature. You may supply up to 800 words.*

The concern of municipal solid waste management in Nigeria is overwhelming. Literature by Abila and Kantola (2013), Olanrewaju and Ilemobade (2009) and Ogwueleka (2009) affirm that municipal solid waste management is one of the greatest challenges facing all tiers of government and stakeholders in Nigeria. This is exacerbated by the alarming growing rate of urban population coupled with the unavailability of the necessary infrastructure and the lack of effective waste management systems (Ogwueleka, 2009).

Most developing countries, especially in Africa, are yet to curb the challenges of waste management and the enormous problems associated with improper waste management such as flooding, degradation of the physical environment, air pollution, risk to public health, pollution to surface and ground water etc (Ogbonna et al., 2007). Palczynski (2009) identified some of the major contributory factors to poor waste management practices in Africa as: inadequate and inefficient education of all stakeholders and poor communication channels between the stakeholders (especially between the government and the civil society). Also, most waste management strategies used by African States are normally based on models of industrialised countries which usually assume totally different technical, financial and organisational framework particularly with regards to primary waste collection.

Even with the large population of developing countries (for example, Asia and Africa are the first and second most populous continents in the world respectively), waste generated in developed countries is usually higher than that in developing countries (Brunner and Fellner, 2007; Haub, 2012). However, the developed countries have achieved the first aim of waste management (to protect human beings and the environment) and are now focused on the second aim (which is the conservation of resources). Whereas the first aim still remains the main priority of developing countries (Brunner and Fellner, 2007).
Based on the foregoing, this study focuses on waste generation to waste collection phase with particular focus on the stakeholders for the purpose of achieving a clean environment.

Wambungu, 1995 states that one of the fundamental focal points of economic and social life in developing countries especially in Africa is the marketplace. Wambungu (1995) posits that government programmes such as immunisation programmes, family life education, political campaigns etc., aimed at educating and reaching out to the public could take advantage of the number of persons that visit the marketplace to convey their message/programme. A typical example and successful account is the United States Public Health Service Smallpox Eradication Programme in Mali. The success of this programme was based on the discovery that the marketplace offered the most convenient and effective medium for ensuring high vaccination coverage of the population (Imperato, 1969). In actual fact, with the volume of noise emitted at marketplaces from traders trying to outdo one another in seeking the attention of a prospective customer/buyer, loud music coming from stores trying to promote the sale of their stock, the hustling of hawkers and visitors, the exposed spices that could upset nostrils, the African marketplace is not the most convenient place. However, it was convenient and effective because of the traditional and cultural significance of the marketplace and the size of the target audience that visit the marketplace daily. Another good case is an operations research by Ladipo, et al., (1990) in Ibadan, Nigeria, investigating the feasibility of a contraceptive distribution system by using traders (trained) in the market to sell contraceptives confirmed that markets are potential channels for the distribution of contraceptives based on their ability to reach out to women and men of all ages and social status. An important finding of the research is that the traders made additional effort by taking the contraceptives home to sell to family and neighbours. It might be argued that the additional effort put in by the traders by taking the products home to family and neighbours was influenced by the profit they would derive if the entire product in their possession was sold out. But it is important not to overlook the fundamental potential and opportunity the marketplace presents; it is an avenue to reach out to the populace and introduce new programmes/innovation. Also, the success of the programme illustrates that there is the probability that programmes introduced via the marketplace has the tendency of reaching out to other institutions/organisations (family, office etc).

Thus, this study intends to explore the unique role and opportunities the marketplace presents in order to develop an effective waste management system for the urban marketplace with particular focus on waste generation and collection for the purpose of achieving a clean environment. The philosophy of the study is that, a waste management system that is effective at urban marketplaces could bring about a change in the attitude of people generally (in the society) since everyone in one way or the other participates in market life.
6. Research design

Please provide no more than 800 words and ensure that you discuss your sampling strategy (if appropriate), data collection methods and strategy for data analysis.
The research is organised into three phases as illustrated in Figure 1 (a more visible document of the research design is attached with this form).

Phase 1 is the literature review which focuses on three themes: provide an in-depth understanding of the urban marketplace; review current waste...
management practices in urban marketplaces; and identify stakeholders that influence waste management in urban marketplaces and evaluate the attitude of the stakeholders (the users of the facility) towards waste. A preliminary model of the urban marketplace has been developed based on data from literature. The requisite knowledge and understanding that is necessary to enable the formulation of questions for the primary data collection process were acquired and the case study criteria were established.

Phase 2 of the research is the primary data collection process in order to achieve the research objectives. This is the most important and critical phase of the study as it relies on primary data for the study and thus requires ethical approval. The data collection process for this phase is a combination of structured observation, face to face semi-structured interviews and questionnaires using open and closed ended questions.

The data collection process begins with structured observation after which the interviews and the administration of questionnaires will follow respectively. The structured observation and interviews will focus on 4 cases (of urban marketplaces) while the questionnaire will be administered to a single case from the existing case studies. The essence of initially using multiple cases is to collect data that will provide an in-depth understanding of the dynamics of the urban marketplace. Also, considering the fact that research on solid waste management in African urban marketplaces has not been given considerable attention (World Bank, 2009), it is important to adopt multiple cases in order to generate in-depth data.

Structured observation was adopted over the other types of observation as the researcher seeks to derive specific answers as to what and how things happen at the marketplace. For instance, the physical settings, the activities, the actors and events, the attitude of the people towards waste, etc. The researcher finds this method most suitable in collecting data that will aid in describing the urban marketplace and providing contemporary data on the dynamics of the urban marketplace thus providing data that will aid in achieving some of the objectives of the study.

The use of interviews will complement the data collected from the structured observation. The interviews will focus on two major themes: understanding the dynamics of the urban marketplace; and waste management practice in urban marketplaces. The interviews will be conducted after data from the structured observation has been collected. This will enable the researcher to incorporate questions/queries that evolved during the structured observation into the interview questions. The interviews will address a list of topics such as: whether or not the urban marketplace is influential in the Nigerian society, who are the urban marketplace stakeholders, what waste management strategy is used at urban marketplace, etc. Thus the researcher has opted for the use of semi-structured interviews. The potential interviewees are heads of urban marketplace association (past and present), persons in charge of the operation of urban markets at the local government level, NGO’s and organisations that have introduced their products or programmes through the marketplace, officials of the
Rivers State environmental sanitation authority, and waste management contractors.

