

**Household Attitudes to Solid Waste Management in
Developing Country Cities:
A Case Study of Lagos, Nigeria**

By

Adebisi Oluseun Araba

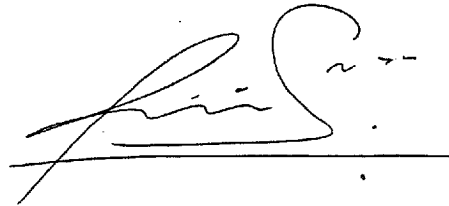
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2010

I, Adebisi Oluseun Araba, confirm that the work presented in this PhD thesis is my own original work.

Signature: Adebisi Oluseun Araba

A handwritten signature in black ink, appearing to read 'A. Araba', written over a horizontal line.

Date: 24, September, 2010

Supervisors:

Prof. J.N.B. Bell

Centre for Environmental Policy

Imperial College London

South Kensington

SW7 2AZ

Prof. D.C. Wilson

Department of Civil & Environmental

Engineering

Imperial College London

South Kensington

SW7 2AZ

ABSTRACT

A history of failures within the solid waste management system in developing country cities indicates that previous interventions which have focused mainly on technical and / or legislative aspects may be ineffective and therefore suggests the need for a new holistic approach to waste policy formulation and implementation.

Growing evidence exists in both developed and developing countries in support of the inclusion of all key stakeholders in the entire process of waste policy formulation and implementation to promote sustainability. In this vein, a framework for integrating social evidence, in the form of household attitudes, into waste management policy in developing country cities, has been developed using Lagos, Nigeria as a case study area and the results of this process are presented in this thesis.

A baseline of prevailing attitudes of householders towards waste management issues has been acquired through quantitative and qualitative investigation techniques and this has been examined to highlight the factors which influence household waste management behaviour.

Current waste management policies in Lagos have been examined, in light of the acquired evidence, to investigate their efficacy. The results show that householders in Lagos face mostly practical barriers which preventing them from behaving in pro-environmental ways and these barriers are not reflected in the current environmental policies.

A model framework, showing the flow of waste and resources, has been developed and used to highlight the potential impact that current waste management policies will have on household waste disposal methods as well as the potential of stakeholders to extract valuable resources from the waste stream before final disposal. This model has then been used, in association with the acquired evidence, to suggest a new, integrated waste management system that minimises illegal disposal of waste and maximises resource extraction. Finally, policy suggestions, also based on the social evidence acquired, have been made to support the implementation and sustainability of the integrated system.

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A special remembrance for my late colleague, Charlotte Rich (August 14, 2007). Your lively, funny, friendly person remains in my thoughts.

*To the GLORY of God and to the unconditional love of
Adébáyò and Adébólánlé Olúbùnmi*

FOREWORD

A thesis provides an answer to a unique question. It establishes an academically rigorous procedure in the course of providing this answer and therein lies its strength.

This thesis originally intended to answer a simple question: 'What is the best way to manage disused 'pure water' sachets?' which are discarded on streets and constitute environmental hazards in Lagos through clogging drains and natural waterways, leading to flooding in most parts of the State.

As the research developed, it became necessary to expand the scope of the original question and in doing so, assess the possibility that the 'pure water' sachet in itself did not constitute an immediate environmental hazard. The issue, it seemed, stemmed from their inappropriate disposal by people. Therefore, a new question was formulated 'Why do people in Lagos dump waste (which was eventually expanded to include all household wastes) illegally?' This new line of thought, focusing on the nexus between waste management policy and householder behaviour, evolved the research from what was initially intended as an investigation in environmental engineering into one more firmly rooted within the realms of environmental policy and behaviour.

The chapters contained in this thesis reflect the outcome of investigations based on the evolved research question.

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'The longer I live, the more I realize the impact of attitude on life.

Attitude, to me, is more important than facts. It is more important than the past, than education, than money, than circumstances, than failures, than successes, than what other people think or say or do. It is more important than appearance, giftedness, or skill. It will make or break a company ... a church ... a home.

The remarkable thing is we have a choice every day regarding the attitude we will embrace for that day. We cannot change our past. We cannot change the fact that people will act in a certain way. We cannot change the inevitable.

The only thing we can do is play on the one string we have, and that is our attitude ... I am convinced that life is 10% what happens to me, and 90% how I react to it. And so it is with you ... we are in charge of our Attitudes.'

Attitude - Charles R. Swindoll

CHAPTER 1. INTRODUCTION

The inefficiencies that manifest through mankind's quest to convert resources from one form or use to another leads to the generation of a by-product, a form of *entropy*, which is deemed as being no longer usefully available to its producer (Georgescu-Roegen, 1976). This *valueless* resource, as will be shown later in this chapter, is a function of time, space and culture and has proven to be one of the greatest challenges to human development in the 21st century. This product is generically termed *waste*. Waste, in the context of this research, except where expressly stated, refers to solid waste arising from households, which is the subject of this study.

There are many types of waste – with the focus of this study on solid wastes, as opposed to waste water and sewage. More specifically, our focus is on the management of solid wastes from household sources and the interplay between household attitudes towards waste management issues and waste management policy in Developing Country cities.

1.1 Dimensions of waste

Solid waste from household sources varies in composition and value over time and space. For example, what may be considered waste to some people (used plastic bottles) may be regarded as a resource by others (empty bottles for reuse) or valuable material (for sale) to recycling industries. Various other incidental influences mould and guide what values are placed on waste. These are discussed below.

There are many factors which may contribute to the variation of waste in its composition over time. These factors include the seasonality of waste fractions, where certain types of waste are generated in above-average quantities over a short period (for example, packaging waste during festive periods and local food produce during harvest season). The seasonal change in waste composition is rapid and lasts over a relatively short period. Longer term waste composition changes exist in the form of a steady and sometimes stealthy increase in percentage of certain waste fractions (for example plastic fractions), over longer periods from a few years to several decades. These evolutionary changes may

be explained by the impact of factors ranging from lifestyle changes to technological innovations influenced by industrialisation and development. The waste may vary in composition seasonally, for example in Lagos between the rainy seasons (April – July and October – November) and the dry seasons (August – September and from December – March) there is a marked variation in the composition and density of wastes (Egunjobi, 1986). This is largely explained by the impact of moisture content on waste fractions, with more wet, dense material during the rainy seasons and less dense, drier material during the dry seasons.

Little historical data on waste composition exists to validate the variation of waste over time. However, an appraisal of certain cultural practices shows a marked trend. For example, in West Africa, the wrapping of retailed foodstuff and condiments in plant leaves from points of purchase was the predominant practice until the mid twentieth century. Recently however, more products have incorporated the use of plastics, paper and metal packaging at the expense of the natural, organic leaves and so the shift has been from a near total biodegradable (packaging) waste composition to a steady increase in paper, plastics and metal (packaging) fractions. A more recent demonstration of this variation can be taken from previous studies that have shown a steady increase in the proportion of putrescible fractions of household solid waste in Lagos from about 60% in 1982 (Cointreau, 1982), to about 68% in 2002 (Oyelola and Babatunde, 2008). Plastics have increased from less than 1% in 1982 (Cointreau, 1982) to over 11% in 2002 (Oyelola and Babatunde, 2008). These changes may have serious implications for the type of waste management storage, collection and disposal systems adopted in developing countries as will be discussed in subsequent chapters of this thesis.

Table 1.1 Variation of waste composition (by weight) in Lagos

| Category | Year | |
|---------------------|------|-------|
| | 1982 | 2008 |
| Putrescible | 60 | 68.16 |
| Plastic | 0 | 11.32 |
| Paper and Cardboard | 14 | 12.46 |
| Others (Fines, etc) | 19 | 4.2 |
| Metal | 4 | 2.08 |
| Glass | 3 | 1.78 |

In addition to waste showing variation trends over time, there are also variations over space with various factors determining what value is placed in materials. The consumption pattern and waste generation rates are highly influenced by the economic activities in different areas, with higher income areas producing higher fractions of non-putrescible waste than other areas. Some of these may be attributed to wastes arising from plastic, cardboard and metal packaging from foods and from other perishable and replaceable products that are consumed in larger quantities by more affluent households (Cointreau, 1982).

The variations over time and space influenced by resource value are functions of technological innovations, cultural norms, and societal values. For example, public acceptance of the use of second-hand clothes is a significant societal barrier facing its reuse. However, new evidence as exhibited by the growing demand for authentic vintage clothing by the middle classes in Britain indicates there is a shift in the value placed on once *valueless* clothing to one of a meaningful resource. It is no longer considered a social taboo for financially secure members of the British middle class to be found perusing the clothes racks of charity clothes shops in the quest for vintage clothing. The same case may be made for the acquisition of vintage vehicles and antique furniture (DEFRA, 2010).

1.2 Waste and sustainability

The Industrial Revolution of the late eighteenth century heralded an up-scaling in the global rate of materials production that has been on the increase ever since. This increase has had a significant impact on the quality of life of rural and urban dwellers as well as on their consumption and waste production patterns. Current trends show that the more developed or industrialised a society becomes, the more complex its material needs are and consequently, the more waste it produces. An example of this may be considered when the basic needs of a typical rural dweller are compared with that of a typical urban dweller. The material resources of the rural dweller will comprise of more locally sourced, organic (biodegradable) materials, for example, fresh farm produced foods, than that of the urban dweller who will have more non-local, non-biodegradable materials, for example, imported tinned food and plastic packaging from shops.

The issue of waste generation and consumption is a phenomenon that was officially recognised globally through the outcome of the proceedings at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil in 1992 (UN, 1993). The conference yielded the development of a set of 27 principles for sustainable development titled Agenda 21.

The area of Agenda 21 that is crucial to this research is found in Section 2, Chapter 21.4 where it states that:

“Environmentally sound waste management must go beyond the mere safe disposal or recovery of wastes that are generated and seek to address the root cause of the problem by attempting to change unsustainable patterns of production and consumption. This implies the application of the integrated life cycle management concept, which presents a unique opportunity to reconcile development with environmental protection”

This statement makes the case for an integrated approach to addressing the waste management issue.

1.3 The Waste Hierarchy

Agenda 21 also proffers a four point strategy to addressing solid waste management in the form of:

- a) Minimizing waste production
- b) Maximizing environmentally sound waste reuse and recycling
- c) Promoting environmentally sound waste disposal and treatment and;
- d) Extending waste service coverage.

Figure 1.1 presents the waste hierarchy - a policy guideline that is part of many national environmental laws and policies - in a simple paradigm showing how waste should ideally be managed from the best (top) to least desired (bottom) approaches (DEFRA, 2007; Pitt and Smith, 2003). It is a waste management policy guideline that promotes the avoidance of waste production as its top strategy followed by the minimisation of produced waste in situations where avoidance (which may manifest in the forms of technological, social or legal constraints) may not be possible.

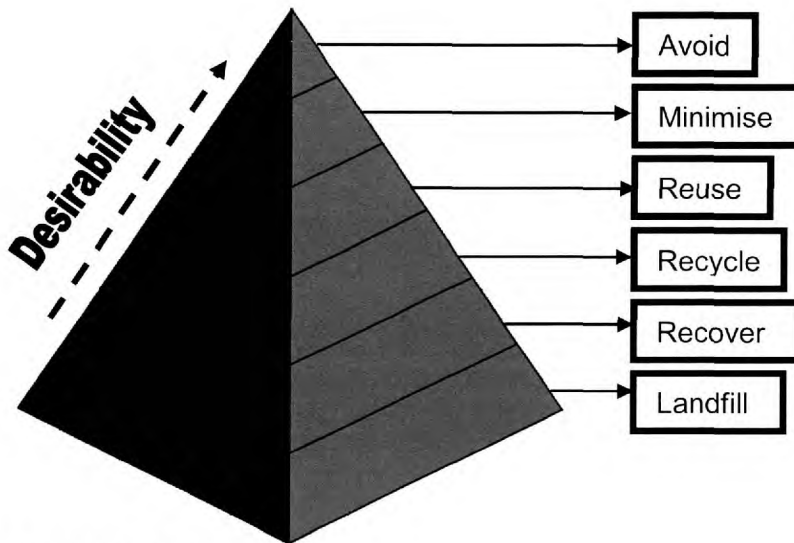


Figure 1.1 The Waste Hierarchy

Ideally, once waste is produced, the next strategy in managing its impact will be to tap into the resource value of the material, thereby reclassifying what was formerly a non-value material as a resource and finding valuable use for it. This may be accomplished in 3 distinct but complementary ways (Reuse, Recycling and Recovery).

First, the material may be processed and used again for its original purpose, for example, empty drinking water bottles may be sterilised and reused for storing drinking water or unwanted furniture from a household may be donated to others for their use, perhaps after some repair. The reuse of materials reduces the need for the manufacturing and production of more of the items for a while. Since most produced goods are sadly not made to last for ever, there will be a gradual loss in the value of the reused material as it goes through numerous reuse cycles.

When a material can no longer be safely reused (due to practical, technological, economic or social constraints), the resource value left in the original material is tapped and recycled as input in the production of new materials which may or may not be similar to the original material in appearance or purpose, for example, staying with the plastic bottle, after numerous reuse cycles, wear and tear may render it no longer suitable for reuse as a receptacle for drinking water. The plastic may then be shredded and processed into fleece fibres for the manufacture of thermal clothing.

Ultimately, not all materials are able to be recycled repeatedly, for example, recycling food waste into compost, and some are not able to be recycled at all. When this is the case, providing there is the potential for energy recovery, the useful resource value (which may be its calorific value) is recovered to produce energy.

After all the various options for waste prevention, minimisation, reuse, recycling and recovery have been exhausted, the remaining option is disposal in a safe and environmentally sound manner, of which landfill is one of several disposal options. This is done to reduce the potential negative impact its interaction with the environment may cause.

The waste hierarchy framework assumes that all wastes are controlled and its aim is to move waste management solutions 'up' from a fully engineered landfill towards the avoidance of waste produced. The current situation in most developing countries, in this case, Lagos, differs slightly from the ideal waste hierarchy. Wilson et al (2001) highlights that since most developing countries currently use open or uncontrolled dumping (see Figure 1.2), which may be in the form of landfills which lack appropriate leachate and emissions capture and control, as well as any other form of land or water based dumping, it is necessary to phase this practice out and at least 'lift' them on to the bottom of the conventional hierarchy, which in this case is a move from uncontrolled dumping to controlled landfills.

The reasons for the current methods of managing wastes in ways that do not control their interaction with the environment, particularly in developing countries vary from purely economic reasons, where the financing to build and manage engineered landfills may be unobtainable, to the lack of effective waste policies and management techniques.

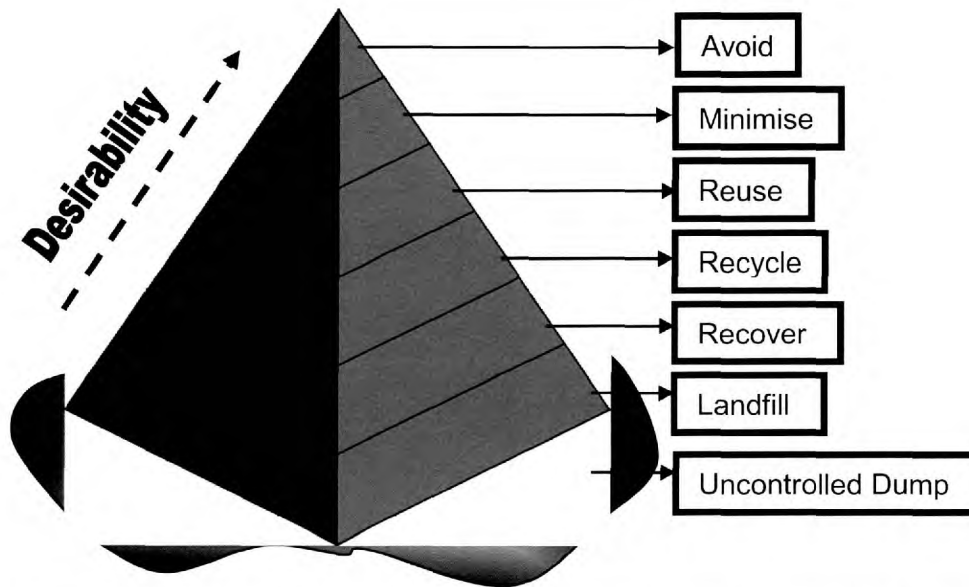


Figure 1.2 Developing Country Waste Hierarchy (Based on Wilson, Whiteman and Tormin, 2001)

1.4 Integrated Sustainable Waste Management

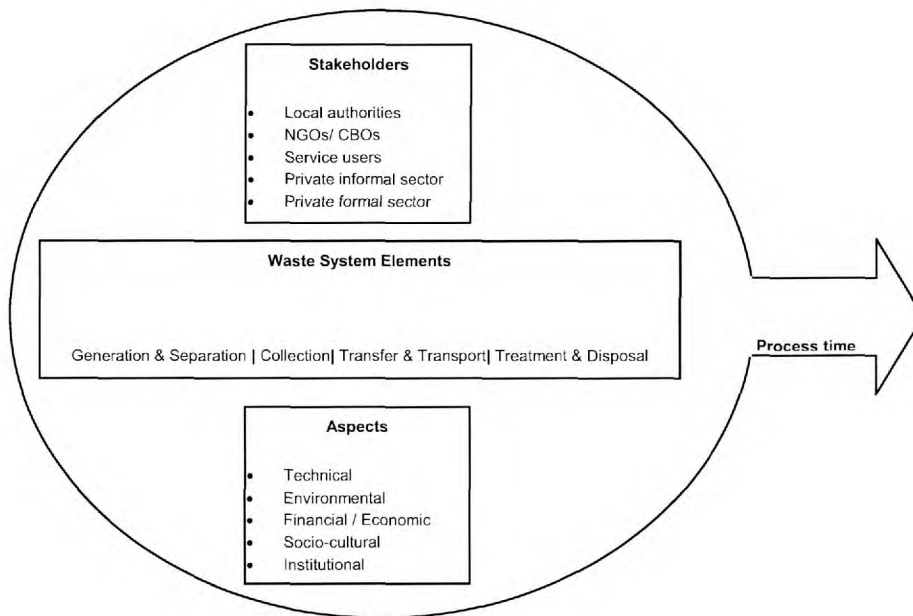


Figure 1.3 The ISWM Model from Van de Klundert and Anschütz (2001)

Integrated Sustainable Waste Management (ISWM) is a framework, based on the waste hierarchy, developed out of experience for low and middle income countries, to address various issues that arise from the management of solid wastes through understanding the *who*, the *what*, the *why* and the *how* of solid waste management and change (Scheinberg et al, 2008). It recognises three important dimensions in waste management:

- a) Stakeholders
- b) Waste system elements and;
- c) Sustainability aspects.