The use of questionnaires for this study is for the purpose of addressing research question 5 and 6 (To what extent does the socio-cultural attitude of people in urban marketplaces affect waste management? and what are the factors that will stimulate a change in attitude towards waste in urban marketplaces?)

Based on the research questions (5 and 6), the researcher opted for a combination of both open and closed ended questions to give the respondents the opportunity to provide further comments on a response or on the options made available by the researcher. Based on the settings of the research area (the urban marketplace) and the focus of research question 5 and 6 (stakeholder’s that use the facility or generate waste as a result of the use of the facility), hand delivered questionnaires were most appropriate to collect data.

Phase 3 of the research is the use of focus group to test and validate the waste management strategy (focused on waste generation to collection phase) for the urban marketplace. The iterative research pattern which can be applied to numerous contexts and involves the continuous process of observing the application of the prototype, identifying the problem with the prototype, developing a solution and then testing the solution till the prototype is refined (Pratt, 2009) was adopted for this phase of the research.

**Sampling**

The probability and non-probability sampling technique will be adopted for the administration of questionnaire for this study. This is because the focus of objective 4 and 5 of the study is on stakeholders that use the urban marketplace (traders, visitors, buyers, etc.).

Objective 4 of the study is to critically evaluate the attitude of stakeholders (those that use the facility) with regards to waste in urban marketplaces and objective 5 is to determine factors that will bring about a change in attitude towards waste in urban marketplaces.

Apart from traders/stall owners that have a constant population, the other population (people that use this facility) varies and is not constant. It is thus impossible to adopt probability sampling for the whole population.

Thus, the researcher will rely on systematic sampling (probability sampling) for the traders/stall owners population while convenience sampling (non-probability sampling) is adopted for the other population as it is most suitable. The researcher will however collect data over a period of time (as regards convenience sampling) in order to have broad coverage and more opinion in order to address objective 4 and 5 of the study.
Data Analysis

Data collected through structured observation will be descriptively analysed creating themes and codes while data collected through interviews and questionnaires will be analysed using NVivo and SPSS software respectively. The researcher has opted for manual data analysis of structured observation data in order that the researcher is not detached from the data. However, there are no ethical concerns regarding the method of data analysis for this study.

7. Provide details of financial sponsorship and any ethical issues this may raise (50-150 words)

The Niger Delta Development Commission and the University of Brighton provides financial sponsorship (50% each) for my study in the form of scholarship. There are no ethical issues as regards the financial sponsorship and the research.

8. If the project involves funding from a Research Council or other organisation with an ethics policy (e.g. a charity) please confirm that the organisation’s ethical procedures have been considered and outline any actions taken.

Not Applicable

Please use the SET Research Ethics Checklist to decide which additional section(s) of this form to complete and complete appropriately

If you ticked yes to Question 1 in the checklist (Negative Environmental impacts) complete Section B

If you ticked yes to any of Questions 2-9 (Human Participant Issues) complete Section C

If you ticked yes to Question 10 (Indirect Involvement of the Public) complete Section D

If you ticked yes to Question 11 (Secondary Data Sources) complete Section E

The project student and the supervisor or the principal investigator in the case of staff research must sign the form in Section F
Section B - Potential Risk to the Environment

The aim of this section is to check whether you have taken the necessary steps to ensure your research will avoid causing significant negative impact on the environment.

9. If the research is likely to have significant negative impacts on the environment provide details of these impacts (for example the release of dangerous substances or damaging intrusions into protected habitats).

Not Applicable

10. Please describe how you will mitigate against significant environmental harm and manage risks.

Not Applicable

Section C - Potential Risk to Human Participants directly working with the researcher

The aim of this section is to check whether you have taken the necessary steps to ensure your research will avoid causing physical or emotional harm, pain, discomfort or stress to human participants.

11. If human participants are directly involved provide brief details regarding the participants and how they will be contacted (e.g. number, age, gender, ethnicity, general residential location).

The number of persons that will be contacted for the face to face interviews will be between 15–25 persons. Approximately 500 questionnaires will be administered and two sets of focus groups for each case study drawn from the urban marketplace stakeholders will be used to test and validate the model.

Participants for the face to face interviews and focus group will be contacted via mail and phone calls.

Participants for the study are not classified on whatsoever reason based on gender or ethnic background.

All participants will be over 18 years of age.

12. If human participants are directly involved provide details of any participants who might be considered vulnerable due to age or to a social, psychological or medical condition. Examples include children, people with learning disabilities or mental health problems but participants who may be vulnerable are not confined to these groups (see the University’s ‘Guidance on Good Practice in Research
Ethics and Governance’ for more details. Proposals involving such participants are often likely to require ethical approval from the Faculty of Science & Engineering Research Ethics and Governance Committee).

The success of the research does not depend on data from participants considered vulnerable or within groups termed vulnerable.

However, in the course of carrying out the research (while handing out consent forms), the researcher will ensure participants for the study are not in any way considered vulnerable or within groups termed vulnerable.

13. If human participants are directly involved provide details of any risks participants are likely to face that would not be considered minimal risks (see the University’s ‘Guidance on Good Practice in Research Ethics and Governance’ for details of possible risks including, but not limited to, physical risks to participants, distress arising from prolonged testing or questions of a sensitive nature, risks for researchers and risks for vulnerable people).

If risks are only minimal please describe the risks and explain why you believe they are only minimal.

There are no physical or mental risk associated with this study.

14. Describe the procedures that will be put in place to ensure safe and ethical direct involvement of human participants (Where necessary and as appropriate include comments where necessary on obtaining informed consent, reducing harm, providing feedback and accessing participants through an individual providing information such as a teacher, manager, employer etc.). Examples of consent and information forms can be found on StudentCentral.

Participants will be assured of confidentiality, thus pseudonyms will be used for participants, places made reference to in the course of collecting data and the research location. Although the research poses no known risks to participants, the essence of using pseudonyms for the research location is to ensure research participants cannot be identified via the location (having assured the participants of anonymity).

Identified participants will be handed consent forms and participant information sheet to be signed, confirming their consent to participate in the research.

Consent forms, cover letter and participant information sheets amongst other information will clearly state the purpose of the research and assure participants their participation is voluntary and can be withdrawn any time without giving reasons for withdrawal.

Although the researcher has access to participants, there might be circumstances in which the use of a stakeholder/group (for example the urban market association head/ urban market association) to solicit the involvement of
participants (for example the traders) will be necessary. This does not necessarily mean the success of the data collection process is anchored on a particular stakeholder.

The researcher will ensure reasonable safe distance during face to face interviews. Where possible, the researcher will sit at positions where there is easy access to the door.

On interview days (both face to face and focus group interviews), the researcher will inform a third party (most likely a family member) the venue of the interview and the duration of the interview. The researcher will also have an arrangement with the third party on what action(s) to take in the event that the researcher has not returned from the interview or has not contacted the third party within an agreed time.

Also, for the structured observation, a letter of identity and consent will be sought from the Local Government Authority and Urban Marketplace Association in order to manage cases of confrontation.

15. If covert or other controversial research methods are to be used or if the research procedures contravene conventional ethical protocols (including consent, confidentiality and feedback), justify the use of such methods and procedures here and outline the measures that will be put into place to mitigate against potential harm. If no controversial techniques will be used and the research will follow normal ethical protocols, please write ‘normal ethical protocols’ in the box below.

In providing an in-depth understanding of the urban marketplace, it is important to describe its physical setting and provide information on the events, activities, the actors, interaction etc. that occur at this space. Although interviews will be carried out with those in charge of urban marketplaces, the essence of using covert observation is to get a rich picture of the dynamics of the urban marketplace instead of depending solely on the respondents.

Being a public space and one in which interactions, events and activities are carried out openly, seeking informed consent from the participants is impossible as the marketplace is used by different people every other day.

However, the researcher has deemed it appropriate to inform the necessary authority in charge of the urban marketplace (Local government authority and the head of the urban market association) of the on-going research. The researcher will also ensure confidentiality at all times during the process.

The use of observation at this space is not intrusive and poses no known risks or harm to the participants or the researcher.

16. If human participants are to receive financial reimbursement for their time (excluding reasonable expenses to cover travel and other costs) provide details and a short justification (e.g. amounts and form of reimbursement).

Not Applicable
17. Describe in 50-100 words how you will ensure data collection is confidential and anonymous (e.g. interviews cannot be overheard, details will not be accessible to others), how data will be stored and who will have access to the data. If the data will not be confidential or anonymous outline the justification for this decision here and procedures for mitigating against potential harm. In particular, please outline consent and data protection procedures for the use of participants’ images if photographic or video recordings are to be made in the course of the research.

All data should be stored securely. Documentation should be kept in a locked cabinet or desk, and electronic data should preferably be kept on a removable disk or data stick which can be locked away, or if this is not possible on a password protected computer. (see the University's Guidance on Good Practice in Research Ethics and Governance for further details)

<table>
<thead>
<tr>
<th>Interviews (face-to-face and focus group) will be conducted behind closed doors. Where, interviews are to be conducted at locations chosen by the participant (e.g office), the interviewee will be reminded of the ethical concerns and the researcher will ensure the interview can be conducted behind closed doors.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus group participants will sign separate consent forms assuring confidentiality of information during focus group sessions and after the focus group has ended. The researcher will also encourage and remind the focus group participants of the importance of confidentiality before and after every meeting.</td>
</tr>
<tr>
<td>Participants contact details will be stored separately on a protected file from data collection instruments. Hard copies of data will be locked securely in a privately owned cabinet at the University while soft copies will saved in protected files on a password protected computer that is accessible only by the researcher. Also, fieldwork log containing all correspondences, date and time of activities will be kept and locked securely in a privately owned cabinet at the University.</td>
</tr>
<tr>
<td>Also, as regards the transportation of data (the study is carried out abroad) the researcher will transport all data in cabin luggage as oppose to checked in luggage. This way, the researcher is in control and aware of the position of the data.</td>
</tr>
<tr>
<td>Photographs to be taken for the study are of participants not directly involved in the study. However, photographs will be reviewed in such a way that the members of the public are not put in a compromising position. Also, photographs will be photoshopped to ensure the identities of the members of the public is hidden. The essence of the photograph is to enable the reader have a clearer context of the urban marketplace.</td>
</tr>
</tbody>
</table>
Section D - Potential risk to members of the public indirectly involved in the research without their knowledge at the time

The aim of this section is to check whether you have addressed any ethical issues arising from activities such as covert observation of people in non-public places and the use of methods that will affect privacy.

18. If the public are indirectly involved in the research without their knowledge at the time please provide brief details (e.g. how they will be involved and (where known) the age, gender, ethnicity and location of those who will be indirectly involved).

The study is being undertaken in a public space—the marketplace. The research intends to describe the physical setting, the events, behaviour and interaction that occur at the marketplace. Thus, in collecting data those that visit the urban marketplace are indirectly involved.

19. Provide details of any negative impacts members of the public will be likely to face and that would not be considered minimal impacts (e.g. invasion of privacy, harm to property, being subject to what an individual perceives to be inappropriate behaviour). If risks are only minimal please describe the risks and explain why you believe they are only minimal.

Not Applicable

20. Describe any procedures that will be put in place to ensure safe and ethical indirect involvement of members of the public (include comments where necessary on providing information and feedback if requested by the public). Examples of information forms can be found on StudentCentral.

The urban marketplace is a public facility/space that is visited by hundreds of persons daily. It is therefore impossible to seek informed consent of the individuals that use this facility/space. Also, this study poses no known risks either to the participants or the researcher. However, the researcher intends to seek the consent of the relevant authorities (in this case, the Local Government Authority and the head of the market Association) in charge of urban marketplaces.

21. If covert or other controversial research methods are to be used or if the research procedures contravene conventional ethical protocols (including consent, confidentiality and feedback), justify the use of such methods or procedures here and outline the measures that will be put into place to mitigate
against potential harm. If no controversial techniques will be used and the research will follow normal ethical protocols, please write ‘normal ethical protocols’ in the box below.

The use of observation as a primary data collection method has been adopted by various researchers in studying urban marketplaces in order to arrive at valid findings. Some of these researches includes: Watson and Studdert, 2006; Morales, 2009 and Skinner, 1964.

In providing an in-depth understanding of the urban marketplace for this study, it is important to describe its physical setting and provide information on the events, activities, the actors, interaction etc. that occur at this space. Although interviews will be carried out with those in charge of urban marketplaces, the essence of using covert observation is to get a rich picture of the dynamics of the urban marketplace instead of depending solely on the respondents.

Being a public space and one in which interactions, events and activities are carried out openly, seeking informed consent from the participants is impossible as the marketplace is used by different people every other day.

However, the researcher has deemed it appropriate to inform the necessary authority in charge of the urban marketplace (Local government authority and the head of the urban market association) of the on-going research.