1.4.1 Dimensions of ISWM

The ISWM model comprises of 3 dimensions: Waste management stakeholders, waste system elements and sustainability aspects.

Stakeholders

A stakeholder, in the waste management context, may refer to anyone or group of persons who are able to influence / affect, or are influenced / affected by the waste management system. The ISWM framework recognises 5 distinct stakeholder groups in waste management, particularly in developing countries: the Local authority, Non Governmental Organisations (NGOs) or Community Based Organisations (CBOs), which may include donor agencies, the waste service users, the private informal sector, which includes the itinerant waste buyers (IWBs), the street waste pickers and dumpsite waste pickers and finally, there is the private formal sector, which in most cases operates under a Private Sector Participation (PSP) or Private Public Partnership (PPP) with the local authorities. These 5 groups form the key waste management stakeholders in developing countries. The degree to which each stakeholder group influences or is influenced by the waste management system varies. However none of them can efficiently operate within the waste management system in isolation alone from the others.

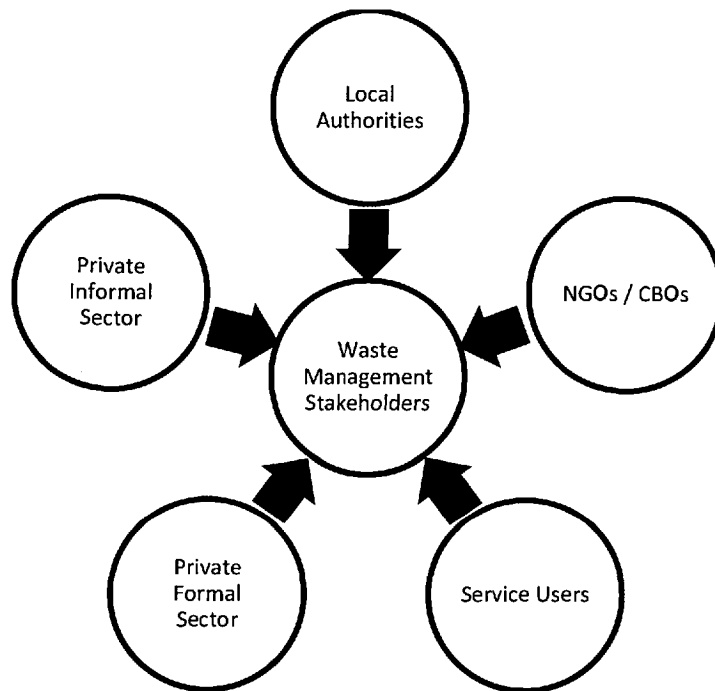


Figure 1.4 Waste Management Stakeholders

Waste System Elements

The elements of waste management include all stages involved in the flow of waste materials from the point of generation until final treatment and disposal. Scheinberg et al, (2010) refers to system elements as the technical component of a waste management system and also states that part of the purpose of using the ISWM framework is to show that these technical components (elements) are part of the overall picture and not all of it. Van de Klundert and Anschütz (2001) state that ISWM recognises the high-profile elements 'collection', 'transfer' and 'disposal' or 'treatment' and it gives equal weight to the less well understood elements of 'waste minimisation', 'reuse' and 'recycling and composting'. They further explain that the history and character of a locality will influence which elements of the waste system are present and which are absent or under-developed. Furthermore, they also indicate that a full ISWM process seeks to supplement the existing waste system so that all elements are represented, which may suggest the inclusion of waste prevention or minimisation, reuse and recycling to the existing system if they are absent or under-developed.

Sustainability Aspects

Van de Klundert and Anschütz (2001) describe the 6 aspects of the ISWM model as these:

- a) Environmental aspects. This focuses on the effects of waste management on land, water and air as well as on the need for conservation of non-renewable resources and also pollution control and public health concerns.
- b) Political/legal aspects. This addresses the boundary conditions in which the waste management system exists: setting goals and priorities; determination of roles and jurisdiction; the existing or planned legal and regulatory framework; and the basic decision-making processes.
- c) Institutional and organisational aspects. This relates to the political and social structures which control and implement waste management: the distribution of functions and responsibilities; the organisational structures, procedures and methods implicated; the available institutional capacities; and the actors such as the private sector who could become involved. Planning is often considered the principal activity in relation to institutional and organisational aspects.
- d) Social-cultural aspects. This includes the influence of culture on waste generation and management in the household; the community and its involvement in waste management; the relations between groups and communities, between people of various ages, sex, ethnicity and the social conditions of waste workers.
- e) Financial-economic aspects. This relates to budgeting and cost accounting within the waste management system and in relation to the local, regional, national and international economy. Some specific issues are: privatisation; cost recovery and cost reduction; the impact of environmental services on economic activities; the commodities marketplace; efficiency of municipal (ecological) sanitation management systems; macroeconomic dimensions of resource use and conservation; and income generation.
- f) Technical and performance aspects. This pertains to the observable practical implementation and maintenance of all of the waste system elements: what equipment and facilities are in use or planned; how they

are designed; what they are designed to do; whether they work in practice; and how clean the city is on a consistent basis.

The integrity of a sustainable waste management system depends on the synergy of these aspects in that if any aspect is compromised, it may affect the operation of the others and thus lead to the failure of the system. Scheinberg et al (2010) highlight that the aspects of waste management serve to provide a series of analytical 'lenses', which may be used for example in assessing the situation, determining feasibility, identifying priorities, or setting adequacy criteria in a waste management system. A hypothetical set of 'issues' is listed below and placed alongside the corresponding aspect each may affect:

- a) Technical (or Technological)
 - i. Adoption or use of inappropriate waste technologies, for example, the deployment of incinerators for treating wet, dense waste
- b) Institutional (or Administrative)
 - i. Dearth of qualified and experienced waste management professionals at the municipal and state level
- c) Financial
 - i. Poorly designed waste management contracts which may unduly favour either the waste contractor or the municipality
 - ii. Low budgetary allocation (by municipality or state) for waste management services
 - iii. Corruption
- d) Legal
 - i. Absence of coherent waste policies
 - ii. Weak legislative frameworks to support waste management policies
 - iii. Non enforcement of waste legislation
- e) Social (or Human)
 - i. Lack of end-user buy-in of waste strategies
 - ii. Ineffective communication of end-user waste management obligations
 - iii. Issues of end-user willingness to pay for waste services
 - iv. General apathy of end-users towards pro-environmental behaviour

- v. Lack of time for end-users to participate in waste collection services, etc.

Some of these issues could easily be classified under more than one category - for example, corruption could also be placed under institutional, legal and social components. This demonstrates the strong linkages between the various aspects of a waste management system, and suggests that a single dimension approach to addressing waste management issues may lead to a compromised system.

1.4.2 Underlying principles of ISWM

Van de Klundert and Anschütz (2001) mention 4 underlying principles that guide the ISWM framework: equity, effectiveness, efficiency and sustainability.

- a) The equity principle refers to the notion that all citizens are entitled to an appropriate waste management system for environmental health reasons. Van de Klundert and Anschütz (2001) suggest that this principle goes beyond a moral imperative because the effects and impacts of poor waste management practices are not always isolated within the polluted areas. For example, local dumping of wastes into storm drains may lead to flooding (and the spread of water borne diseases) over large areas. Also, the open burning of wastes transfers the released gaseous pollutants over large areas by air. Polluted areas lead to poor living conditions which may foster social unrest and anti-governmental activities and abandoned waste is a symbol of a failed public service. Also, unclean neighbourhoods can affect a city's economy and stifle economic development. Finally, investors will not be inclined to invest in a dirty place and infirm labourers have low productivity.
- b) The effectiveness principle implies that the waste management model applied will lead to the safe removal of all waste. Van de Klundert and Anschütz (2001) define effectiveness in this context to be where all waste is removed as planned and all recoverable materials are recovered. They state that when effectiveness is limited to some parts of the city and not the whole, for example, city centres, tourist areas or business districts, the overall waste management system is not fully effective.
- c) The efficiency principle states that the management of all waste is achieved by maximising the benefits, minimising the costs and optimising

the use of resources, taking into account equity, effectiveness and sustainability. The service is efficient when the benefits of good waste management systems are balanced by all beneficiaries paying a reasonable cost to keep them that way, using the optimal combination of labour, money, equipment, machinery and management.

- d) The sustainability principle refers to the deployment of a waste management system that reflects local (cultural) conditions and is feasible from a technical, environmental, social, economic, financial, institutional and political perspective which can maintain itself over time without exhausting the resources upon which it depends. Van de Klundert and Anschütz (2001) suggest that these resources may be human (manpower), material (equipment) or natural resources (water, air, soil) and also state that a system is considered sustainable when it can reproduce itself without reducing the possibilities open to the following generation of systems.

1.4.3 Benefits of ISWM

The main goal of the ISWM model is to improve the system-wide efficiency of waste management in its three target areas: Public health, environmental protection and resource management (Scheinberg et al, 2010). It is beneficial in the design of sustainable waste management systems because it:

- a) Presents an objective appraisal of the interactions of all stakeholders within the waste management system, with the aim of harnessing the strength of each one, while compensating for their weaknesses.
- b) It considers comprehensively all the stages involved in the flow of materials from generation to final disposal.
- c) It evaluates all 6 aspects of waste management equally, including the technical and financial aspects, while not unduly laying emphasis on these 2 to the detriment of the rest.

Finally, the ISWM model encourages waste management system designers and planners to take a holistic view of the entire waste management system and appraise its components as complementary parts of an integrated whole and not as independent branches of a complex system.

The framework is defined as integrated because it reflects the variety of activities that make up solid waste management, as well as the presence of linkages between system elements, and suggests that not only technical, but also legal, institutional and economic linkages are necessary to make the system function.

1.5 Why do (some) waste management systems fail?

There are many factors which may cause waste management systems to fail. The causes may arise from either one of the 6 earlier mentioned waste management aspects or a combination of two or more of these aspects. The World Bank's Strategic Planning Guide for Municipal Solid Waste Management (SPG) (Wilson et al, 2001) lists 7 stages in planning a waste management system (see Appendix A-1), which may be simplified into 3 stages (see Figure 1.5).

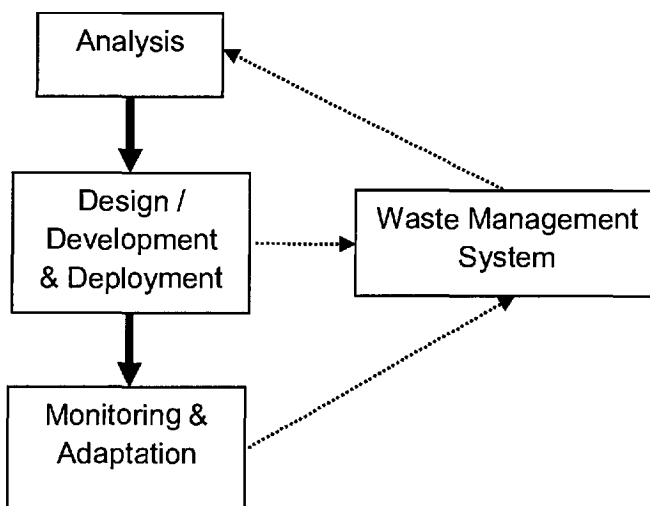


Figure 1.5 Stages in the design of a waste management system

The 3 key stages involved in designing an efficient waste management system are:

- a) Analysis (of the current waste management practices / situation);
- b) Design / implementation (deployment of appropriate waste management system based on prior analysis) and finally;
- c) Monitoring (of deployed system(s) to identify and test the integrity of the selected system(s) and make timely corrections and improvements where necessary).

The monitoring phase of designing a waste management system is critical, because it should not be taken for granted that the selected waste system(s) based on analysis will be most ideal the first time round. Monitoring allows the designers of the system to adapt or improve on their earlier design to accommodate any unforeseen outcomes in implementing the system. Bypassing any of the three steps – analysis, implementation and monitoring – leads to the failure of the waste management system.

It is difficult to clone and replicate successful waste management systems from one area to another for the very same reason that makes the system successful in the first place. A waste management system in an area (say location A) may be efficient and successful if the three stages highlighted in Figure 1.3 are adhered to. This makes the waste management system for location 'A' specifically designed and adapted for its local situation. Consequently, if for example, a second location (say location B) would wholly implement the 'successful' waste management system from location A, there would be no guarantee of its success in location B because there may be differences, however minute, in the 6 aspects of waste management earlier mentioned between locations A and B. This observation forms one of the key highlights of the UN-HABITAT report (Scheinberg et al, 2010).

Evidence exists to highlight previous attempts at replicating otherwise 'successful' waste management systems from one area into another, with municipalities in southern hemisphere developing countries not only sometimes replicating waste management systems from other southern hemisphere countries, but also attempting to replicate waste management systems from northern hemisphere countries (Medina, 2000) which result in catastrophic consequences.

1.6 The challenge of Waste Management systems in developing countries

There is no pre-determined set of rules as to what makes for a sustainable waste management system. However, the critical ingredients are the 3 components highlighted by the ISWM model and how they integrate together and fit into every local situation in which they are deployed. For example, local situations ought to determine the selection of appropriate technology in a waste management

system, just as a critical overview of existing systems ought to be reviewed before an upgrade is considered. This is where evidence based research comes in. In designing a waste management system, three questions are pertinent: What (is to be done?), Why (should it be done?) and How (may it be achieved?). Investigating the type of waste management system to be adopted, justifying the selected system and organising its implementation forms the thrust of evidence based research in waste management. The absence of scientific evidence from the policy (system) formulation procedure devalues the systematic approach and reduces the entire selection and adoption process to mere guesswork and increases the risk of systemic failure.

Common problems facing the sustainability of waste management systems in developing countries include: inadequate technical capacity, paucity of funding for the sector, assimilation of inappropriate technology, lack of political will to introduce and or enforce pro-environmental policies, lack of information about the negative environmental impacts of poor practices, perceived anti-environmental attitudes and lack of public participation in pro-environmental activities - the list is not exhaustive. These issues may be described as 'legacy' issues, in that they are well known and have been well documented. Recently however, a systematically 'higher' set of issues has been shown to compromise the sustainability of waste management systems in developing countries – the dearth of scientific evidence that underpins all waste management decisions.

Evidence based research has increasingly been brought to the forefront of environmental policy development, especially in more developed countries like the United Kingdom (UK) (DEFRA, 2008) and more recently, in low and middle income countries (Scheinberg et al, 2010; Wilson et al, 2009). The use of science based evidence to underpin environmental policy serves to validate policy decisions and provides a framework to review the efficacy of such policies in addressing environmental issues. Decision-making regarding the selection of waste management systems in developing countries, for example in Lagos, has been handicapped by the lack of qualitative and informative science backed, data from which waste management systems may be developed. This dearth of baseline information poses an immediate threat to the sustainability and success of waste management interventions in areas where they are lacking.

Typically, waste management policy in most developing countries has been driven by and large in the absence of a comprehensive understanding of the issues that lead to the generation of waste. Neither is there a platform for the main producers of waste and recipients of waste collection services to have input into the development of policies. The trend of formulating waste management policy without due consideration for the intended service recipients through understanding attitudes and behaviours towards waste management issues is not isolated to the developing world. There has, however, been a significant shift towards the formulation of waste management policy underpinned by scientific evidence within the industrialised countries since the early twenty first century (Wilson et al, 2007) as well as the issue of stakeholder inclusivity in waste management policy formulation (Scheinberg et al, 2010).

The Scheinberg et al, report (2010) highlights that financial sustainability, the development of sound policies and institutions and, especially, the inclusivity of all stakeholders are the critical components that contribute to the success of the ISWM system. The inclusivity of householders in the ISWM model, it is reasoned, will contribute towards the success of household waste management interventions.

1.7 Research Aims and Objectives

One of the challenges of household waste management in developing country cities is to acquire and utilise scientific based data to understand the underlying attitudes and motivations for environmental behaviour among householders, with the aim of evolving location and time specific environmental policies that may be periodically evaluated and amended as local conditions require.

This thesis hypothesises that the acquisition and utilisation of social evidence from householders in the household waste policy formulation process is important for the success of waste management interventions. This hypothesis will be tested using the city of Lagos, Nigeria.

To achieve this research aim, the following objectives were defined:

- a) Review the historical evolution of household waste management policy in Lagos;

- b) Review the models of evaluating attitudes and behaviour towards waste management;
- c) Examine the major household waste management issues in Lagos;
- d) Examine the major factors that influence household attitudes to waste management in Lagos;
- e) Establish a baseline of household attitudes and behaviour to waste management in Lagos;
- f) Establish a framework for integrating social evidence (household attitudes) into solid waste management policy;
- g) Suggest policy recommendations that will influence household attitude changes to waste management in Lagos based on research methodology.