The use of observation at this space is not intrusive and poses no known risks of harm to the participants or the researcher. The researcher will however ensure confidentiality of data at all times.

22. Describe in 50-100 words how you will ensure data collection is confidential and anonymous (e.g. people will not be able to be identified by photographs or notes taken by observers), how data will be stored and who will have access to the data. If the data will not be confidential or anonymous outline the justification for this decision here and procedures for mitigating against potential harm.

All data should be stored securely. Documentation should be kept in a locked cabinet or desk, and electronic data should preferably be kept on a removable disk or data stick which can be locked away, or if this is not possible on a password protected computer. For undergraduate projects normally only the student and supervisor will have access to the data (see the University’s ‘Guidance on Good Practice in Research Ethics and Governance’ for further details).

Pseudonyms will be used for people in the course of collecting data and the research location.

Hard copies of data will be locked securely in a privately owned cabinet at the University while soft copies will saved in memory stick and protected files on a password protected computer that is accessible only by the researcher.
Also, as regards the transportation of data (the study is carried out abroad) the researcher will transport all data in cabin luggage as oppose to checked in luggage. This way, the researcher is in control and aware of the position of the data.

However, photographs will be reviewed in such a way that the members of the public are not put in a compromising position. Also, photographs will be photoshopped to ensure the identities of the members of the public is hidden.

The essence of the photograph is to enable the reader have a clearer context of the urban marketplace.

Section E - Secondary Data

Secondary data refers to any data you plan to use that you will not collect yourself. Examples of sensitive secondary data include datasets held by organisations, patient records, confidential minutes of meetings, and personal diary entries (these are only examples and are not an exhaustive list).

23. Please provide details (50-100 words) regarding any secondary data to be used that may carry sensitive personal or sensitive organisational information.

Not Applicable

24. If secondary data sets containing sensitive personal or sensitive organisational information are to be used outline how such use will be ethically managed (include details such as anonymising data sets, ensuring protection of source agency, gaining consent of data owners, and how the data will be stored).

Not Applicable

Section F – Further Details, Accompanying Documentation and Signature

25. Please add anything relating to ethical issues that should be considered when assessing this project that has not been addressed elsewhere on this form. Continue on another sheet if necessary.

Not Applicable

26. Indicate which of the following are attached to this form.

The Research Ethics Checklist should be attached for all projects; you only need to provide the other documents if they are applicable to your project.

SET research Ethics Checklist (please remember to attach) - 1
Participant information sheet - 1

Participant consent form (or introduction to be used on questionnaire, see below) - 3

Research design - 1

Please note that projects that use questionnaires to be completed by respondents do not need a separate consent form, as consent is inferred if the questionnaire is completed; however, the opening statement on the questionnaire should indicate that this will be the case. All those completing a questionnaire should be offered an information sheet providing further details of the project and contact details of the University. When questionnaires are conducted by the researcher as part of an interview then a consent form should be signed.

27. Please sign this form.

Student / Principal researcher’s name: Adeni Abigo

Signed:

Date: 25/03/14

28. This form must be checked and approved by your supervisor (for MPhil / PhD students)

Any further Comments from supervisor:

Supervisor name: Dr. Kassim Gidado, Dr. Jon Gates and Dr. Paul Hanna
APPENDIX 3: Measures to Overcome Interview and Interviewee Bias

- The researcher’s level of knowledge about the context of the organisation or culture of the group within which the interviews will be conducted
- The level of information supplied by the researcher to each interviewee
- The appropriateness of interview location(s)
- The appropriateness of the researcher’s appearance
- The nature of the researcher’s opening comments
- The researcher’s approach to questioning
- Appropriate use of open, probing, specific and closed questions, and avoidance of leading questions
- The impact of the researcher’s behaviour during the interview(s)
- The ability of the researcher to demonstrate attentive listening skills
- The researcher’s scope to summarise and test the researcher’s own understanding
- The ability of the researcher to recognise and deal with difficult participants (where necessary)
- The researcher’s ability to record data accurately and fully
APPENDIX 4: Interview Guide

Group A – Buyers and Visitors

Aim of interview: To understand the dynamics of the urban marketplace and to determine current waste management practices in urban marketplaces

Prospective interviewees: Buyers and Visitors

Part 1

1. In your own words/terms, please describe the components and sub-components that make up a typical urban marketplace. (These are the various features of a typical urban market. Example of a component is the people and sub-components of people include the buyers, sellers, etc).

2. The Rivers State Government recently commenced the remodelling of urban marketplaces with the rationale of providing spacious marketplaces with modern and basic facilities and systems (such as fire station, waste area, water, etc) that will enhance market life.
   a. Could you explain if the expectations of the remodelling are being met?
   b. Do you think the remodelling of urban marketplaces has had an impact as to how the urban marketplace operates?

Part 2

1. Who would you describe as stakeholders of urban marketplace and why?
   a. Apart from trade related transactions, have you had discussions with any of the stakeholders regarding other issues or are you aware of persons that discuss other issues apart from trade related issues?
   b. Do you think your attitude can be influenced by any of the stakeholders? How/why depending on response.
   c. Do you think you can influence the attitude of any of the stakeholders? (How/why not – depending on response, giving examples where necessary).

2. The African marketplace is a focal point of the society. Various programmes aimed at reaching out to the public are disseminated via the marketplace. Do you think the marketplace environment can influence your attitude? How/why not (depending on response).

3. Using examples, do you think events and activities at the marketplace might have an influence on your attitude/behaviour outside the marketplace (e.g. at home)?
4. Every business environment is affected by external factors/forces which may influence the activities of the business. Being a business environment, what are the challenges or factors that occur outside the urban marketplace that has an influence/impact on urban marketplace activities?
  a. How does the mentioned factor(s) have an influence on urban marketplace activities?

**Part 3**

1. In terms of waste management in urban marketplaces, who would you describe as the stakeholders?

2. How do you handle the waste you generate at the marketplace?
   a. What is (are) your reason(s) for handling waste in the said manner?

3. How do you handle the waste you generate at home or at your workplace?
   a. What is (are) your reason(s) for handling waste in the said manner?

4. In your opinion, how do you describe the attitude of the various urban marketplace stakeholders (such as the buyers and visitors, traders, waste contractors and waste management regulators) towards waste?

5. In your opinion, has the remodelling of the urban marketplace had an effect on waste management (generation, storage, collection and disposal) or the general cleanliness of the marketplace? Please state how.

6. In order to achieve a clean environment at urban marketplaces, what aspect(s) of the current waste management practice needs to be improved on?
Group B - Traders

Aim of interview: To understand the dynamics of the urban marketplace and to determine current waste management practices in urban marketplaces

Prospective interviewees: Traders

Part 1

1. In your own words/terms, please describe the components that make up a typical urban marketplace.

2. The Rivers State Government recently commenced the remodelling of urban marketplaces with the rationale of providing spacious marketplaces with modern and basic facilities and systems (such as fire station, waste area, water, etc) that will enhance market life.
   a. Could you explain if the expectations of the remodelling are being met?
   b. Do you think the remodelling of urban marketplaces has had an impact as to how the urban marketplace operates?

Part 2

1. Who would you describe as stakeholders of urban marketplace and why?
   a. Apart from trade related transactions, have you had discussions with any of the stakeholders regarding other issues or are you aware of persons that discuss other issues apart from trade related issues?
   b. Do you think your attitude can be influenced by any of the stakeholders? How/why depending on response.
   c. Do you think you can influence the attitude of any of the stakeholders? (How/why not – depending on response, giving examples where necessary).

3. The African marketplace is a focal point of the society. Various programmes aimed at reaching out to the public are disseminated via the marketplace. Do you think the marketplace environment can influence your attitude? How/why (depending on response).

4. Using examples, do you think events and activities at the marketplace might have an influence on your attitude/behaviour outside the marketplace (e.g at home)?
5. Every business environment is affected by external factors/forces which may influence the activities of the business. Being a business environment, what are the challenges or factors that occur outside the urban marketplace that has an influence/impact on urban marketplace activities?
   a. How does the mentioned factor(s) have an influence on urban marketplace activities?

Part 3

1. In terms of waste management in urban marketplaces, who would you describe as the stakeholders?

2. How do you handle the waste you generate at the marketplace?
   a. What is (are) your reason(s) for handling waste in the said manner?
   b. Are you aware of the practice of sorting out waste or do you sort out waste for the purpose of reuse, recycling or for any other purpose? Please list and describe what use the waste is put into.

3. How do you handle the waste you generate at home or at your workplace?
   a. What is (are) your reason(s) for handling waste in the said manner?

4. In your opinion, how do you describe the attitude of the various urban marketplace stakeholders (such as the buyers and visitors, traders, waste contractors and waste management regulators) towards waste?

5. In your opinion, has the remodelling of the urban marketplace had an effect on waste management (generation, storage, collection and disposal) or the general cleanliness of the marketplace? Please state how.

6. In order to achieve a clean environment at urban marketplaces, what aspect(s) of the current waste management practice needs to be improved on?
Group C - Regulators

**Aim of interview**: To understand the dynamics of the urban marketplace and to establish current waste management practices in urban marketplaces

**Potential Interviewees**: Key officers of urban market association, Officers of Local Government Authority, senior officers of Rivers State Environmental Sanitation Authority

**Part 1**

1. In your own words/terms, please describe the components that make up a typical urban marketplace.

2. The Rivers State Government recently commenced the remodelling of urban marketplaces with the rationale of providing spacious marketplaces with modern and basic facilities and systems (such as fire station, waste area, water, etc) that will enhance market life.
   a. Could you explain if the expectations of the remodelling are being met?
   b. Do you think the remodelling of urban marketplaces has had an impact as to how the urban marketplace operates?
   c. Were you involved in any consultation as regards the remodelling of the urban marketplace?

**Part 2**

3. Who would you describe as stakeholders of urban marketplace and why?
   a. Apart from trade related transactions, have you had discussions with any of the stakeholders regarding other issues or are you aware of persons that discuss other issues apart from trade related issues?
   b. Do you think your attitude can be influenced by any of the stakeholders? How/why depending on response.
   c. Do you think you can influence the attitude of any of the stakeholders? (How/why not – depending on response, giving examples where necessary).

4. The African marketplace is a focal point of the society. Various programmes aimed at reaching out to the public are disseminated via the marketplace. Do you think the marketplace environment can influence the attitude of those that use the space? How/why (depending on response).
5. Using examples, do you think events and activities at the marketplace might have an influence on your attitude/behaviour outside the marketplace (e.g. at home)?

6. Every business environment is affected by external factors/forces which may influence the activities of the business. Being a business environment, what are the challenges or factors that occur outside the urban marketplace that has an influence/impact on urban marketplace activities?
   a. How does the mentioned factor(s) have an influence on urban marketplace activities?

   **Part 3**

1. In terms of waste management in urban marketplaces, who would you describe as the stakeholders?

2. Is there a waste management strategy for the urban marketplace?
   a. How is it implemented?
   b. How is the waste management strategy monitored?
   c. Who is responsible (in terms of payments) for waste management services at urban marketplaces?
   d. Are there penalties for defaulters in the case of waste handlers and users of the marketplace?
   e. How successful is the waste management strategy? How can it be improved?

3. How would you describe current waste management practices in urban marketplaces?

4. What are the major challenges of effective waste management practice at urban marketplaces?

5. How would you describe the attitude of the stakeholders such as the buyers and visitors, traders and waste handlers towards waste?

6. In your opinion, has the remodelling of the urban marketplace had an effect on waste management (generation, storage, collection and disposal) or the general cleanliness of the marketplace? Please state how.
Group D – Waste Handlers

Aim of Interview: To determine waste management strategy in Urban Marketplaces

Prospective Interviewee: Waste handlers

Part 1

1. In your own words/terms, please describe the components that make up a typical urban marketplace.

2. The Rivers State Government recently commenced the remodelling of urban marketplaces with the rationale of providing spacious marketplaces with modern and basic facilities and systems (such as fire station, waste area, water, etc) that will enhance market life.

   a. Could you explain if the expectations of the remodelling are being met with particular reference to your role at urban marketplaces?
   
   b. Do you think the remodelling of urban marketplaces has had an impact as to how the urban marketplace operates?

Part 2

1. Who would you describe as stakeholders of urban marketplace and why?

2. Apart from trade related transactions, have you had discussions with any of the stakeholders regarding other issues or are you aware of persons that discuss other issues apart from trade related issues?

3. Do you think your attitude can be influenced by any of the stakeholders? How/why depending on response.

4. Do you think you can influence the attitude of any of the stakeholders? (How/why not – depending on response, giving examples where necessary).

5. The African marketplace is a focal point of the society. Various programmes aimed at reaching out to the public are disseminated via the marketplace. Do you think the marketplace environment can influence the attitude of those that use the space? How/why (depending on response).