1.8 Thesis Structure

This introductory chapter has set the scene for the aim of this thesis. Solid waste management has been established as not only a local problem in developing countries, but a global one that will continue to challenge both academics and waste management practitioners.

Chapter 2 provides a contextual review of the history of waste management systems and interventions in Lagos from the early 19th century to the present day. The chapter utilises historical records to establish how waste management policy has been developed, its main drivers and how these have influenced subsequent systems deployed.

Chapter 3 provides a review of previous research on attitudes and behaviours towards the environment, beginning with the historical background in the field of attitudes and behaviour in environmental management, leading to major paradigms and methodological frameworks in Europe and North America and finally highlighting recent attitude / behaviour research on waste management in developing countries.

Chapter 4 discusses the methodology adopted for the research fieldwork. The details of how the research aims and objectives will be met are discussed in this chapter as well as the limitations of this methodology and any other methodological issues encountered.

Chapters 5 and 6 present the quantitative and qualitative results from the research fieldwork. Chapter 5 uses quantitative based questionnaires to establish the main waste management issues for householders in Lagos while also establishing the existence of a value-action gap in household waste management through measuring pro-environmental behavioural intent and observed behaviour. Chapter 6 follows up from the quantitative results in the earlier chapter by providing a combination of qualitative and quantitative data to examine the barriers and motivations for pro-environmental behaviour through the use of focus groups; the quantitative data acquired in this chapter are used to validate the data derived from the previous chapter.

Chapter 7 analyses the results from both Chapters 5 and 6 and summarises the key elements of the baseline of household attitudes to waste management in Lagos while also highlighting the importance of householders as a key stakeholder group within a sustainable waste management system.

Chapter 8 presents a theoretical framework highlighting the impact current waste policy strategies will have on the waste management system as well as suggesting policy adjustments based on the acquired evidence from the research.

The thesis concludes with a final Chapter (Chapter 9) on the main research findings as well as the implications of the results derived from it. It also suggests ideas for subsequent research and new areas that will be of practical and academic relevance.

CHAPTER 2. WASTE MANAGEMENT POLICY AND PLANNING IN LAGOS

2.1 Introduction

This chapter presents an overview, within a historical context, of the drivers that have helped to shape waste management strategies, systems and policies in Lagos over the last century and a half.

Lagos is the premier industrial and port city in West Africa. It is the financial capital of Nigeria and is also home to almost 60 percent of Nigeria's non-oil economy. The population of the city of Lagos, which is currently estimated to be between 9 and 17.5 million, is larger than that of at least 28 African countries.

As at 2006, it was estimated that Lagos was generating 4,000 to 6,000 tonnes of municipal waste per day. Of this amount, about 42% was collected by the private operators appointed by the Government and 39% by private informal sector collectors which include cart pushers and itinerant waste buyers contracted by individual households. 11% of the uncollected waste ends up in illegal dumpsites that proliferate across the city, 4.2% is disposed of within neighbourhoods, some of which ends up in storm drains, gets burnt in heaped piles or is buried within residential premises. About 1% of the wastes are disposed of in public bins, and 2.1% get disposed of in "other" ways (World Bank, 2006).

The sections below describe, as accurately as possible, the history of waste management legislation, policies and strategies in Lagos from the late nineteenth century to date.

2.2 Emergence and Expansion – The Urbanisation of Lagos

Lagos has served as the commercial nerve centre of West Africa and Nigeria for over a century. It may be argued that it has become a victim of its success, for its economic potential as a commercial hub has attracted a host of industries, with the concomitant migration of skilled and unskilled labour from rural areas and other urban areas across Nigeria as well as from neighbouring countries (Gandy, 2006). The rapid urbanisation of Lagos over the last 50 years, along with a shortfall in planning and structural processes to accommodate this growth,

continues to place huge burdens on public utilities and services, not to mention the negative social impact this seeming lack of planning has had on the perception of the city.

Historically, the earliest foreign accounts of any reference to Lagos were made by Portuguese explorers in the early 15th century who noted the existence of a small fishing community inhabited primarily by the Awori people on the south-western coast of Africa, in what is present day Nigeria, and named it *Lago de Curamo* (later shortened to Lagos). It is also known as *Èkó*, by the indigenous Yorùbá. Lagos grew rapidly as trade and commercial activities along the West African coast expanded as well as with other communities within the neighbouring hinterland and increased to become a major port city (Badagry) during the slave trade era (early 16th century to the early 19th century). It served as the capital of the Nigeria colony under the British colonial administration from 1914 to 1960 and later became the capital of the Federal Republic of Nigeria on the 1st of October, 1960 - a position it held until 1991 when the capital was relocated to Abuja. Indeed, Lagos has gone through numerous political, economic and social transformations from its early years to its present position as not only the major business capital of Nigeria but also a major world city and, arguably, the most important business hub in Africa outside South Africa.

Lagos has experienced tremendous growth since its establishment in the early 15th century. The metropolitan area presently covers about 3,500 km². The population of Lagos has grown considerably from the earliest recorded population figure of 25,000 in 1866 (Ayeni, 1981), steadily rising to 40,000 by 1901 and 74,000 by 1911 (Abiodun, 1997). The major catalysts for population growth then were natural population increase and rural – urban migration, with natural increase having the predominant influence. The major increase in population began around the mid 20th century after Nigeria gained political independence from Britain in October 1960. Lagos, being the capital city of the newly independent Nigeria, witnessed a significant surge in rural-urban migration from all parts of the country as well as the influx of skilled workforce from neighbouring cities, both from within Nigeria and also from other West African countries, to run the emergent manufacturing and service industries.

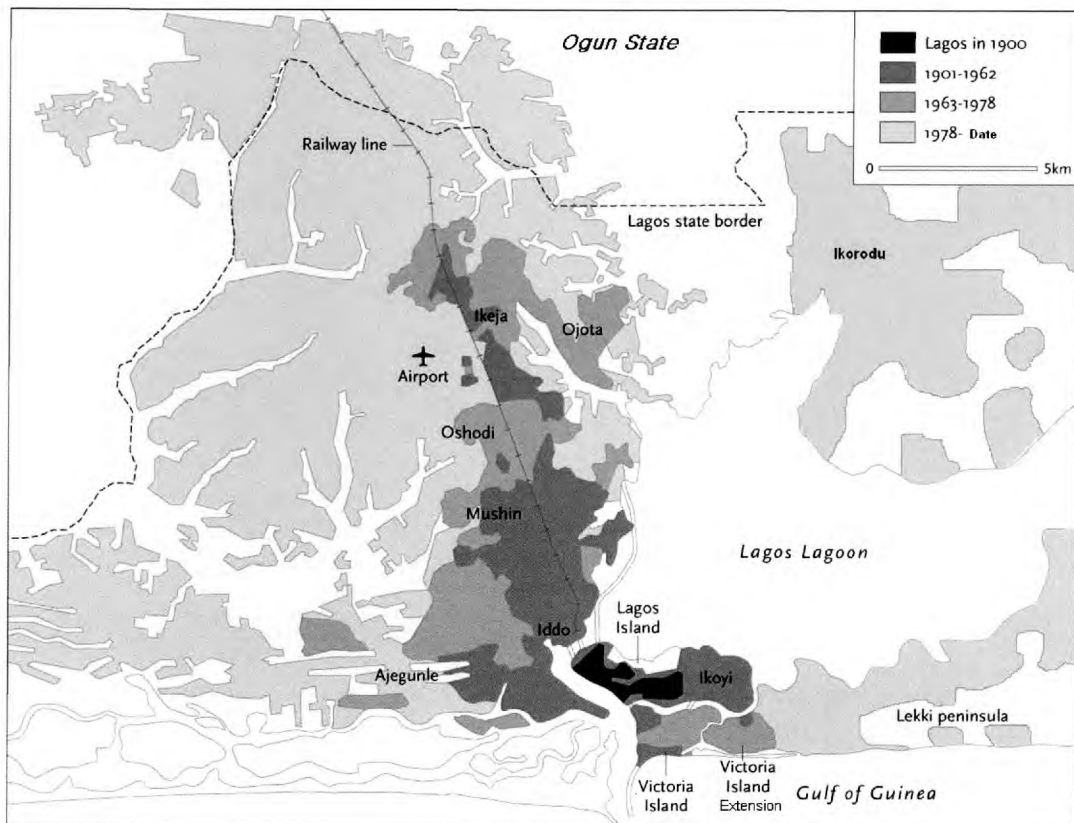


Figure 2.1 The population spread of Lagos 1900 - Date. Updated and modified from Gandy, (2006)

By 1963, the population of Lagos was put at about 663,000. The population of Lagos is currently disputed, with varying figures of 17.5 million and 9 million, being the results of the two censuses carried out by the State and Federal Governments, respectively, in 2006. Notwithstanding, the current natural increase in population, coupled with a constantly high immigration rate since the late 1960s, has greatly influenced the present state of affairs. Lagos, the smallest but also one of the most economically viable states in the Federation of Nigeria, is burdened with providing the infrastructure to meet the present and future needs of its citizens who account for around 10 percent of the entire country's population of over 150 million.

2.3 Drivers for Waste Management Policy in Lagos

The complex history of Lagos and the factors that have shaped its existing solid waste management structures, strategies and policy frameworks are directly connected to successive political and administrative structures as well as urban planning strategies over the last century. To aid the narrative that will follow in the next few sections, a timeline of waste management policies in Lagos has been developed (Figure 2.2). This timeline has been segmented along four distinct themes; Waste Management legislation, Waste Management Administration, Years with significant environmental incidents and years with International Donor Agency (IDA) assistance. In summary, Figure 2.2, shown later in this chapter represents an amalgamation of four distinct but complementary timelines.

2.3.1 Pre 1901 - Dawn of colonial administration

Lagos was ceded to British rule by Oba (King) Dosunmu in 1861 and became a colony of the British Empire in 1862. From 1866 to 1874 it was administered from Freetown (Sierra Leone) by the colonial government as part of the West African Settlements and from 1874 to 1886 it was administered as part of the Gold Coast (present day Ghana) colony. Lagos became a separate crown colony again in 1886, and was amalgamated with the Protectorate of Southern Nigeria in 1906.

The earliest documented evidence of attempts by the colonial administrators of Lagos to address the issue of solid waste management in Lagos was in 1863 with the promulgation of the Town Improvement Ordinance to control development and urban sanitation (Oduwaye, 1998; Falola and Salm, 2004). This was influenced by the UK public health acts of 1848 and 1875 (see Box 2.1), where the growing body of evidence had established for the first time the relationship between crowded, filthy environments and their impact on the health of the local population (Stock, 1988).

This legislation was followed by the formation of the Lagos Sanitation Board in 1899, an advisory board consisting of nine members who were charged with the responsibility of advising the Municipal Government on matters relating to sanitation (Ayeni, 1981). The areas under the jurisdiction of the Municipal Government at the time included Ebute Metta, Iddo Island and Lagos Island minus Ikoyi Island.

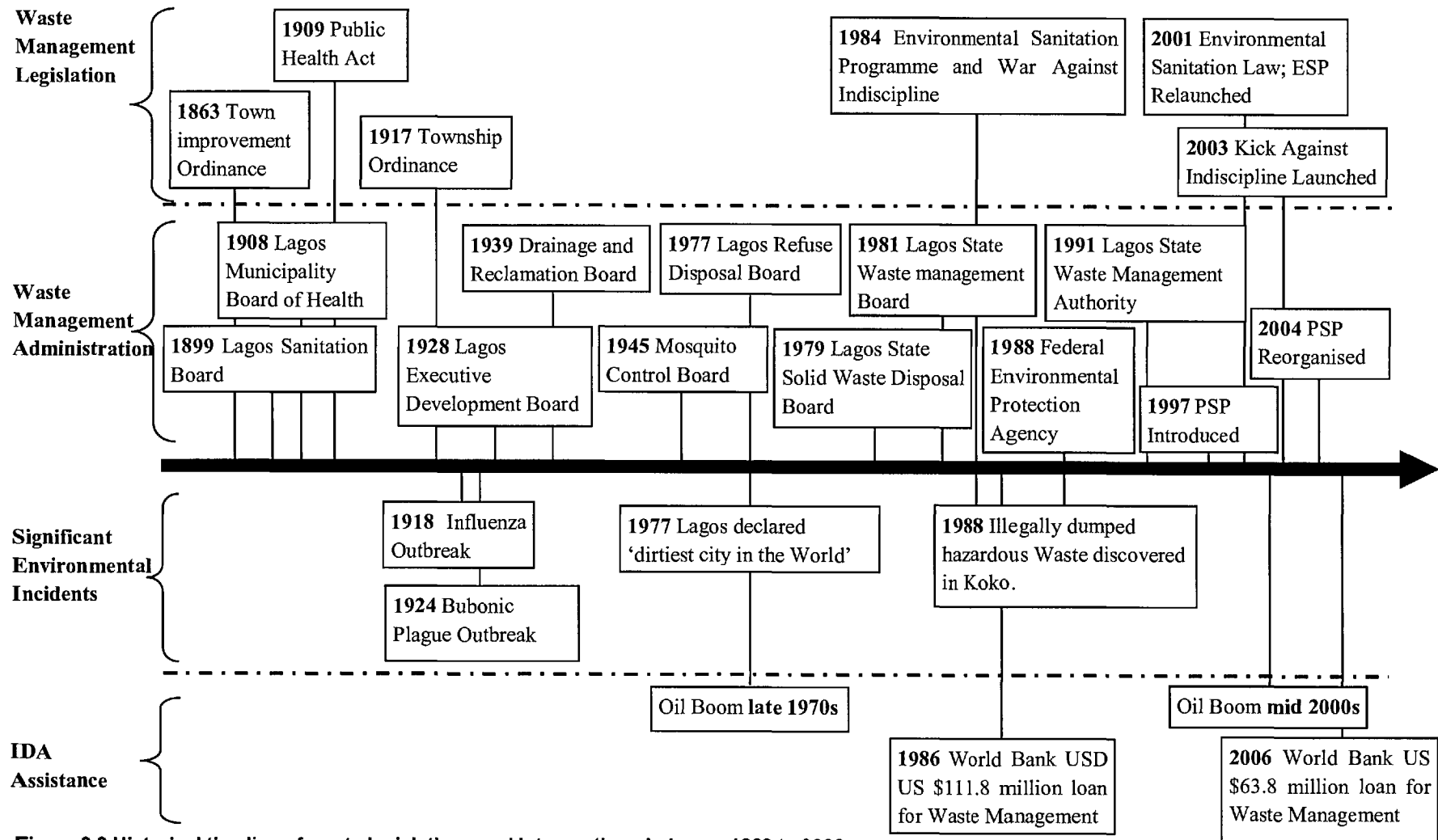


Figure 2.2 Historical timeline of waste legislations and interventions in Lagos 1863 to 2006

2.3.2 1901 – 1960 - The Public Health years

A planning ordinance was enacted in 1902, empowering the Governor of Lagos to designate areas as Government Reservation Areas (GRAs), which, in reality, were areas for the exclusive purpose of European residency. A few areas were selected, among which were Apapa, by the major port, and Ikoyi Island. The remaining areas in the city were designated native towns.

The Lagos Municipality Board of Health was instituted in 1908 in response to the spreading threat of the bubonic plague across the West African coast in the early twentieth century (Dorward, 1979). It was moulded along the structure and function of the 1899 sanitation board. Another major task of the board was to check the growing sanitation concerns arising from the rapid urbanisation of the city. The Public Health Act was created in 1909 primarily for improving sanitary conditions in Lagos. It was enforced through the deployment of sanitary inspectors (locally called *wólé wólé*), who were legally empowered to go into residencies to ensure that the houses and their surroundings were clean and in compliance with the requirements of the Act.

The British Colony of Lagos was unified with the Northern and Southern protectorates in 1914 to form what then became known as Nigeria. Lagos was designated as the capital of the newly formed country.

The Township Ordinance of 1917 created a three tier classification system of settlements within Nigeria which was directly related to the population of Europeans resident in each settlement, namely, the native city at the bottom, the non-European township in the middle and the European reservation (GRA) at the top (Mabogunje, 1977 in Mabogunje, 1990). Mabogunje (1990) notes that the native city's structures remained traditional in their outlook, maintained the 'largely undifferentiated jumble of mud buildings with poor layouts and residents lived under generally poor environmental conditions and hardly any infrastructural facilities'. The higher classed non-European townships or native reservations were not as well planned as the European reservations. The European reservations were well planned and usually surrounded by a non-residential belt - the cordon sanitaire, based on the model for British habitation in colonies within the tropical regions developed in India (Stock, 1988).

Lagos, being the major port city, had the most European residents and consequently, was assigned the highest class in the township categorisation system. The allocation of amenities and physical infrastructure by the colonial administration was based on the rank of towns (Bigon, 2005), with higher classed towns receiving a greater proportion of the allocated budget for the colonial territory. This classification system formed part of the larger 'indirect rule' method of colonial administration where designated townships were governed outside of native jurisdiction (Crowder, 1964). Most of the resource allocation to Lagos was utilised for the improvement of the GRAs while the native towns within Lagos were largely bypassed (Oduwaye, 2009).

Within the indirect rule system, traditional rulers exercised jurisdiction over the lowest classed native townships and they were wholly responsible for the provision of services, mostly through local taxes, and had no recourse to funds from the colonial authorities, much in contrast to the European reservations and non – European townships. Stock (1988) highlights that 'the principle of indirect rule which gave responsibility for service provision and social control to traditional rulers served to absolve colonialists of the responsibility for protecting the health of the African masses where the priority of the colonial administration was not on the well-being of the general population, but on the exclusive health of its staff and their ability to run the affairs of the colony. This was reinforced by Stock (1988) where he notes that 'the principles of indirect rule, however, did not prevent colonial authorities from essentially dictating that certain programmes be undertaken by the native authorities. Some of these were 'sanitation' programmes designed to benefit Europeans.'