6. Using examples, do you think events and activities at the marketplace might have an influence on your attitude/behaviour outside the marketplace (e.g. at home)?
7. Every business environment is affected by external factors/forces which may influence the activities of the business. Being a business environment, what are the challenges or factors that occur outside the urban marketplace that has an influence/impact on urban marketplace activities?

a. How does the mentioned factor(s) have an influence on urban marketplace activities?

Part 3

1. Who would you describe as stakeholders regarding waste management at urban marketplaces?

2. Please describe your organisation’s waste management strategy?

3. Please describe your waste collection strategy for the urban marketplace?

4. Do you consult with the direct stakeholders before designing a waste collection strategy? If yes, how is that done? If no, why not?

5. How do you measure whether or not your current waste collection strategy for the urban marketplace is effective? Are there areas that need to be improved on?

6. What are the waste management challenges encountered in urban marketplaces?

7. How would you describe the attitude of the stakeholders such as the buyers, traders, visitors and waste regulators towards waste?

8. In your opinion, has the remodelling of the urban marketplace had an effect on waste management (generation, storage, collection and disposal) or the general cleanliness of the marketplace? Please state how.
Group E – Sensitisation Group

Aim of Interview: To Understand the motive behind organisations introducing/disseminating information, programmes and innovation via the Urban Marketplace.

Prospective Interviewee: Churches, NGO’s, political parties and marketing companies.

Part 1

1. In your own words/terms, please describe the components that make up a typical urban marketplace.

2. The Rivers State Government recently commenced the remodelling of urban marketplaces with the rationale of providing spacious marketplaces with modern and basic facilities and systems (such as fire station, waste area, water, etc) that will enhance market life.
   a. Could you explain if the expectations of the remodelling are being met?
   b. Do you think the remodelling of urban marketplaces has had an impact as to how the urban marketplace operates?

Part 2

1. How often do you use the urban marketplace to introduce your products/programmes?
   a. Could you please give examples of programmes/products you have introduced at the urban marketplace?

2. Why do you consider the urban marketplace as an avenue to introduce your products/programmes or disseminate information?
   a. In your opinion, do you think the urban marketplace is a medium to change behaviour? Please give reasons

3. How do you gain access to the users of the urban marketplace?

4. What strategy, tool(s) or technique do you use in introducing your products or programmes to the market users?
   a. Why do you use the said strategy/tool/technique?

5. How do you measure whether or not the programme was successful?

6. What is your view on the physical settings of the urban marketplace in relation to ease of information dissemination? or With what ease can information be disseminated at urban marketplaces?
APPENDIX 5: Questionnaire Survey on Municipal Solid Waste Management Practices in Marketplaces

Aim of questionnaire: To determine the relative importance of the factors (identified via qualitative data sets - Interviews with stakeholders) that could enhance solid waste management practices of market users.

1. Which of the following categories best describes your role/presence in the marketplace environment?
   - ☐ Buyer/Visitor
   - ☐ Trader (with shop/shed)
   - ☐ Trader (by the fence)
   - ☐ Hawker
   - ☐ MPE Regulator (Traders’ Association Executive, LG Superintendent, RSESA Personnel)
   - ☐ Waste Handler
   - Other (please specify)


2. In your opinion, how would you rate the importance of the following factors in enhancing solid waste management practices in marketplaces?

<table>
<thead>
<tr>
<th>Factor</th>
<th>Slightly Important</th>
<th>Moderately Important</th>
<th>Indifferent</th>
<th>Very Important</th>
<th>Extremely Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate market infrastructure</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Sensitisation and orientation</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Collection of waste at appropriate time</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Improved frequency in waste collection</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Daily clean up by traders and market sanitation</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Monitoring and supervision of waste management practices</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Imposition of fines</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Employment of market cleaners</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Use of signage</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Provision of waste management office (waste experts) within marketplaces</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

Other (please specify)
3. In your opinion, how would you rate the effect of the following factors on the attitudes of market users toward waste?

<table>
<thead>
<tr>
<th>Factor</th>
<th>Extremely Low</th>
<th>Very Low</th>
<th>No Effect</th>
<th>Very High</th>
<th>Extremely High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate market infrastructure</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Sensitisation and orientation</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Collection of waste at appropriate time</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<td>○</td>
</tr>
<tr>
<td>Improved frequency in waste collection</td>
<td>○</td>
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<td>○</td>
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<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
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<td>○</td>
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<tr>
<td>Employment of market cleaners</td>
<td>○</td>
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</tr>
<tr>
<td>Use of signage</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Provision of waste management office (waste experts) within marketplaces</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

3. Please, provide any other factor that you think would influence the attitude of market users toward waste in urban marketplaces...
APPENDIX 6: Focus Group Discussion and Exercise Schedule

Prospective group members:

- 2 traders (one each from the old and new markets)
- 2 Buyers/Visitors
- 2 MPE Association members (one each from the old and new markets)
- 2 representative of waste handlers
- 1 representative of Rivers State Environmental Sanitation Authority
- 2 representative from Local Government Council

*The focus group session is estimated to last approximately 2 hours.*

Part 1

The session will begin with:

- Welcome (by the researcher) – This will include greetings and introduction,
- Overview of the aim of the focus group – This will also include justifying why the participants were selected,
- Ground rules/guidelines for the meeting (Including clarification on consent form and participants’ information sheets).

(10 Minutes)

Definition of terms:

- Urban marketplace environment (MPE)
- Facilities Management
- Waste management

(5 Minutes)
Part 2

**Aim:** To establish the effect of the factors that could enhance solid waste management practices of market users.

1. Introduction and description of the factors that could enhance waste management practices in MPEs;

   A. Appropriate market infrastructure
   
   B. Sensitisation & orientation
   
   C. Collection of waste at appropriate time
   
   D. Improved frequency in collection times
   
   E. Daily clean-up & market sanitation
   
   F. Monitoring & supervision of waste management practices
   
   G. Imposition of fines
   
   H. Employment of market cleaners
   
   J. Use of signage
   
   K. Provision of waste management office (waste experts) within marketplaces

   *(15 Minutes)*

   a. Are there other factors (not listed) that could enhance waste management practices in marketplaces?

   *(5 Minutes)*
Part 3

1. Request the participants to (collectively) rate the effect of the factors in enhancing solid waste management practices in MPEs. *(15 Minutes)*

How would you rate the effect of the following factors on the attitudes of market users toward waste?