The new status of Lagos as the country's capital, coupled with its designation as the only first class town led to a surge in migration from various parts of the country as well as from other major cities along the West African coast (Nzegwu, 1996). This migratory influx resulted in an expansion of industrial and commercial activities across the area which led to a further upsurge in migration towards the city and consequently spurred the spatial population expansion beyond its original municipal boundaries. This surge in population size led to severe strains on public utilities, one of which was the sanitation services. Gandy, (2006) notes that colonial administrators had originally 'sought to transform Lagos into the Liverpool of West Africa', but as external financial support from the British

Treasury waned, primarily because its aim in West Africa was not to establish a permanent administration in the area (Lugard, 1922) but rather to exploit the commercial resources available in the region. Gandy (2006) also notes that there were attempts by the colonial administration to modernise the drainage and sewage system across Lagos in the 1920s but this plan was postponed and later abandoned completely at the onset of the Great Depression (1928-1939). A second attempt to create an integrated sewage system in the city in 1956 was truncated due to funding constraints as well as the intervention of corrupt Lagos Town Council members who had heavy business connections with the monopolised night-soil collection system (Williams and Walsh, 1968).

Urban planning in Lagos not only suffered as a consequence of funding inadequacies, there was also the issue of the laissez faire administrative system of government where the indigenous populations were allowed to determine the spatial growth and patterns outside of the European populated GRAs, modelled along old, traditional methods which contrasted against the planning required for the growing new city. Historically, cities in the south west of Nigeria grew out from 'nodal points' of significance. These nodes were usually main markets, town centres, royal palaces or other important landmarks, while the radial footpaths that led away from them followed 'natural', meandering courses. The colonial administrators implemented a policy of 'cultural dualism' where the indigenous population was allowed to maintain 'traditional' forms of urban planning while largely concentrating the financial resources for urban infrastructure, based on public health practices from Britain within the wealthy, European enclaves (Gandy, 2006).

The increasing congestion coupled with the unsanitary living conditions within the native sections of the city of Lagos from 1914 was left largely unregulated and unchecked by the colonial authorities. Evidence exists of reported population densities of over 90,000 / km² on Lagos Island by 1928 (Oduwaye, 2009) and Wren (1924) describes Lagos, in his semi-autobiographical novel *Beau Geste*, as "... the rubbish-heap called Lagos, on the Bight of Benin of the wicked West African Coast...". This literary evidence provides a vivid description of a city divided and burdened by serious waste management problems at the time. The sanitary conditions perhaps played a role in the spread of the influenza outbreak of 1918 (Fourchard, 2006), and most likely acted as a catalyst in the spread of

the bubonic plague outbreak which lasted from about 1924 to 1928 (Olukoju, 1993). The fallout from the plague outbreak prompted the colonial administration to institute the Lagos Executive Development Board (LEDB) in 1928. The LEDB's task was to oversee and approve the design and construction of building plans in the city. It was also empowered to undertake comprehensive land-use planning, re-planning, improvement and general development of the Lagos territory (Oduwaye, 2009). However, improvements to the city were restricted largely to the GRAs, while unsanitary native areas were demolished (Gandy, 2006). Gandy (2006) notes that the demolition policy of the LEDB in the native areas provoked increasing anger and hostility from the residents living there and underlined the degree to which planning activities by the colonial authority ignored indigenous African opinion. This epochal event may represent the first documentary evidence of environmental policy being devised and enacted without the input and support of a key stakeholder - the majority of end users in Lagos - a precedent with its detrimental consequences still being felt today.

The final years of this era were marked by the constitution of ad-hoc committees and boards to address the symptoms arising from the underlying infrastructural chaos that plagued the city of Lagos. Two important administrative boards set up in this period were the Drainage and Swamp Reclamation Board and the Mosquito Control Board.

2.3.3 1960 – 1977 - Independence and system dormancy

Lagos maintained its status as the capital city of the newly independent country and was formally made a state in the Federal Republic of Nigeria in 1967. Waste management services were handled by the municipal administrators operating a door to door collection service. The local municipal administrators inherited a system they did not create, nor were they technically or administratively equipped to run efficiently (Gandy, 2006; UN, 1964). Gandy, (2006) notes that by the mid 1960s there were only 30 professional urban planners in the entire country. The pressures of operating a sustainable waste management system in the absence of quality administrative and technical professionals, coupled with the ever increasing population growth witnessed the rapid slide in waste management service provision, with heaps of waste being dumped on roads, in canals and other waterways as well as in storm drains. This period heralded the prominence

of the informal sector in the waste management system where they provided an alternative to the unreliable services being rendered by the municipal administration.

The solid waste management problem came to a head in 1977 when Lagos hosted the Second World Black Festival of Arts and Culture (FESTAC). There were various articles published in international newspapers by visiting journalists about the unsightly sanitary conditions of Lagos, with some going as far as labelling it the World's dirtiest city! This prompted the Federal Government of Nigeria to constitute the Lagos State Refuse Disposal Board (LSRDB), which was established to deal with the mounting accumulation of garbage and abandoned vehicles on the streets. It was given broad powers to plan and operate a citywide refuse collection system which included workshops, depots, tip sites, and refuse vehicle operations. The LSRDB was supervised by the state ministry of works and transport and established under edict 7 of April, 1977 (Adebola, 2006; Lasisi, 2004).

A second significant episode during this period was the mass downsizing of staff across the National Civil Service, which had happened 2 years prior to FESTAC in 1975 (Adamolekun and Ayo, 1989), followed by a second, less severe downsizing exercise in 1984 (Adedibu and Okekunle, 1989). These actions led to a massive dearth of expertise and core competence - not restricted only to waste management - within the civil service of Nigeria, Lagos inclusive. The effects of these exercises are still being felt in the waste management field in Nigeria today as the technical, administrative and intellectual capacity void created in the mid 1970s and 1980s is still evident, particularly in light of the low pay packages within the civil service, especially during the 1980s and 1990s which compelled civil servants to seek employment within the more financially lucrative private sector or migrate out of the country.

2.3.4 1977 – 1989 - Technical and Financial interventions

In 1977, the LSRDB contracted out the waste management services to expatriate waste operators and the funding for these capital heavy contracts came from the increasing crude oil revenue the country received during the oil boom era of 1974 – 1979. The contractors were responsible for the door-to-door collection of household waste and the service areas were largely restricted to Lagos Island

and the mainland, mirroring the set-up that existed with the GRAs of the colonial era and hardly extended to the more densely populated areas in Lagos. Other areas that were serviced had a communal collection system in place where householders would empty their household wastes in designated communal bins. Interestingly, the LSRDB admitted that only about 60% of the population were benefiting from the collection service (Adedibu and Okekunle, 1989). This lack of complete service coverage by the private operators led to increase in demand for a scarce service and most likely may have contributed to the growth and spread of the emerging informal sector waste operations in Lagos. The remit of the private, formal waste service operators was expanded to include the collection of abandoned vehicles and scrap metals in 1979 when the LSRDB became the Lagos State Waste Disposal Board (LSWDB). Ikeja, Shomolu and Mushin areas were also added to the coverage areas for the service. By 1981, LSWDB had its responsibilities expanded to include commercial and industrial waste management as well as storm-drain cleaning (Bartone et al, 1990). Bartone et al (1990) noted that the LSWDB was not financially equipped to sustain its city-wide waste management effort owing to its limited budget and erratic funding, based largely on grants from the Lagos state government.

Three solid waste incineration plants, paid for through an international grant from the West German Government, were constructed in Lagos between 1975 and 1979 at a cost of over US \$30 million and none of them were ever used. Medina (2000) noted that the moisture content of solid waste in Lagos perhaps played a large role in compromising the operations of the incinerators and contributing to their inappropriateness and eventual failure.

The contract of the foreign waste operators was terminated in 1984 mainly due to the inability of the government to meet its financial obligations to the operators. This was as a consequence of the national economic crisis brought about by the sharp depreciation in the value of crude oil in 1982 and the resultant economic recession on the Nigerian economy which led to a rapid depreciation in the value of the national currency, the Naira (₦). The Federal Government had borrowed heavily from international financial institutions during the oil boom period and was now saddled with a huge debt burden compounded by the weak exchange rate between the US dollar and the Naira. The LSWDB was left with the sole responsibility of continuing the household waste management services previously

provided by the foreign operators (see Table 2.1). The inadequate technical and administrative capacity of the constituent members of the board, coupled with the deepening economic recession hampered the release of funds for the timely servicing and maintenance of equipment and purchase of parts. These issues overwhelmed the waste service provision capacity and led to the increase in piles of solid waste being illegally dumped across the city.

The War Against Indiscipline (WAI) programme was launched in early 1984 and was enforced by a paramilitary group known as the 'WAI Police'. WAI was initiated by the new Federal military administration that had recently come into power at the end of 1983 through a coup d'état. The programme identified indiscipline as the main cause for the economic recession the country was slowly slipping into and proffered solutions aimed at curbing corruption in the public and private sectors, promoting patriotic zeal and a diligent work ethic among citizens among others.

The Environmental Sanitation Programme (ESP) – as part of the 'War Against Filth' – formed the fifth arm of the multi agenda WAI programme. It was launched on the twenty-ninth of July 1985 with the promise of a one million Naira prize award (equivalent at the time to US \$1 million) to the cleanest State capital city in Nigeria (Adedibu and Okekunle, 1989). The ensuing mass clear up of waste heaps and drains with the mobilisation of extra manpower supported by the military government in Lagos temporarily reduced the aesthetic blight that the waste heaps had inflicted on the Lagos environment. The ESP in this form was relatively short-lived as another military coup d'état in August 1985, a month after the launch of the ESP, ushered in a new administration which, although it did not cancel the WAI outright, sought to de-emphasise the monetary reward for keeping clean environments. Inevitably, the waste heaps returned to the drains and streets of Lagos shortly after the amendment of the WAI programme.

The ESP was temporary and took a short term approach in addressing what should have been appraised as a deep rooted, long term problem. Stock (1988) concluded that in spite of its flaws, the programme had its benefits even though they were temporary and uneven at times. He mentions the elimination of pathological environmental risks that threatened the urban poor arising from the clearance of waste heaps, as well as the general improvement of the aesthetic appearance of the city and the dissemination of information on sanitation and

health. The media campaign blitz on health and sanitation during the ESP in the mid 1980s represents the first and only significant social campaign targeted at anti-environmental behaviour in Lagos as well as in Nigeria.

2.3.5 World Bank intervention

In 1982, the Federal Government of Nigeria and the Lagos State Government requested assistance from the World Bank in financing a five year solid waste management and storm-drainage project for the Lagos Metropolitan Area. Upon review of the proposal, a US \$72 million loan was approved by the World Bank for the project in September 1985, (WB Loan 2620-UNI) which, at the time, was the largest loan the World Bank had ever approved for a solid waste management project anywhere in the world. The total cost of the project was put at US \$164.3 million while the solid waste component accounted for US \$111.8 million, representing about 68% of the total cost of the entire project. The solid waste component provided funding for the purchase of equipment, new maintenance and depot facilities, and related civil works to enable the LSWDB to improve all aspects of its operations (domestic and industrial waste collections, disposal, abandoned vehicle management, and secondary and tertiary storm-drainage network cleaning and maintenance).

Crucially, this significant investment in the waste management sector coincided with the onset of the global economic recession of the early 1980s which, as earlier explained in the previous section, led to the sharp devaluation of the Naira. Bartone et al (1990) comment that by June 1989, towards the scheduled end of the loan disbursement period, the 600 waste collection vehicles – initially budgeted to cost US \$40 million – ended up costing the government eight to nine times higher than was originally estimated. This was as a result of a combination of factors: the devaluation of the Naira; the complicated local procurement procedures as well as the lengthy delays in disbursement of funds through a tediously bureaucratic civil service in the period between 1985 and 1989.

2.3.6 1989 - Date

The present household waste collection strategy in Lagos primarily involves 3 main groups. First, there is the collection service undertaken by the Lagos Waste Management Authority (LAWMA). LAWMA was established in 1991 under Edict 55 of the Lagos State Government by taking over operations from the disbanded LSWDB. Between 1994 and 1996, LAWMA piloted a Private Sector Participation (PSP) programme in two municipal local governments (Oresanya, Undated). The programme was scaled up in 1997 and the PSP household waste management system was officially rolled out. The current PSP system in place in Lagos was launched in October 2004 across 24 municipal local government areas within the State.

Presently, the household waste management services available in Lagos are; the services rendered by the PSP operators under a concession arrangement with LAWMA, as well as the door to door service rendered by the unlicensed, private informal sector waste collectors whose operations are illegal under the current waste management act in Lagos (LASG, 2001). The informal sector workers mainly comprise of itinerant waste buyers, general waste collectors / cart pushers, street waste pickers, waste dumpsite pickers and scavengers. The itinerant buyers go from house to house to buy reusable and / or recyclable material and either sell it on to others higher up the formal and informal recycling systems or they sell it directly to other end users. The general waste collectors / cart pushers are paid by householders, through a negotiation process mostly based on the volume of the waste, to carry out collection services from door to door; they are responsible for the disposal of the collected waste, which in some cases ends up being fly-tipped into storm drains, streams and on open ground and illegal dumps (which provides the rationale for their activities being made illegal). LAWMA is primarily responsible for street cleansing, collection of medical waste as well as management of waste in public places; it also provides collection services to some commercial clients. The areas covered by the PSP operators are mostly within the metropolis of Lagos State while peri-urban areas largely remain poorly serviced.

Table 2.1 Evolution of Waste management Institutions in Lagos (1977 – date) based on Adebola, 2006

| Years | Name of institution | Supervising Authority |
|--------------|---|--|
| 1977 | Lagos State Refuse Disposal Board (LSRDB) | Ministry of Works and Transport |
| 1979 | Lagos State Waste Disposal Board (LSWDB) | Ministry of Works and Transport |
| 1991 | Lagos State Waste Management Authority (LAWMA) | Ministry of the Environment and Physical Planning (MEPP) |
| 1994 | Local Government Councils and LAWMA | Local Government (LG) and MEPP |
| 1997 | LAWMA and PSP pilot scheme in Shomolu & Kosofe LGAs | MEEP |
| 1998 | PSP in domestic waste management state-wide and LAWMA handling Industrial Waste | MEEP / LGs |
| 1999 | PSP in waste management | LGs / Ministry of the Environment/ Office of the Deputy Governor |
| 2004 | Mega/ major PSP in waste management | Ministry of the Environment/ Office of the Deputy Governor |

Box 2.1 Selected waste management events in the UK

1297 - Law is passed to make householders keep the front of their house clear from refuse. It is largely ignored. However, most waste is burned on household open fires.

1354 - "Rakers" are employed in each London ward to rake rubbish together, load it into carts, and remove it once a week.

1407 - It is ruled that household rubbish is to remain indoors until it can be removed by the rakers after which it is either sold as compost or dumped in the Essex marshes. This preliminary attempt to manage and control waste is not particularly successful, but paves the way for further regulation.

1848 - In Britain the Public Health Act 1848 begins the process of waste regulation.

1874 - The first "destructor" (prototype incineration plants which burnt mixed fuel producing steam to generate electricity) is designed and constructed in Nottingham.

1875 - The Public Health Act 1875 charges local authorities with the duty to arrange the removal and disposal of waste, replacing the previously widespread practice of scavenging.

1907 - An amendment to the Public Health Act 1875 extends refuse collection to include trade refuse and authorises local authorities to levy charges for waste collection.

1936 - The Public Health Act 1936. Authorities are given the power to prosecute over uncontrolled dumping, cesspools and scavenging - a practice which often resulted in the scattering of refuse.

1960s - Private waste contractors begin to take over in what had previously been considered a public works activity.

1974 - Increasing concern over waste leads to the Control of Pollution Act 1974 which aims for a much wider control of waste disposal and regulation of sites, and begins a serious tightening up of waste disposal methods.

1990 - The Government produces "This Common Inheritance", its first comprehensive White Paper on the Environment.

1996 - The Government publishes its waste strategy for England and Wales, entitled "Making Waste Work". This document sets out plans for sustainable management of waste, and also confirms the target of 25% of household waste to be recycled by the year 2000.

2000 - A finalised waste strategy for England and Wales - "Waste Strategy 2000" - is published, setting revised national targets for the recycling or composting of household waste: 25% by 2005, 30% by 2010, and 33% by 2015.

2002 - Waste Not Want Not, the Strategy Unit's report on Waste Strategy 2000, is published.

2005 - Defra Pro-environment social research programme initiated

2007 - Waste strategy for England published

2.3.7 Kick Against Indiscipline (KAI)

In November 2003, the Lagos state government launched a comprehensive environmental programme called Kick Against Indiscipline (KAI), which is set up primarily to supplement the drive to keep the streets of Lagos clean. An enforcement unit, the KAI brigade, comprising of trained 'street captains' assigned to specific parts of the state, is set up as the de facto enforcement arm of the state Ministry of environment charged with enforcing the state's environmental and sanitation laws.

The KAI programme is structured along the lines of the defunct national WAI programme which had been launched two decades earlier. The initiators of the programme also identify 'indiscipline' as the main cause of most of the environmental problems in the state; however, this programme does not include the financial rewards for cleanest areas as the WAI programme did, nor are local municipalities encouraged to compete for the title of cleanest local area. However, while WAI was a national programme enforced by the WAI police, KAI is a Lagos state programme enforced by the KAI brigade. Both programmes also incorporated social campaigns as part of their behavioural change strategies, with the ones initiated through the KAI programme having lesser impact.

2.3.8 Resource Recovery – The informal sector

The private, informal sector may be categorised as a non-governmental waste management 'agency' comprising of individuals, working on their own or in semi-organised cooperatives within the waste management system. Broadly speaking, the informal sector workers may be sub divided into three groups – those who get paid for waste collection services, those who do not get paid for waste collection services and those who pay for the right to collect waste from households.

Below is a list of informal sector groups categorised according to their operational structure.

Cart Pushers

This group operates door to door household waste collection services and are so called because they make use of hand drawn carts or, in some cases, tricycles to transport the waste for disposal. Typically, cart pushers are paid, through

negotiated fees, based on the volume and, in some cases, type of waste to be collected. Some cart pushers have to pay fees at dumpsites before they are allowed to dump their wastes, while some have been known to tip the collected wastes illegally into storm water drains and on illegal dumping sites. The cart pushers remain popular in Lagos, especially in the medium and lower income areas because of the prevalence of narrow, inaccessible roads which suit the small, easily manoeuvrable, hand drawn carts but present a significant obstacle to the much larger vehicles of the government licensed PSP operators. The low level of service to these areas by the PSP operators gives the cart pushers significant leverage in negotiating collection fees as well as securing their continued operational activities.

Itinerant Waste Buyers (IWB)

The IWBs, unlike the cart pushers, collect only clean, segregated recyclable materials from households. The local names given to the IWBs in Lagos are *Onigo* and *Alagolo*, literally meaning 'the one with the bottle' and 'the one with the metal can', respectively. They go from house to house to collect specific recyclable materials. It is not typical for IWBs to collect different types of materials, rather they specialise in particular materials and therefore it will be a common sight to see an IWB with a sack, or cart in some cases, filled with a particular type of material. The most usual materials collected by the IWBs are metal cans, glass bottles, PET bottles, newspaper and textiles. They most often pay to collect these materials, although some households, usually middle class, willingly give these segregated materials away for free. Again, like the cart pushers, they mostly operate in low and middle income neighbourhoods. Also, the fee paid to households is usually based on volume and quality of the segregated materials. The collected materials are traded with other agents within the informal recycling chain, either to sell to recycling middle-men or combined with other IWBs to sell directly to recycling industries.

Street Pickers

The street pickers operate without getting paid for their collection services. They derive income from the resource value of the recyclable material they pick off streets and in illegal dumps. Street pickers, like IWBs, collect recyclable materials exclusively. They are not general waste collectors like the cart pushers. Similarly,

they also sell their collected materials on to either recycling middle-men or directly to recycling industries through cooperative groups.

Dumpsite Scavengers

The dumpsite scavengers operate on both the legally approved waste landfill sites as well as the illegal dumpsites. This group sort the wastes that arrive at landfills and dumpsites for valuable materials to sell on to middle-men and recycling industries. Usually, dumpsite scavengers live close to the dumpsites and some reside within the dumpsites themselves (Adebola, 2006).

2.3.9 The legal position of the informal sector

The informal sector is a key stakeholder in the management of household waste in Lagos. Recent studies suggest they provide about 39% of the overall household waste collection service in Lagos (World Bank, 2006), particularly in areas not serviced or poorly serviced by the PSP operators. They increase the volume of recyclable material diverted from landfill through their operations, which is significant because the trade in recyclable materials financially supports a large number of Small and Medium scale Enterprises (SMEs) involved in the recycling industry in Nigeria. This diversion of materials that would otherwise have been collected, transported and disposed of through the PSP or other, un-environmentally friendly means (such as open burning) reduce the overall financial and environmental cost of waste management in Lagos. And finally, because their operations are primarily driven by the resource value inherent in the collected wastes, they save the government significant costs that would have been associated with the collection, transportation and disposal of the diverted wastes.

With these benefits, it would be logical to make a case for building on the benefits the informal sector provide within the waste management system as is done in Colombia, Brazil, the Philippines and India (Scheinberg et al, 2010). However, the main argument by the government against informal sector activities stems from alleged high rate of illegal disposal of wastes, mostly by the cart pushers, as well as the need for waste management operations in Lagos to project modernity – which the government implies to mean the use of modern technology – and therefore, carts, tricycles and the like have no place in this modern vision of

Lagos. To this end, the Lagos State Government included a clause (section 19) in the Environmental Sanitation Law (Lagos State Government, 2001) which states that

‘no person shall establish, carry on or run a private refuse [waste] collection outfit except such outfit is registered with the appropriate Local Government and licensed by the Ministry [of Environment]’

This clause effectively makes the operations of all informal sector waste operators illegal, as they are not registered by the government to collect wastes, neither are they eligible to do so because they do not currently meet the criteria to apply as a private waste operator. The potential impact that the absence of the informal sector would cause to the waste management system would be severe and could possibly lead to the collapse of an already burdened system.

2.4 Summary and Conclusion – Waste Policy framework in Lagos

A historical look at the waste management drivers and techniques implemented in Lagos from 1851 to date reveals a heavy reliance towards short-term ‘fixes’ for what has been shown to be a long term issue.

The foundations of waste management policy instruments have been shown to be based on time specific needs and biased towards improving service provision primarily for the more affluent parts of the state, a legacy that subsequent governments have struggled to overturn. Also, there is historical evidence of a reliance on punitive action to address anti-environmental behaviour as opposed to efforts towards encouraging pro-environmental behaviour. Furthermore, most policies and waste strategies have been reactive rather than proactive and have not been set up to prevent future waste management issues.

This historical account shows that there has not been any significant effort made at incorporating evidence based policy approach to household waste management. Also, end users (households) have not been given the platform to have input in the policy formulation process.

In conclusion, it would appear that, over the last century and a half, most of the interventions by the government in addressing the issues of household waste management in Lagos, through the adoption of legal instruments, technical fixes in the form of equipment provision and the various social campaigns to change

behaviour have had minimal levels of success. This presents a challenge to Lagos state, as with other developing countries, where past and current waste management strategies have not been able to steer the management of waste towards the path of sustainability.

In summary, the pertinent question, based on the historical evidence of waste management interventions is 'if the interventions – technical, legal, economical and social – have not proven to be the solutions to the waste management problem in Lagos, what then could?'

CHAPTER 3. MEASURING HUMAN ATTITUDES AND BEHAVIOUR – A LITERATURE REVIEW

3.1 Introduction

Why do we act the way we do? What factors influence our behaviour? Is behaviour a rational choice and, therefore, can [(our actions) or (it)] be predicted when modelled in hypothetical and real scenarios? Historically, these questions have been debated and, until recently, confined within the fields of Psychology and Sociology (Kollmuss and Agyeman, 2002).

The relationship between attitude and behaviour is neither simple nor direct. Oskamp, (1991) explains that the link between them is a continuous and reciprocal process where attitudes aid the expression of behaviour towards an object or person and behaviour helps to test and shape the formation of attitudes.

3.2 Definition of attitudes

Definitions of what may be termed as 'attitude' vary and are sometimes controversial. There is still no unanimously acceptable definition of this concept, in fact, the concept of 'attitudes' is "characterised by an embarrassing degree of ambiguity and confusion" (Fishbein and Ajzen, 1975) though there is general agreement as to what its constituents are. Historically, the study of attitudes and variations in definition stems from its origins in the fields of Psychology and Sociology. The original set(s) of definitions relied heavily on contextualising attitudes in explaining the differences in individual human behaviour (Liska, 1975). Early definitions of what could be defined as 'attitude' range from "...a state of mind of an individual towards an object" (Thomas and Znaniecki, 1918) to "a mental or neural state of readiness, organized through experience, exerting a directive or dynamic influence on the individual's response to all objects and situations to which it is related" (Allport, 1935) to a more recent definition which defines attitudes as "A psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour" (Eagly and Chaiken, 1993). Allport's definition highlights key components of attitudes: Attitudes are private and they are also formed and organized through personal experience. This implies that no one is born with prefixed or predetermined attitudes, they are

acquired via the process of socialisation and attitudes are not passive, but rather they exert a dynamic or directive influence on human behaviour. Allport's definition is based on the premise that attitudes directly influence behaviour. Allport, (1954) has a second and more famous definition of attitudes. Here, he states that an attitude is "A learned predisposition to think, feel and behave toward a person (or object) in a particular way". This definition reinforces the earlier position that attitudes are acquired in some form or way and from the period of acquisition, begin to influence thoughts, feelings and behaviour.

3.2.1 Components of attitudes

Spooncer, (1992) describes attitudes as being composed of three main components: Affective (based on emotional feelings), cognitive (based on beliefs held) and behavioural (predispositions to act in certain ways). All these components are targeted towards an object - animate or otherwise - that triggers an attitudinal response. A graphic representation of these components in relation to the formation of attitudes is given in Figure 3.1.

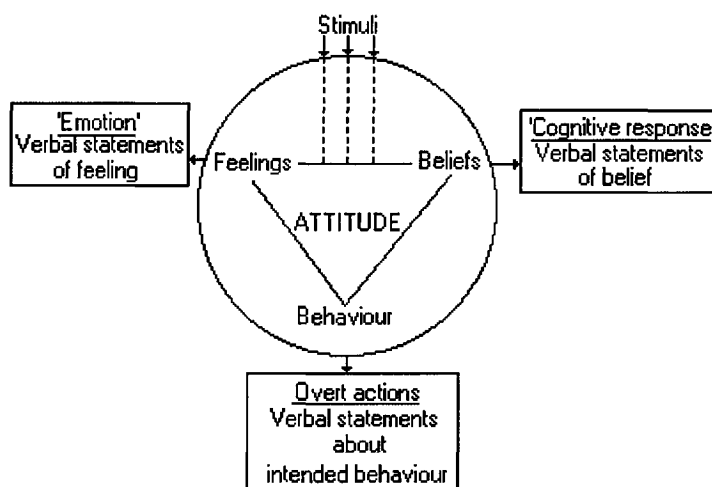


Figure 3.1 Components of attitudes. (Spooncer 1992)

A similar classification is given by Baron and Byrne (1984), in their definition of attitudes as "relatively lasting clusters of feelings, beliefs, and behaviour tendencies directed towards specific persons, ideas, objects or groups". The common theme between the works of Spooncer and Baron and Byrne is the agreement that attitudes are composed of feelings (affective), beliefs (cognitive) and behavioural aspects.

A hypothetical scenario (attitudes to plastic bottles reuse) is shown below to highlight the exhibition of these three components.

Table 3.1 Negative attitudes to plastic bottles reuse (hypothetical)

| | |
|-------------|--|
| Affective | I don't like reusing plastic bottles |
| Cognitive | Reusing plastic containers is socially 'uncool' |
| Behavioural | I do not reuse plastics because I would rather buy new ones all the time |

Erwin, (2001) explains that the three components come into play when demonstrated as thus: "if we like (or dislike) something or someone (*affect*), we tend to think positively (or negatively) about it or them (*cognition*) and are likely to either seek or avoid contact with it or them (*behaviour*).

Other social concepts closely related to attitudes are values, beliefs, opinions and habits. These concepts, though similar to that of attitudes, are not synonymous with it in definition. Values are objects of attitude and they influence attitudes. Beliefs are the agglomeration of the cognitive thoughts and ideas attached to attitudes. Opinions are very similar in meaning to attitudes as well as beliefs, but they usually have a narrower scope and do not contain the emotional component of attitudes (Oskamp, 1991).

3.2.2 Attitude formation

Social scientists and researchers agree that one of the intrinsic qualities of attitudes is that they are formed over time (Allport, 1935) and no one is born with a fixed set of attitudes. Oskamp, (1991) mentions genetic and physiological factors, direct personal experience, parental influence, group determinants and the mass media as factors that guide and mould the formation of attitudes.

Genetic and physiological factors

Some arguments have been made, through research and anecdotal evidence, that there is a link, however minimal, between inherent human genetic makeup

and attitude exhibition (Erwin, 2001). Erwin draws on past research that highlighted the evidence of 'shared' attitudes in case studies involving attitudes of genetically similar twins while being mindful of not alluding to attitudes being inherent. Research has shown that there certainly is a valid case for arguing that genetics plays a role in attitude formation. The degree to which this is valid remains inconclusive. Physiological factors, on the other hand, influence attitude formation through physiological conditions, for example, a partially sighted person's attitude towards using a white stick.

Direct personal experience

Personal experience with the object – or person – that the attitude is expressed towards may be critical in determining which set or sets of attitudes are formed. Oskamp, (1991) describes salient incidents and repeated exposure as two categories of personal experience that are important in forming attitudes. Salient incidents may be in the form of 'strong, impressionable incidents' for example, being involved in a car accident while the driver was over the legal speed limit. Repeated exposure could be in the form of e.g. becoming loyal to a product brand through contact with its commercial advertising campaign through various media over a period of time.

Parental influence

Culturally, parents serve as the primary role models to their children before secondary sources like school and exposure to media influences their attitudes. The importance of parental influence on children's attitudes cannot be dismissed easily, especially in societies, like those that exist in Nigeria, where there are strong family ties and set social structures.

Group determinants

Peer groups have been shown to be highly influential in attitude formation in individuals and in groups (Oskamp, 1991). Peers are able to act as information 'reinforcers' by strengthening already held beliefs and existing attitudes. Oskamp, (1991) also highlighted the importance of institutions, particularly schools, as being second only to parents in determining students' attitudes in general.

Mass media

Information sources through various media, like print, radio, television and the internet influence how attitudes are formed (Brescoll and LaFrance, 2004; Yang 2004).

In summary, it may be concluded that attitudes are transient, in that they are susceptible to change depending on the nature and strength of the influencing factors.

3.3 Public participation in waste management policy

Historically, waste management policy development has largely evolved without significant input from the public. Recent research has however suggested the involvement of the public in environmental policy-making as a way of developing citizen empowerment, increasing social responsibility and enhancing institutional legitimacy (Fahy, 2006). The participation of the public in the formulation of environmental policy was given prominence through one of the action points agreed at the Rio Earth Summit in 1992 (UN, 1993), which stated that

33.8. All countries should assess how to translate Agenda 21 into national policies and programmes through a process that will integrate environment and development considerations. National and local priorities should be established by means that include public participation and community involvement, promoting equal opportunity for men and women.

Macnaghten and Jacobs (1997) define public participation, within the context of environmental policy, as 'the involvement of ordinary citizens in both decisions about and the implementations of social and economic change'. They also discuss how the emphasis on public participation, within the sustainability debate, has two sources, value based and instrumental. The value based view of public participation, according to Macnaghten and Jacobs (1997) sees participation as an end in itself. Agenda 21 argues that only if ordinary members of the community, particularly those in disadvantaged groups, take part in decision making processes can the outcomes of those processes be regarded as good. The second source of public participation within the sustainability discourse is

instrumental. The success of the necessary social and economic changes needed to achieve sustainability depends largely on the ability of the public to change their lifestyles and behaviour into more sustainable patterns. The public can contribute to a sustainable society in at least two ways. First, they can participate directly in pro-environmental activities such as recycling, resource reuse and carbon offsetting or indirectly, through participating in consultative processes on public policy issues which may lead to political support for sustainability policies (Macnaghten and Jacobs, 1997).

Scheinberg et al (2010) advance the discussion on stakeholders' involvement in waste management policy beyond participation and consultation, by introducing the concept of inclusivity as one of the delivery strategies within the ISWM framework. Inclusivity involves the complete immersion of stakeholders into the entire waste management process, from conception to delivery and review.

3.4 Modelling environmental attitudes and actions

3.4.1 Linear (information deficit) models

Burgess et al (1998), in their review of the early theories that sought to explain attitude formation highlighted that these early theories hypothesised that there was a linear cause and effect relationship between environmental knowledge, attitude formation and the consequential environmental behaviour. It was theorised that the acquisition of environmental knowledge would lead to environmental awareness and concern and this would ultimately lead to positive environmental behaviour or vice versa. These models also assumed that people were rational in how they accessed, processed and acted upon environmental knowledge and were termed the information deficit models of public understanding and action by Burgess et al (1998).

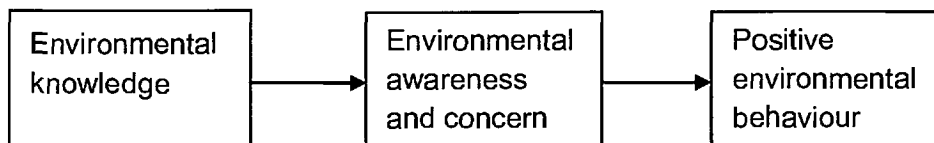


Figure 3.2 Linear (Information deficit) models explaining environmental behaviour

Source : Kollmuss and Agyeman, 2002

Research into the factors that influence behaviour, however, has shown that the links between information acquisition and environmental behaviour are not as linear as previously postulated, neither is man's environmental behaviour always rational (Stern et al, 1993). It has been shown that increase in knowledge and awareness does not necessarily lead to pro-environmental behaviour (Kollmuss and Agyeman, 2002); also, information (knowledge) is not the only factor that influences environmental behaviour, leading researchers to conclude that there is a disparity between attitudes and actions, this is known as the value – action gap in environmental behaviour (Blake, 1999). Hines et al (1987) for example describe other factors, like psychological factors, and social factors such as locus of control, personal responsibility and action skills to perform environmentally related actions, as having influence on eventual environmental behaviour.

The consensus in social research at this point was that there were other factors in play when identifying the influences of environmental behaviour. Also, there appeared to be a gap between environmental knowledge and actions since it had been shown that access to information did not necessarily lead to pro-environmental behaviour. Rajecki (1982) as cited in Kollmuss and Agyeman (2002) identified four reasons that may explain why a person's reported attitudes may differ from their environmental behaviour: Experience, normative influences, temporal discrepancy and attitude-behaviour measurement.