<table>
<thead>
<tr>
<th>Factor</th>
<th>Extremely Low</th>
<th>Very Low</th>
<th>No Effect</th>
<th>Very High</th>
<th>Extremely High</th>
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<tbody>
<tr>
<td>Appropriate market infrastructure</td>
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<td>Sensitisation and orientation</td>
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<td>Collection of waste at appropriate time</td>
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<td>Daily clean up by traders and market sanitation</td>
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<td>Monitoring and supervision of waste management practices</td>
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<td>Imposition of fines</td>
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<td>Employment of market cleaners</td>
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<td>Use of signage</td>
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<td>Provision of waste management office (waste experts) within marketplaces</td>
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Break *(15 Minutes)*
Part 4: To establish the relationship of the factors that could enhance solid waste management practices of market users.

1. On a scale of 1 – 5 (1 - Very low, 2 - Low, 3 - No effect, 4 - High, 5 - Very high) how would you rate the influence of individual factors on another? For example, how factor A influences factors B<sub>1</sub> – K<sub>1</sub>. 

(40 Minutes)

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<tr>
<td>A. Appropriate market infrastructure</td>
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<td>B. Sensitisation &amp; orientation</td>
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<td>C. Collection of waste at appropriate time</td>
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<td>D. Improved frequency in collection times</td>
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<td>E. Daily clean-up &amp; market sanitation</td>
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<td>F. Monitoring &amp; supervision of waste management practices</td>
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<td>G. Imposition of fines</td>
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<td>H. Employment of market cleaners</td>
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<td>J. Use of signage</td>
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<td>K. Provision of waste management office</td>
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Appendix 7: Screen Prints of Data Analysis with QSR NVivo 10
Example of themes (nodes)
APPENDIX 8: Consent Forms, Questionnaire cover letter, and Participant Information Sheet

CONSENT FORM: Interviews

Title of Project: The impact of Urban Marketplaces on Effective Municipal Solid Waste Management Systems in Nigeria.
Name of Researcher: Miss Adeni Abigo
Contact details
Telephone: +44 (0) 1273 642203  Email: A.Adeni@brighton.ac.uk

I ______________________________________________________ agree to be involved in this research which focuses on the role and influence of the urban marketplace on better waste management practices in Nigeria. I give my permission for Miss Adeni Abigo to use excerpts from the face to face interview for this study. Miss Adeni Abigo has explained to my satisfaction the purpose of the study. I have been informed of the nature and purposes of the study and have read the information sheet. I understand the principles and processes of the study.

I am aware that I will be asked to respond to interview questions related to the study only and interviews will take between 30 minutes and 1 hour.

I understand that my personal details (including my contact details) will remain confidential. Data will be stored in a secure area and destroyed after a maximum period of ten years after the study. I understand that relevant (anonymous) sections of any data collected during the study may be looked at by the supervisors of this research project – Dr. Kassim Gidado, Dr. Jon Gates and Dr. Paul Hanna, for teaching and research purposes only.

I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my rights being affected and my actions (withdrawal) shall have no effect whatsoever on my reputation or future endeavours.

I understand that the data collected will be used as part of a PhD project. I understand that the data will be used in writing up the thesis (which will be held in the School of Environment & Technology, University of Brighton, UK) and disseminating the findings in other research publications and activities. I understand that only anonymous excerpts from the research will be used in thesis write ups.

I agree to take part in the above study.

__________________          ______________     __________________
Name of Participant  Date  Signature

_____________________ ______________  ____________________
Name of Person taking consent  Date  Signature

_______________________ ________________    _________________
Researcher   Date  Signature

CONSENT FORM: Focus Group Discussions
Title of Project: The impact of Urban Marketplaces on Effective Municipal Solid Waste Management Systems in Nigeria.

Name of Researcher: Miss Adeni Abigo

Contact details - Telephone: +44 (0) 1273 642203   Email: A.Adeni@brighton.ac.uk

I ____________________________________ agree to be involved in this research which focuses on the role and influence of urban marketplaces on better waste management practices in Nigeria. I give my permission for Miss Adeni Abigo to use excerpts from focus group interviews for this study.

Miss Adeni Abigo has explained to my satisfaction the purpose of the study. I have been informed of the nature and purposes of the study and have read the information sheet. I understand the principles and processes of the study.

I am aware that I will be asked to respond to questions related to the study only and focus group discussions will take between 2 hours and 3 hours. I understand that I am not to share information discussed during focus group sessions with third parties during and/or at the end of focus group sessions.

I understand that my personal details (including my contact details) will remain confidential. Data will be stored in a secure area and destroyed after a maximum period of ten years after the study. I understand that relevant (anonymous) sections of any data collected during the study may be looked at by the supervisors of this research project – Dr. Kassim Gidado, Dr. Paul Gilchrist, for teaching and research purposes only.

I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my rights being affected and my actions (withdrawal) shall have no effect whatsoever on my reputation or future endeavours.

I understand that the data collected will be used as part of a PhD project. I understand that the data will be used in writing up the thesis (which will be held in the School of Environment & Technology, University of Brighton, UK) and disseminating the findings in other research publications and activities. I understand that only anonymous excerpts from the research will be used in thesis write ups.

I agree to take part in the above study.

_________________________________________   ______________________   ______________________
Name of Participant                          Date                                     Signature

_________________________________________   ______________________   ______________________
Name of Person taking consent               Date                                     Signature
(If different from researcher)

_________________________________________   ______________________   ______________________
Researcher                                   Date                                     Signature
Dear Sir/Madam,

INVITATION TO PARTAKE IN QUESTIONNAIRE SURVEY FOR PhD RESEARCH.

RESEARCH TITLE: THE IMPACT OF URBAN MARKETPLACES ON EFFECTIVE MUNICIPAL SOLID WASTE MANAGEMENT SYSTEMS IN NIGERIA.

I am currently undertaking a study that focuses on the role and influence of urban marketplaces on better waste management practices in Nigeria. The aim of the research is to provide an in-depth understanding of the influence of urban marketplaces in Nigeria on people’s attitude towards waste in order to effect better waste management practices at urban centres.

I kindly request your assistance in providing data for the study by filling the attached questionnaire. This will take approximately 10 – 15 minutes of your time.

Please note that your participation is voluntary and you are free to withdraw at any time without giving any reason and your actions (withdrawal) will not affect your reputation or future endeavours.

By filling out the attached questionnaire, you are giving your consent that data provided can be used as a part of the study.

I guarantee that all information provided for the study will be treated as confidential.