- a) Experience: It was Rajecki's (1982) opinion that the more direct an experience affects an individual, the stronger its impact on their behaviour. For example the behaviour towards the use of domestic water treatment between a person who has previously been infected with cholera as opposed to another person who has only read about the risk of cholera infection from posters.
- b) Normative Influences: Rajecki (1982) also explained that attitudes were a function of an individual's culture comprising of, but not limited to, social norms, religion and family customs. Kollmuss and Agyeman (2002) state that if the dominant cultural controls encourage a lifestyle

that is unsustainable, pro-environmental behaviour is less likely to occur and the gap between attitude and behaviour will widen.

- c) Temporal Discrepancy: Rajecki (1982) believed that the time lapse between the main motivator driving action and eventual environmental behaviour was also a significant factor. Kollmuss and Agyeman use the example of a national Swiss memorandum that narrowly passed through enforcing a 10 year halt to building any new nuclear reactors in Switzerland. What was surprising about this result was that just two years earlier, in the wake of the Chernobyl nuclear reactor disaster, data showed that the majority of Swiss people were opposed to nuclear energy.
- d) Attitude Behaviour Measurement: Finally, Rajecki (1982) also suggested that the method of measuring attitudes and behaviour themselves may lead to the gap as generally, the attitudes measured are much broader in scope than the measured actions. For example, are you concerned about the environment (attitude) and do you burn your domestic waste (action). There may be other mitigating factors that would make a pro-environmental individual engage in the burning of waste.

Fishbein and Ajzen (1975) introduced the Theory of Reasoned Action (TRA) in an effort to resolve these difficulties in measuring and comparing attitudes and behaviour. The TRA was developed to predict behavioural intention and not actual behaviour itself. This was put in use in the United States of America (USA) to predict public political preferences during elections. It introduced the concept of behavioural intention as the precursor to actual behaviour and also assumed that attitudes and subjective norms were the only two predictors of behavioural intention (Fishbein and Ajzen, 1975) (Figure 3.3).

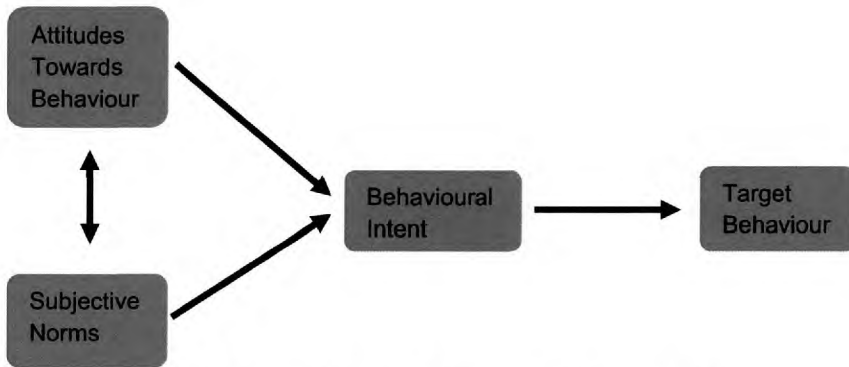


Figure 3.3 Theory of Reasoned Action (Fishbein and Ajzen, 1975)

Ajzen and Fishbein (1980) defined attitude towards the behaviour as “a person’s general feeling of favourableness or unfavourableness for that behaviour”, while they defined subjective norm as a person’s “perception that most people who are important to him think he should or should not perform the behaviour in question”.

Subsequent research into behavioural modelling highlighted that there were other factors that came into play in determining environmental behaviour, regardless of beliefs, attitudes or intentions of the individual (Sheppard et al, 1988; Blake, 1999). In addition to this, the underlying assumption of the TRA that individuals ‘make systematic use of information available to them’ (Ajzen and Fishbein, 1980) was shown not to be the case and this made the prediction of behaviour based on the TRA difficult.

In response to these drawbacks of the TRA model, the Theory of Planned Behaviour (TpB) was developed. It is a model that evolved from the earlier TRA model to include the concept of perceived behavioural control to predict behavioural intent and behaviour (Figure 3.4). Perceived behavioural control refers to “people’s perception of the ease or difficulty of performing the behaviour of interest” (Ajzen, 1991).

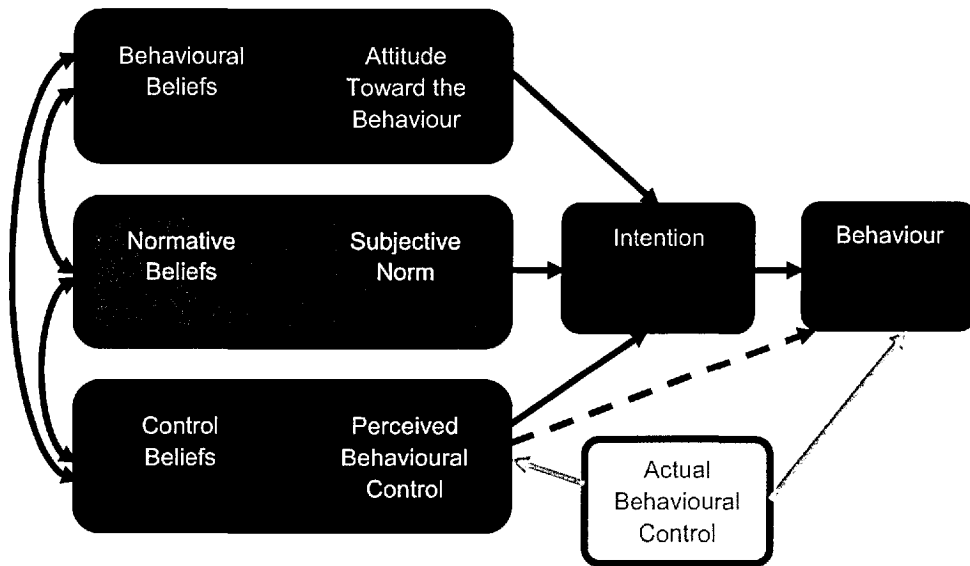


Figure 3.4 TpB Model (Ajzen, 2006)

Source: <http://people.umass.edu/aizen/tpb.diag.html>

The TpB model, accommodates for predicting behaviour in situations where individuals may not have complete control over their behaviour and will therefore require access to resources to enable them to act in a certain way. Since an individual's perception of a situation is their personal view of 'reality', the perception of their ability to access the required resources to behave in a certain way will have an influence on their intention towards the behaviour and consequently, the performance of the behaviour. Kollmuss and Agyeman, (2002) attribute the strong influence the TRA and TpB attitude-behaviour models have had in social psychology to their simplicity as well as their expressions as mathematical equations, which easily render themselves to empirical studies.

3.4.2 Socio - Psychological models

Fietkau and Kessel's (1981) (in Kollmuss and Agyeman, 2002) model of ecological behaviour represents a departure from the linear frameworks presented by psychology researchers. They present a model, which comprises of 5 independent variables.

- Attitude and values.
- Possibilities to act ecologically. These are external, infrastructural and economic factors that enable or hinder people to act ecologically.

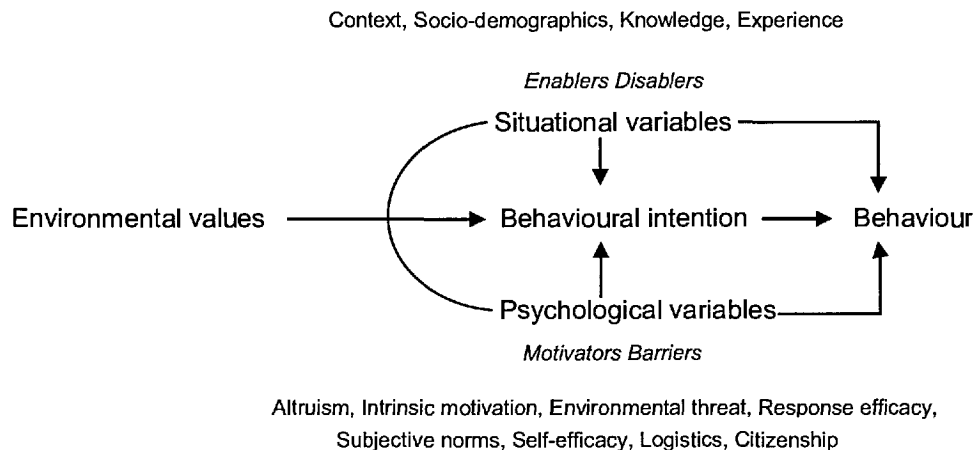


Figure 3.5 Framework for understanding attitudes (Barr, 2001)

- Behavioural incentives. These are more internal factors that can reinforce and support ecological behaviour (e.g. social desirability, quality of life, monetary savings).
- Perceived feedback about ecological behaviour. A person has to receive a positive reinforcement to continue a certain ecological behaviour. This feedback can be intrinsic (e.g. satisfaction of 'doing the right thing'), or extrinsic (e.g. social: not littering or recycling are socially desirable actions; and economic: receiving money for collected bottles).
- Knowledge. In Fietkau's model, knowledge does not directly influence behaviour but acts as a modifier of attitudes and values.

These variables, which may be influenced and changed, utilise sociological as well as psychological factors to explain environmental behaviour of individuals (Kollmuss and Agyeman, 2002).

Barr (2001) utilises the core of Fishbein and Ajzen's (1975) TRA model describing the relationship between behaviour and intention to develop a framework for understanding the public's attitude to waste management – specifically, recycling behaviour. Barr's model, however, departs from the rigid linear framework of the TRA and TpB models with the introduction of factors which may be used to predict waste management behaviour. He describes the three groups of variables which are likely to influence waste behavioural intention as: environmental values, psychological variables and situational variables (Figure 3.5). Barr's model utilises quantitative investigation techniques, because, it is argued that such methodologies continue to offer an appropriate means by

which to examine waste management behaviour within the United Kingdom. The use of quantitative techniques in this model also serves to test the efficacy of the three categories of variables that have been identified as predictors of behaviour as well as testing the degree to which each predictor influences behaviour (Barr, 2001). Barr asserts that the quantitative nature of the model and its output enables researchers to investigate further the gap between environmental behaviour and action, known as the value-action gap and also provides a useful reference tool for policymakers.

Blake's (1999) model showed that pro-environmental inaction by was not down to information deficit or a lack of rationality by individuals; rather it was due to obstacles that exist between the sphere of environmental concern and environmental action. The first obstacle, individuality, is described within social psychology as personal attitudes or cognitive structure and this group of obstacles is relevant for people whose environmental attitudes are peripheral within their wider attitudinal structure and whose conflicting attitudes outweigh their environmental concerns. A good example of this is apathy. The second obstacle, responsibility, focuses more on the way social or external factors influence an individual's evaluation of the potential consequences of specific environmental actions (Fishbein & Ajzen, 1975). This may be highlighted in situations where despite positive environmental values and attitudes, an individual decides not to act in a pro-environmental way because he / she does not feel that their individual action amounts to any significant impact in the larger scheme of things. The final obstacle, practicality, is described as the social or institutional constraints which may prevent an individual from adopting pro-environmental behaviour, regardless of their attitudes or intentions.

Type of Barrier

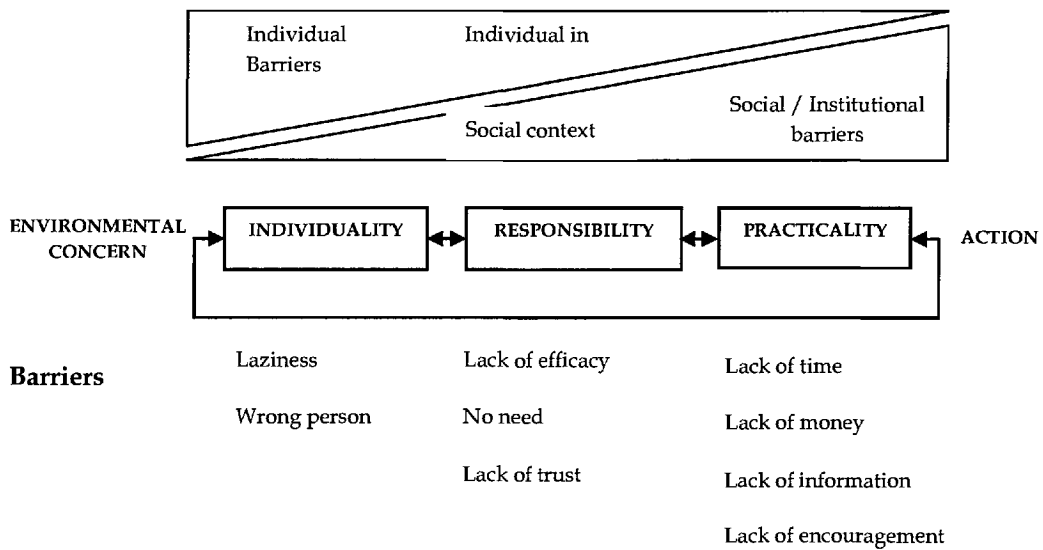


Figure 3.6 Barriers between environmental concern and action (Blake, 1999)

Blake explained that while the earlier models were useful in exploring the complex relationships between different people's beliefs, attitudes, intentions and actions, they often fail to incorporate structural and institutional arrangements that enable or constrain individual environmental action (Blake, 1999). Also, while the earlier models, particularly the TpB and TRA models, were more suited for quantitative studies, Blake's model focused more on qualitative and contextualised investigations into how individuals formed their views and opinions on the environment in their dynamic social settings. Research has shown that individuals do not permanently hold fixed sets of values and views, rather, their views and opinions are fluid and vary over time and space and are sometimes contradictory (Blake 1999; Guerrier et al., 1995).

Kollmuss and Agyeman (2002) argue that developing a single model to explain or describe human behaviour might neither be feasible nor useful. They suggest that modelling factors that shape environmental behaviour is such a complex task that it cannot be visualised in a single framework or diagram. They use the absence of a clear, definitive model or theory explaining the value-action gap to validate their conclusions.

Kollmuss and Agyeman, however, also propose a model, based on Fliegenschnee and Schelakovsky (1988) to explain environmental behaviour in

terms of the barriers which exist in preventing pro-environmental behaviour and broadly describe the variables that influence behaviour under internal and external factors (see Figure 3.8).

They give examples of: motivation, environmental knowledge, values, attitudes, environmental awareness, emotional involvement, locus of control and responsibility and priorities as the variables which make up internal factors. They also categorise the variables that make up external factors to include: institutional factors, economic factors and socio-cultural factors.

Kollmuss and Agyeman state that the distinctions between the factors which influence behaviour as highlighted in their model are to some extent arbitrary. They explain that the reason behind this is that most of the variables are broad and vaguely defined and are, in some cases, interrelated and have no clear boundaries (Kollmuss and Agyeman, 2002).

3.5 Attitude and behaviour research in waste management

Efforts to model human behaviour in waste management are relatively new and remain largely in the scope and context of developed countries, and have focused mainly on waste minimisation, reuse and recycling behaviour, e.g. in the UK (Blake, 1999; Barr, 2002; Fahy, 2006). From these studies, different sets of variables have been used to explain household waste management behaviour (see Table 3.2). Fahy (2006) expands on the earlier studies of Blake (1999) and Barr (2002) by developing a different classification of household waste behaviour under personal, demographic, practical and contextual variables, and concedes that the examples under each variable are flexible and not definitive as they have the potential to be grouped into more than one category.

Table 3.2 Selected classifications of variables influencing waste management behaviour

| <i>Researcher</i> | <i>Year</i> | <i>Identified Variables</i> |
|----------------------|-------------|--|
| Fahy | 2006 | Personal, Demographic, Practical, Contextual |
| Barr | 2002 | Environmental Values, Situational factors, Psychological variables |
| Kollmuss and Agyeman | 2002 | Internal, External |
| Blake | 1999 | Individuality, Responsibility, Practicality |

Kollmuss and Agyeman's model of categorising behavioural variables into internal and external factors provides a useful and easily presentable framework

for assessing waste management behaviour. Most behavioural models are subjective to the extent that some variables may not easily be classified under one category (Blake, 1999). Therefore, a 'simpler' framework which broadly groups environmental behaviour under internal and external factors, albeit at the expense of demographic factors, has been chosen for use in this thesis. This serves the direct purpose of categorising and discussing the barriers to pro-environmental behaviour with the aim of developing policy suggestions, which is the main aim of this study.

3.6 Behavioural interventions

The success of waste management policy interventions may be measured in the context of human behaviour and the extent of behaviour change. Behaviour change has been recognised as a crucial element of successful policy interventions in developed countries, particularly in the UK where the Government's Sustainable Development Strategy (DEFRA, 2005) advocates behaviour change given that individuals are responsible for many of the most significant environmental impacts (Darnton, 2008).

Social marketing, defined by the National Social Marketing Centre (NSMC) in the UK, is the systematic application of marketing, alongside other concepts and techniques, to achieve specific behaviour goals for a social or public good (French and Blair Stevens, 2006). Social marketing is a conduit for behavioural change. It enables a systematic and balanced approach to policy development which recognises the 'end user' and their interaction with their environment, including the social, environmental, technological and economic contexts. In the absence of social marketing, policy focus is limited and skewed towards technological and economic solutions only. Which was observed in the historical review of waste management interventions in Lagos, and is also common in developing countries

Social marketing has been practised extensively in Canada, the United States of America (USA), New Zealand and Australia. In the UK, social marketing techniques were used to a certain extent by the voluntary sector for a number of years, but more recently have become successfully developed and embedded into public policy and its implementation. It is used by governments to address a

range of issues including smoking, sexual health, community development, healthy living, climate change and waste prevention (DEFRA, 2006).

Social marketing aims to build collaborative approaches between the public, private and the voluntary sector. Whilst government is best placed to 'enable' change other stakeholders, such as businesses and the public, have a vital role in supporting and delivering change. Social marketing decisions are based on obtaining deep 'insight' through a mix of research techniques such as surveys, focus groups and observations. The aim is to understand the barriers and benefits to change; to ensure the behaviour goal fully addresses the existing behaviour; to ensure the behaviour change is maintained and supported over a sustained period of time; and that preventative measures are included to avoid others taking up the behaviour. The key elements of social marketing include insight, segmentation, the use of applied theory, understanding of the competing forces and the exchange between benefits and barriers, design of the marketing mix, and measurement and evaluation. The resulting social marketing strategy will ensure that services, facilities and training are provided to enable and support change (DEFRA, 2006).

McKenzie-Mohr (2000) introduces the concept of community-based social marketing as an alternative to social campaigns based on the information deficit model. Community-based social marketing is composed of four stages:

- a) Uncovering barriers to behaviours and selecting which behaviour to promote
- b) Designing a programme to overcome the barriers to the selected behaviour
- c) Piloting the programme and;
- d) Evaluating it once it is broadly implemented.

McKenzie-Mohr (2000) explains that while the first step in social marketing, uncovering barriers to behaviours (barrier research), is critical in the successful design of interventions, there have been cases where this step has been omitted, owing to a variety of reasons, including: the errors made by policy makers of forming personal theories that assume the barriers to certain behaviours are already well known, time constraints to deliver interventions within a short period

of time, and financial constraints that make additional work difficult to justify (McKenzie-Mohr, 2000).

McKenzie-Mohr (2000), further highlights that while conducting barrier research will add significantly to the length of time and cost required to deliver social marketing interventions, these additions are likely to pale, however, compared to the time and cost of redelivering a programme because the first attempt failed to change behaviour.

3.6.1 The 4 Es of Behaviour Change

The evidence from research into factors which determine behaviour patterns forms the foundations of the UK Government's approach to behaviour change. This focuses on measures to enable and encourage behaviour change, measures to engage people, and ways in which the Government can lead by example, often known as the '4 Es' (Figure 3.7).

The 4 Es of behaviour change were designed in accordance with social marketing principles, specifically to promote pro-environmental behaviour (DEFRA, 2008), but have been applied in other fields (Darnton, 2008). Each of the Es is mapped against intervention types. Thus Enable relates to core infrastructure, Encourage to fiscal, legislative and regulatory measures, Engage to communications, and Exemplify to government demonstrating its commitment to the behaviour in question (Darnton, 2008).

Darnton, 2008 highlights that while the 4Es model provides a valuable framework for policy makers in developing interventions, it is not a behavioural model and, therefore, does not help predict how individuals will react in response to the policy which is designed. Factors omitted from the model include societal influences on behaviour such as socio-psychological factors, market forces, and the (often contradictory) influence of other, sometimes conflicting, government policies. Darnton, 2008, therefore proposes the use of other relevant behavioural models alongside the 4Es model to determine which policy instruments were most likely to achieve an effective balance (Darnton, 2008).

**Approach evolves
as attitudes and
behaviours change
over time**

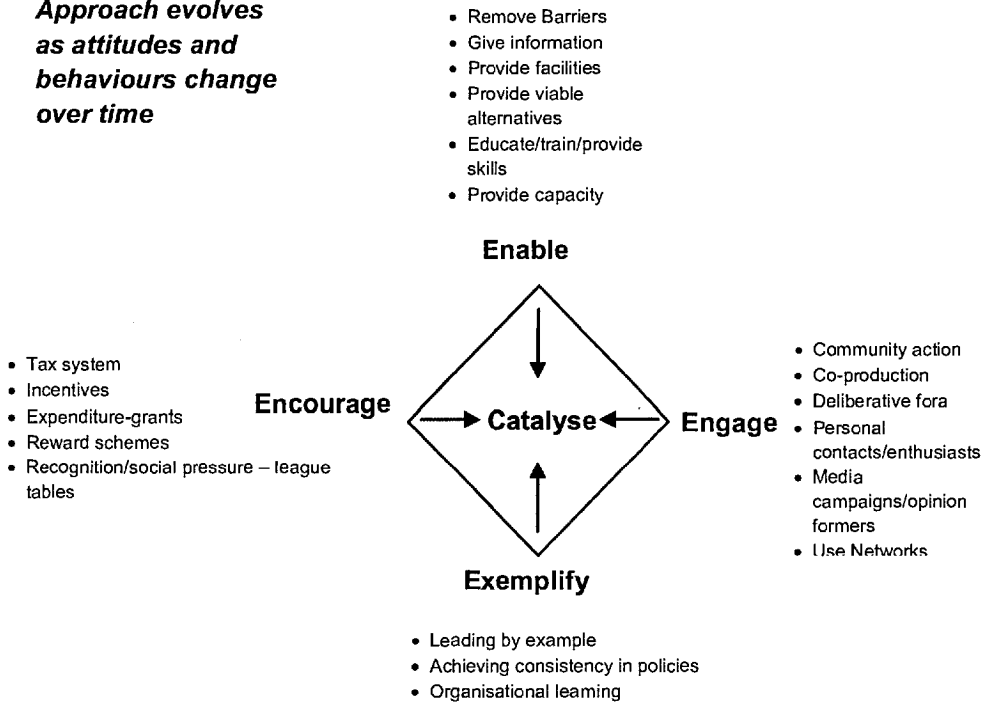


Figure 3.7 DEFRA 4 Es approach of influencing behaviour change

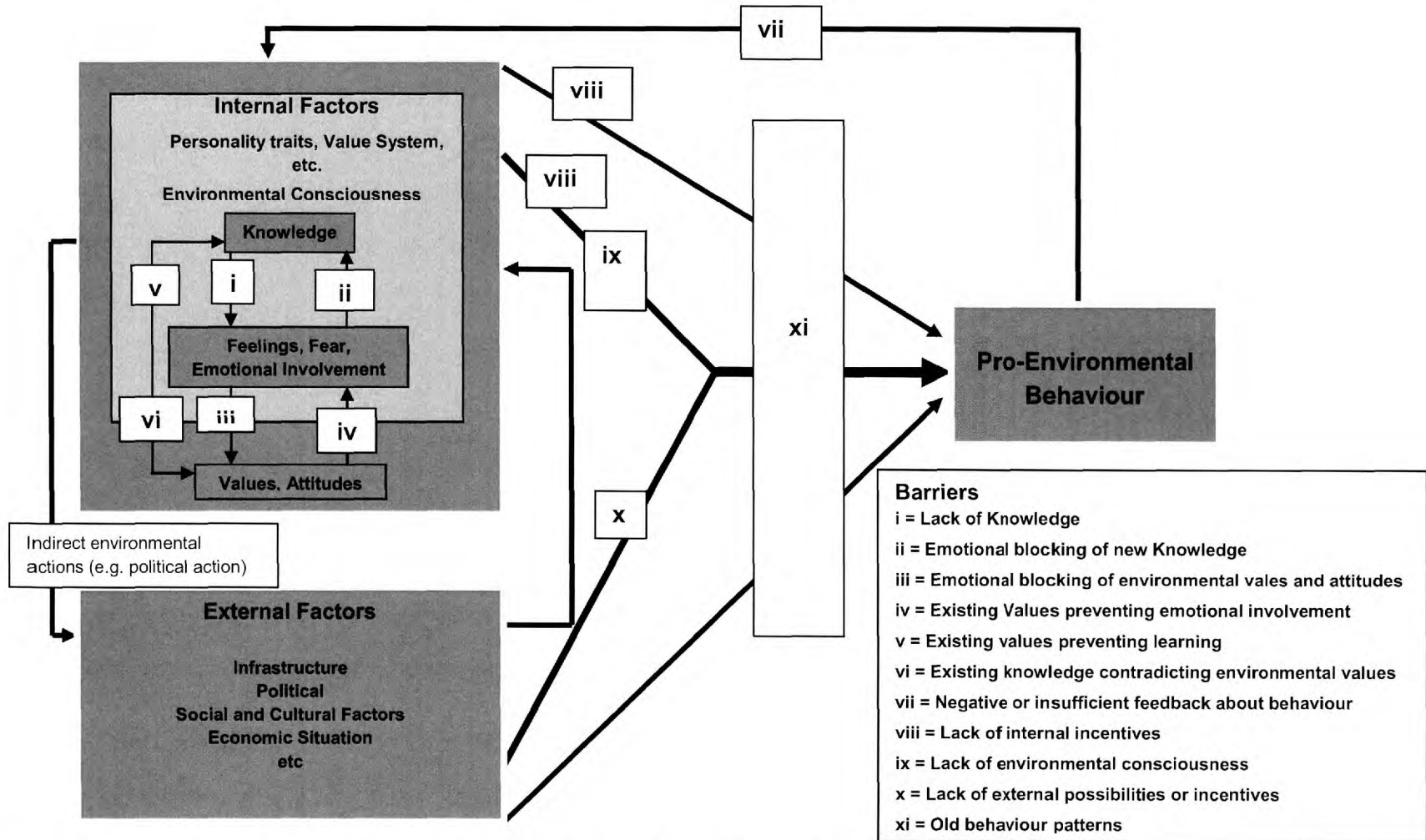


Figure 3.8: Conceptual framework of Pro-Environmental Behaviour (adapted from Kollmuss and Agyeman, 2002)

CHAPTER 4. OVERVIEW OF THE RESEARCH PROCESS

4.1 Introduction

This chapter outlines the methodologies adopted to achieve the research objectives listed in Chapter 1 and also addresses certain limitations and ethical decisions involved in conducting the research project.

Householders are active stakeholders in the waste management system in Lagos and their impact is far reaching. Their environmental behaviour, which may be perceived as neutral, pro-environmental or anti-environmental, is influenced by various factors. The success of any governmental strategy, policy or programme to encourage pro-environmental behaviour hinges on the understanding of the factors that influence current environmental behaviour. It is the understanding of these behavioural factors that underpins the design and development of effective strategies and policy instruments.

The methodology presented below investigates the research question of whether the neglect of households and their attitudes towards waste management from the formulation of waste management policy has contributed to the failure of the waste management systems. The following sections detail the chosen methodologies and discuss some issues that arose from them.

4.2 The Research Methodology

The research relied on both quantitative and qualitative methodologies in achieving the research objectives. Quantitative methods for investigating attitudes and behaviour have numerous benefits. Since they are numerical, and generally structured, their results may be quantified and analysed using numerous statistical techniques (Kitchen and Tate 2000). The results from quantitative studies may also be cross compared with different sets of data of similar structure. Historically, as was shown in Chapter 3, pioneering research into attitudes in the field of psychology relied heavily on quantitative approaches to measure attitudes and behaviour.

Recent studies into attitudes and behaviour, however, have shown that the utilisation of merely descriptive, quantitative data is inadequate if the goal of research is to understand the underlying reasons for the stated attitude or behaviour. Quantitative research methods answer the 'What' questions efficiently (for example: what waste disposal methods do you use?). 'What' questions can elucidate the situation on the ground at the time the data were collected, but what they do not answer are the 'Why' questions (for example: why do you use Cart Pushers as opposed to Private Sector Waste Collectors (PSP)?). These questions are more contextual and cannot easily be asked within a quantitative framework where response options are limited.

It is for this reason that modern research methods have incorporated qualitative data collection methodologies and techniques so as to better understand responses to not just the 'What' questions, but also the 'Why' questions as well. It is therefore important to note that while there is a place for quantitative techniques in the study of attitudes and behaviour, in the identification of environmental issues and the confirmation of opinions towards the environment, they are less effective in examining the reasoning behind stated opinions or existence of environmental issues. Less structured qualitative techniques in the investigation of the reasons why certain attitudes or behaviours are expressed has gained increasing acceptance in modern social sciences, especially in relation to the study of environmental attitudes and behaviour (Kitchen and Tate, 2000; Burgess et al 1998; Blake 1999 and Barr, 2006). The main criticisms of qualitative techniques are those concerning their dependence on non-representative small samples which render them incapable of producing statistically generalised conclusions (Hamel et al 1993) and in cases where such generalisations are made, the integrity of the research is questioned (Onwuegbuzie and Leech, 2009).

Bryman and Cramer (2001) suggest a synergy of both qualitative and quantitative techniques in investigating social phenomena. Seale (1999) explains that quantitative techniques could be used to validate the findings of qualitative studies and also the inclusion of quantitative techniques in a qualitative study may to some extent answer the issue of generalisation, which is a major criticism of qualitative techniques.

This study utilised a two phase, dominant – less dominant research method (Creswell, 1994) where both quantitative and qualitative research techniques involving the use of questionnaires, focus groups and interviews were deployed. The first survey phase had a dominant quantitative component with a less dominant qualitative interview component, while the second survey phase had a dominant qualitative, focus group component and a less dominant, questionnaire component (see figure 4.1) which was used to validate the findings of the results in the first phase.

The aim of this approach was to draw on the inherent strengths of each research methodology and accommodate for deficiencies through the use of multiple techniques. The data produced represent a robust array of information which provides insight into the quantitative and qualitative understanding of household attitudes to waste management issues in Lagos.

A significant output from the survey techniques used in this research is the production of the first quantitative and qualitative baseline information on reported household attitudes and behaviour of residents of Lagos to waste management issues. This marks the first attempt by any research to produce such a body of work as no prior data exist in this respect. The quantitative data were gathered using face-to-face questionnaire administration and this limited, to a large extent, the potential exclusion of certain groups of people, for example, visually impaired, functionally illiterate or physically challenged individuals who would have otherwise been marginalised through the use of other less direct forms of questionnaire administration, for example, telephone, drop-box and collection method.

4.3 The Fieldwork Methodology

The research was made up of three main activities:

- The initial Desktop Study
- The Questionnaire Survey conducted in the summer of 2007 and;
- The Focus Group Discussions conducted in the summer of 2008

The figure below (4.1) outlines the entire fieldwork process. It depicts the methodological flow of activities involved in the research and how each activity

served as the foundation for the next one. The following section discusses the fieldwork process.

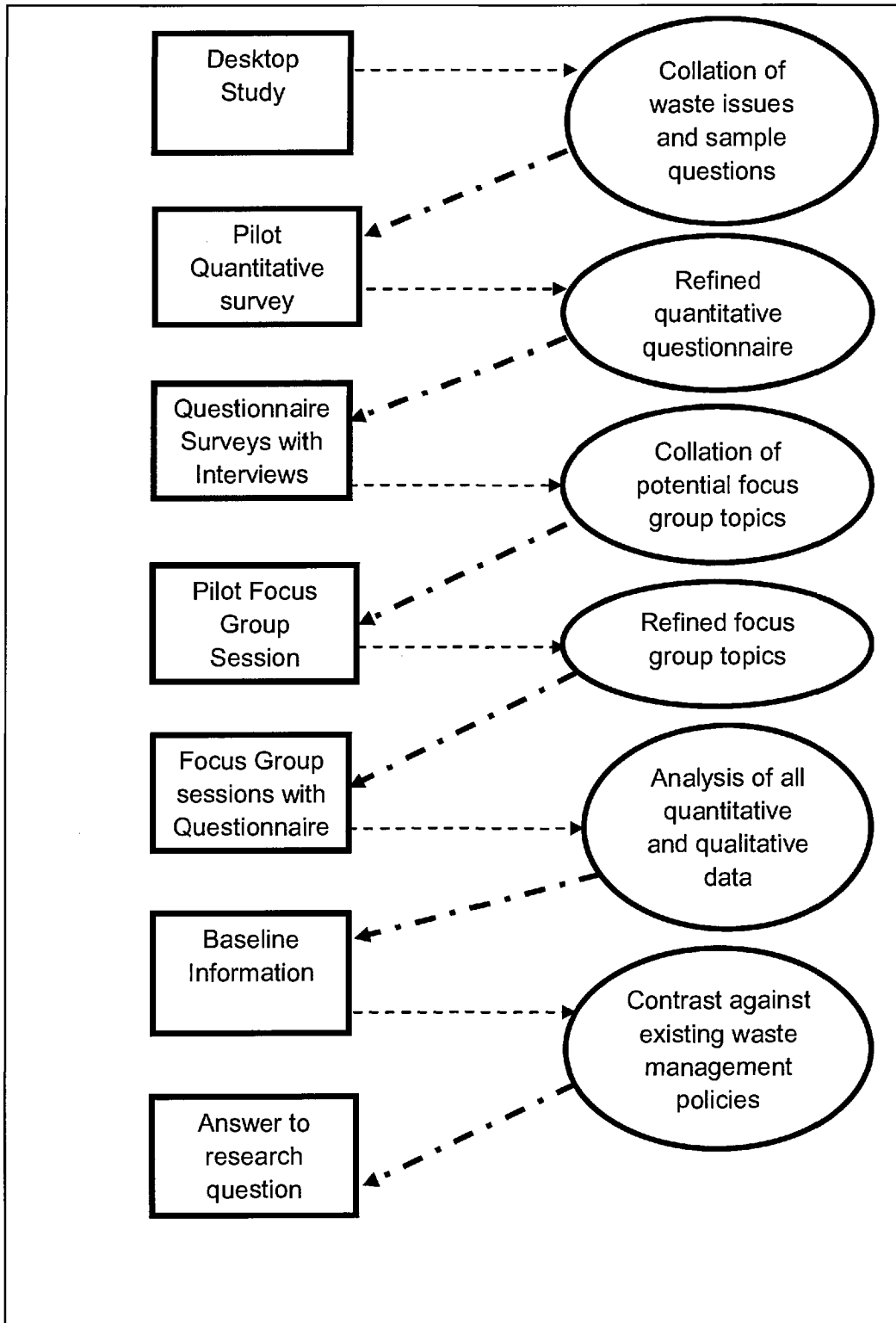


Figure 4.1 Research Process

4.4 Desktop Study

The first step of the research process was the desktop study of previous and current waste management plans and policies in Lagos. The aim of this activity was to collate and plot a historical timeline of plans and policy directions while also seeking to have an overview of the main challenges facing waste management. A second source of information was garnered through the review of major Nigerian newspaper articles and editorials on waste management, flooding and environmental issues collated from 2006 to 2008¹. This provided a readily validated pool of current issues and thinking regarding the public's attitudes towards Government intervention and waste management policies on the one hand and also the Government's current position on waste management issues as well as an indication of future strategies. The combination of the reviewed policy documents and the newspaper articles helped to condense the myriad of waste management issues in Lagos into the few selected for this research.