Many thanks for your time and consent.

Yours faithfully,

Adeni Abigo
A.Adeni@brighton.ac.uk
+44 (0) 1273 642203
School of Environment and Technology
University of Brighton
Brighton, United Kingdom.
BN2 4GJ.
PARTICIPANT INFORMATION SHEET

Study Title: The impact of Urban Marketplaces on Effective Municipal Solid Waste Management Systems in Nigeria.

Dear Sir/Madam,

You are being invited to take part in a research study by assisting in providing data for the study. It is important that before you decide to take part in this study you have a clear understanding of the study, the purpose of the study and what is expected of you.

Kindly read through the following information below and feel free to make further inquiries with me – Adeni Abigo where you are not clear or if you need further information.

You can talk to others about the study if you wish and please take time in deciding as to whether or not you want to take part in the study.

Thank you.

What is the purpose of the study?

Various studies affirm that municipal solid waste management is one of the greatest challenges facing all tiers of government and stakeholders in Nigeria. This is worsened by the alarming growing rate of urban population coupled with the unavailability of the necessary infrastructure and the lack of effective waste management systems.

This study focuses on the African urban marketplace environment (MPE) as a facility, chosen due to its cultural significance within the African setting and its effect on the behaviour of the society in which it exists. The aim of the research is to provide an in-depth understanding of the influence of MPE on the attitude of people towards waste. The outcome of the study is a model that integrates attitudinal change factors that could enable the enhancement of solid waste management in MPE.

Why have I been chosen?

Participants for this study are drawn from urban marketplace stakeholders and waste management stakeholders in Port Harcourt. These include Port Harcourt City Local Government Authority, Rivers State Ministry of Environment, Rivers State Sanitation...
Authority, past and present heads of urban marketplace association, traders, buyers and
visitors in urban marketplaces, waste handlers, organisations that introduce their
products/programmes via the urban marketplace.

The essence of choosing participants out of these groups is because primary data for this
research is dependent on their participation in the study.

Do I have to take part?

No, you do not have to take part. Participation is voluntary and you are free to withdraw at
any time during the study without giving reasons. A decision not to take part or a decision to
withdraw will have no effect on your rights and shall have no effect whatsoever on your
reputation or future endeavours.

However, if you decide to take part, you will be given this information sheet to keep and
asked to sign a consent form.

What will happen to me if I take part?

This study relies on primary data from direct human participation via face to face interviews,
questionnaires and focus group discussions.

Participants for the face to face interview will be involved in only one interview session that
will last between 30 minutes and 1 hour. During the interview, participants will be asked
questions related to the research area only. Interviews will be audio-taped and conducted
behind closed doors in order to maintain confidentiality. Your identity, places or persons
referred to in the course of the interview will be kept anonymous.

Participants to take part in filling questionnaires will fill out only one questionnaire for the
study. The filling of questionnaires will take between 10–15 minutes. Questions are related
to the study alone and participants’ identity is kept anonymous.

Participants for focus group sessions will be involved in only one focus group session that
will last between 2 hours and 3 hours. During the focus group session, participants will be
asked questions related to the research area only. Focus group sessions will be held in
conference room/hall at the office of the urban marketplace association. The time and date
will be communicated to the participants in good time. However, if for whatsoever reason(s)
there is a change as to the venue, the new venue will be communicated to the participants.
Focus group sessions will be audio-taped and conducted behind closed doors in order to maintain confidentiality. Your identity, places or persons referred to in the course of the session will be kept anonymous. However, you are advised to use pseudonyms (stage names) while making reference to persons or places in the course of the session. Also, focus group participants are bound by signed consent forms assuring confidentiality of information during focus group sessions and after the focus group session has ended.

Soft copies of data will be saved in protected files on password protected personal computer and hard copies will be locked securely in personal cabinet at the University of Brighton.

**Expenses and payments:**

Kindly note that payments will not be made for your assistance in providing data that will support this study.

**What do I have to do?**

Participants are expected to give responses to interview questions (face to face and focus group discussions) and fill out questionnaires related to the study.

Where interviews are to be conducted in spaces provided by the participant, the participant is expected to ensure the interview can be conducted in a safe environment and behind closed doors in order to ensure confidentiality.

It is important that participants that partake in focus group sessions maintain confidentiality of information by not discussing details of the sessions with third parties during and after focus group sessions.

**What are the possible disadvantages and risks of taking part?**

There are no risks, discomfort or inconvenience associated with this study.

**What are the possible benefits of taking part?**

There are no immediate benefits of taking part in the study.

However data provided will support the study in arriving at effective waste management practices for urban marketplaces in Nigeria which can be adopted by the necessary authority for implementation.
What will happen if I don’t want to carry on with the study?

As earlier stated, you have the right to withdraw at any time during the study without giving reasons. A decision to withdraw will have no effect on your rights and shall have no effect whatsoever on your reputation or future endeavours.

**Will my taking part in this study be kept confidential?**

Yes. Face to face interviews and focus group discussions will be conducted behind closed doors in order to maintain confidentiality. The identity of the participant, places or persons referred to in the course of the interview will be kept anonymous. Also, the identity of the participants who take part in filling questionnaires will be kept anonymous.

Soft copies of data will be saved in protected files on password protected personal computer and hard copies will be locked securely in personal cabinet at the University of Brighton and data will be destroyed after a maximum period of ten years after the study is concluded.

Data collected will be used as part of a thesis in writing up and disseminating this study. Also a copy of the thesis will be held in the School of Environment & Technology at the University of Brighton.

Data collected during the study may be looked at by the supervisors of this thesis – Dr. Kassim Gidado, and Dr. Paul Gilchrist, for teaching and research purposes.

What will happen to the results of the research study?

The results of the study will be published. If this is the case, participants will remain anonymous.

However, a summary of the result will be made available to participants interested in the outcome of the study.

Kindly fill out your email address below if you are interested in the outcome of the study:

Email: ………………………………………………………………...
What if there is a problem?

Concerns/complaints regarding the study may be directed to any of the contacts listed below:

**Dr. Kassim Gidado**  
School of Environment & Technology,  
University of Brighton.  
+44 (0) 1273 643889

**Dr. Paul Gilchrist**  
School of Environment & Technology,  
University of Brighton.  
+44 (0) 1273 642394

**School of Environment and technology**  
University of Brighton.  
+44 (0) 1273 642288

**Contact Details:**  
Kindly use the contact details below for further information about the study:  
Email address: A.Adeni@brighton.ac.uk