A process flow was developed, showing the stages involved in reviewing waste management policy, based on social evidence (Figure 4.2). This was used to guide the entire study from the acquisition of baseline data to the explanation of the derived evidence and eventual policy suggestions.

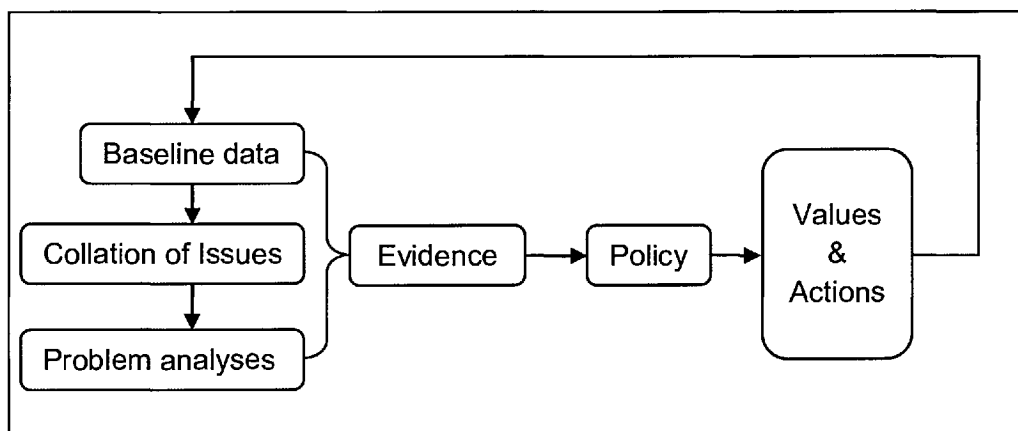


Figure 4.2 Process flow from evidence acquisition to policy formulation

¹ Online editions of: The Guardian, The Punch, Thisday, The Sun and The Vanguard newspapers.

4.5 The Quantitative Research – Questionnaires

The quantitative questionnaires were mostly administered through face-to-face interviews. The aim of the questionnaire was to establish baseline information on household attitudes and behaviour towards waste issues. The results from the questionnaire survey formed the foundation of the focus group interviews which were carried out later in the research. The topics included in the questionnaire (see Appendix B-1) were derived from a synthesis of recent studies (Davies, 1999; Cointreau et al, 2000; Fahy, 2005).

The questionnaire elicited information on

- i. Householders' evaluation and awareness of their local environment
- ii. Householders' waste disposal options and methods
- iii. Householders' attitudes and behaviour towards selected waste management issues
- iv. The limitations and motivations for improved waste management behaviour
- v. Householders' attitudes and behaviour towards selected waste management legislation

It also sought to build up statistical data for analysis and comparison with future studies as well as identifying areas for future research.

The questionnaire was designed to maximize the response rates while also minimizing bias as detailed in previous research (Neuman, 2000; De Vaus, 2002). The questionnaire consisted of a mixture of open and closed ended questions, with additional space provided at the end for any extra thoughts or comments on any previous question or on answers given, to expand on previous answers where the respondent felt further explanation was needed to qualify responses. Closed ended questions involve the respondent selecting a choice from a list of fixed answers. This form of questionnaire design enables more responses to be completed in less time and makes the coding and analysis of responses quicker than open ended questionnaires. Open ended questionnaires, however, are not as rigid in limiting the type of response the respondent chooses to give. They give more room to the respondent to answer questions in ways that

make their responses truly unique (Neuman 2000; Kitchen and Tate 2000): this is a major advantage as the true characteristics of individuals are highlighted in their varied responses. A drawback of the open ended method is that since responses will be expected to have a higher number of varied answers when compared to closed ended questions, they are harder to compile and code into statistical software for analytical purposes. Another disadvantage is that cross comparison and analysis of the results using conventional statistical software is difficult and requires a lot of time to code input the data into the software programme (Miles, 1979; Dixon-Woods et al, 2001). A balance is required in designing a system that draws out qualitative data that contextualise information without totally compromising the ability to quantify and compare results.

The initial pool of questions designed for the questionnaire were pilot tested on Nigerian postgraduate students at Imperial College, most of whom live or have lived in Lagos. This was done to improve the quality of questions and appropriateness of the format, as well as to estimate the duration for completion for each questionnaire. These questions were then pared down and further refined into the final set of 52 included in the final questionnaire which was printed out on an A3 sheet of paper and folded in half, producing a 4 paged (A4) questionnaire.

SECTION A: Background Information – The first section comprised of 12 questions and elicited information on respondents' awareness and evaluation of the severity of environmental issues in their locality. It also assessed the level of environmental concern as reported by survey respondents and served as an introduction to the rest of the survey.

SECTION B: Waste Management Practice – In the second section which comprised of 9 questions, respondents were required to provide information on their current waste disposal method. They were asked to rate their level of satisfaction with their current waste disposal service and suggest improvements they would like to see where they indicated dissatisfaction with their current service.

SECTION C: General Information – The third section comprised of 10 questions which required respondents to provide socio-economic information.

SECTION D: Waste Management Options -The fourth section was made up of 10 questions eliciting information from respondents on their choice of waste disposal service based on three hypothetical options designed specifically for this survey. The options were designed through a combination of results from the desktop surveys and initial feedback from the pilot testing phase. The section sought to identify the preferences of householders in terms of waste collection options, type of service provider, method of payment and how much they were willing to pay for the services.

SECTION E: Environmental Laws (Awareness and Acceptance) – The final section comprised of 11 questions on householders' awareness and acceptance of selected environmental laws. The laws chosen for this survey were the Environmental Sanitation laws of Lagos State and the section was designed to test the knowledge of householders' obligations as indicated within it.

4.5.1 Survey Enumerators

The survey team of enumerators for the questionnaire administration was made up of 6 people comprising the researcher, two Nigerian M.Sc postgraduate students at Imperial College and 3 volunteers recruited in Lagos.

The researcher conducted the training of all 5 other enumerators upon arrival in Lagos. The training took place within an informal setting where the goal of the research was clearly laid out to all involved. The content of the questionnaires was explained, while highlighting the usefulness of the information derived from them. Time was taken to clarify and address all questions each participant had regarding the sampling methodology, appropriateness of nominated respondents in each selected household as well as instructions not to preempt responses during the completion of questionnaires. Also, in cases where householders made requests for self completion, the enumerators were to monitor and allow the respondents to complete the questionnaire themselves. A progress meeting was held 7 days after the commencement of the questionnaire administration to compare notes on methods, challenges and solutions to issues encountered in the field and a final meeting was held at the end of the questionnaire administration phase to collate the questionnaires and obtain feedback on the entire administration exercise.

4.5.2 Survey and Sample Population

A nationwide labour strike commenced in Nigeria just as the fieldwork survey commenced. The strike lasted for the entire duration scheduled for the survey exercise and significantly limited movement during the questionnaire administration phase. Three Local government areas (LGA) had originally been selected for the questionnaire survey, Eti Osa, Oshodi – Isolo and Mushin, representing high, medium and low income areas, respectively. However, owing to the restriction of movement due to the strike mentioned earlier, Eti Osa LGA was dropped and replaced with Kosofe LGA, a medium income area. The three LGAs were selected based on where the questionnaire administrators resided with the aim of avoiding unnecessary vehicular travel during the strike and allowing each administrator to move around on foot.

A random sampling method comprising exclusively of residential areas was carried out, where each household sampled had an equal probability of being selected (Creswell, 1994). The survey involved selecting streets within the chosen LGAs randomly and then selecting residential houses on those streets randomly as there was no cohesive registry of streets in Lagos at the time the survey was conducted. The two major criteria for selecting respondents in sampled households were that the respondent was over the age of 18 and was aware of domestic decisions regarding waste disposal. It was assumed in this research that residents below 18 years may not be aware of or are not responsible for domestic decisions and were therefore deemed unsuitable for the study.

Table 4.1 Population distribution within survey locations

| Local Government Area | Population (1991) | Population (2006) | Area (Km ²) | Population / Km ² (1991) | Population / Km ² (2006) |
|-----------------------|-------------------|-------------------|-------------------------|-------------------------------------|-------------------------------------|
| Kosofe | 412,407 | 665,393 | 81.4 | 5,066 | 8,174 |
| Oshodi/ Isolo | 449,781 | 621,509 | 44.8 | 10,049 | 13,872 |
| Mushin | 539,783 | 633,009 | 17.5 | 30,880 | 36,171 |

Adapted from *Demographia.com*, 2005 and National Bureau of Statistics 2007



Figure 4.3 Map of Lagos showing questionnaire survey areas (Kosofe, Mushin and Oshodi-Isolo LGAs)

Based on guide texts (Babbie, 1990; Fowler, 1988), a sample size of 384 was calculated to be the minimum size required for a population of 15 million with 95% confidence level at a confidence interval of 5. A target of five hundred (500) households was set to be surveyed across all three LGAs. A total of 528 respondents were sampled, however only 467 questionnaires were eventually used in the study. The 61 questionnaires not used were deemed inappropriate for the study after it came to light during initial data verification that one of the volunteers who helped to administer the questionnaires had sampled secondary school students below the age of 18.

4.5.3 The Sample Distribution

Stratification is introduced in quantitative surveys so that specific characteristics are represented in the sample and the sample reflects the true characteristics of the population (Fowler, 1988). The randomly sampled survey was stratified according to income levels and these were grouped into four categories. They include; Lower class – households earning less than 2 million Naira a year, Working class – Households earning between 2 – 15 million Naira a year, Middle class – Households earning between 15 – 50 million Naira a year and Upper class – Households earning over 50 million Naira a year (see Table 4.2).

Table 4.2 Distribution of Sample Population according to Household Income

| Income Bands | Gross Annual Household Income | Assumed Distribution |
|---------------|-------------------------------|----------------------|
| Upper Class | Above 50 million Naira | 7% |
| Middle Class | (15 – 50) million Naira | 13% |
| Working Class | (2 – 15) million Naira | 25% |
| Lower Class | Below 2 million Naira | 55% |

Exchange Rate £1 = ₦ 256.13 (As of July 2007²)

4.5.4 Data collection methodology

As stated, the questionnaires were administered using face to face interview techniques. In most cases, the enumerator asked the questions as contained in the questionnaires and personally completed the questionnaire as responses were given.

Ironically, the nationwide labour strike during the 2 week of the questionnaire administration phase of the research, which had necessitated adjustments to the sampled areas, also aided response rates as many people were compelled to stay at home because of the fuel scarcity and concomitant high cost of transportation. This unique situation during the survey period allowed enumerators to be flexible with start and end times each day for calling on households. Most households called upon to participate in the survey were willing but in the few households that were not, the enumerator selected an adjacent house to the originally selected house. Each enumerator introduced themselves to the selected household, inviting them to participate in the survey and briefly explained the aim of the survey as being part of a student project on waste management policy in Lagos. Respondents were assured that all collected information was exclusively for academic purposes and allayed any suspicion that the project was in any way a source of data collection about their waste disposal habits by the Government.

² Central Bank of Nigeria: Monthly average exchange rates of the Naira, July 2007

4.5.5 Data Analysis

After the survey was completed and collated in Lagos, the researcher and the two Nigerian MSc. postgraduate students at Imperial College returned to London where the data from the 467 questionnaires were analysed using the computer software, Statistical Package for the Social Sciences (SPSS v16). The main advantage of using statistical computer software like SPSS is that it enables the user to score and analyse large sets of data quickly and accurately (Bryman and Cramer, 2001). The coding frame used for this survey (Appendix B-2) was based on respondents' own answers. Keywords derived from completed questionnaires were incorporated into the SPSS programme. An example was in questions 1 (a and b) where respondents were asked 'in your opinion, what are the two greatest environmental problems in your locality?' respondents gave varied responses from 'flooding' to 'refuse collection' and 'no drinking water'. Responses were coalesced, based on the keywords and grouped according to the themes they represented. A second group of questions, 2 (a and b) on 'the likely causes of the environmental problems mentioned in question 1' also had varied responses and these were grouped into themes based on governance, economic, technical, anti-environmental and urban planning issues.

The results and analysis from the quantitative survey are expressed in Chapter 5 and lead into the second phase of the research which was the focus group survey.

4.6 The Qualitative Research – Focus Groups

Krueger (1994) defines focus groups in terms of composition and aim as a planned discussion designed to obtain perceptions on a defined area of interest in a permissive, non-threatening environment. They typically comprise of 7 to 10 participants overseen by a moderator. While focus groups may be seen as a form of group interview, there is a marked difference between the two. Focus groups depend on participant interaction through topics introduced by the moderator to generate discussion and draw out individual insights while group interviews are basically one way question-answer sessions that involve individual participants responding to questions posed to them. Focus groups involve a higher degree of group interactivity between the time the moderator poses a question, concept or idea and when responses are given.

The focus group phase of the survey was necessary to elucidate the answers to the 'What' questions derived from the quantitative questionnaire survey. Highlighting reported behaviour, which was the aim of the quantitative survey, forms the first step in developing a behavioural baseline. The next step in building on reported behaviour is to investigate the reasons for exhibiting such behaviour, positive or otherwise, otherwise known as the 'Why' questions. The focus group survey provided a framework for asking the 'Why' questions that aided in the explanation of the contextual reasoning which motivates reported behaviour.

Various segmented groups were chosen as the subjects for the focus group sessions held in the summer of 2008 while participants in each group were randomly selected. A total of 6 focus groups, including one pilot session, were organised to produce qualitative data that are discussed in Chapter 6.

4.6.1 Focus Group Questions

A set of three themes were developed based on the issues highlighted from the quantitative study carried out in the summer of 2007, with each theme having a set of sub – questions.

- Waste disposal
- Littering
- Waste management legislation

4.6.2 Survey Team

The focus groups were conducted by a team of two, comprising the researcher and a Nigerian postgraduate M.Sc student at Imperial College. The researcher acted as the moderator during each focus group session, guiding but not setting the agenda as the aim of convening the focus group was to allow the organic development of opinions and for the moderator to be as unobtrusive as possible without allowing the discussion to stray too far from the core of the subject matter being discussed. The postgraduate student acted as the assistant moderator, recording transcripts of discussions and general observations of participants during sessions and keeping record of the duration of each session. In addition to the written transcripts, each session was also recorded electronically into an audio recording device, which was a mobile phone as it was readily available,

easy to use and encoded the audio file recorded into the Adaptive Multi-Rate format (AMR) which is compatible with most computer media players and easily played back on multiple media devices.

4.6.3 The Moderator

The Moderator of a focus group is the person directly responsible for conducting the focus group session. Gibbs (1997) notes that 'during the course of the focus group session, moderators will need to promote debate, perhaps by asking open questions. They may also need to challenge participants, especially to draw out people's differences, and tease out a diverse range of meanings on the topic under discussion'.

The moderator needs to have a firm grip on the 'handles' of the entire focus group session with the aim of, among other duties, encouraging less vocal members to participate, clarify improperly articulated statements, prevent the discourse from being side-tracked and above all, maintain participants' enthusiasm to contribute in the discussions.

While the moderator does not actively participate in the discussions, it is likely that their influence is borne on the manner and directions discussions take. For this reason, it was decided as good practice to maintain consistency in the role of moderator and assistant throughout all focus group sessions conducted. This was done to render any potential influence by the moderator uniform across all focus group session conducted.

4.6.4 Pilot Study

Before proceeding to Lagos for the focus group field work, it was deemed necessary to test the quality of the constructed focus group questions as well as to ensure that the wording was clear and the intended respondents understood the questions. This was achieved through a pilot study. The pilot study was also used to determine how long it would take to complete a full session and also to eliminate duplication of questions that generated similar responses. It also provided the researcher the opportunity to get acquainted with moderating a focus group.

Nigerian post graduate students, drawn from various faculties across the Imperial College South Kensington campus, were selected to participate in the pilot study. Six participants (who have either lived or currently live in Lagos) attended the pilot focus group session and the quality of the session proved high enough for it to be included in the final analysis discussed in later sections.

4.6.5 Focus Group Session Briefings

Before the focus group session began, a short quantitative questionnaire on some general waste management issues derived from the first quantitative survey carried out the previous year was completed by participants (lasting about 10 minutes). The results of this questionnaire were compared with the previous year's data to serve as validation for the results generated in 2007. The comparative analyses of these quantitative questionnaires are discussed in a later chapter.

General 'housekeeping' rules were established by the researcher on the expected conduct of participants during the session; participants were encouraged to voice their opinion, regardless of how trivial they may assume them to be and also not to engage in coercing other members of the session to support their ideas. It was expressed to all participants that every opinion counted and mattered and there were no right or wrong answers to any questions. Finally, permission was sought and granted to make an audio recording of the session and also to take pictures during proceedings. This record served as a backup to the transcribed data of the proceedings. Each session was moderated by the researcher. The time taken to complete the questionnaires at the start of each focus group session did not count towards the minutes logged for the session duration indicated in Table 4.3.

The above description represents the methodology adopted for all the focus group sessions.

4.6.6 Participatory Groups

A total of 6 focus group sessions were completed, including the pilot session held at Imperial College. The other 5 sessions consisted of groups from University undergraduate students, Secondary school students, University academic staff, a

sample from household residents and the final session with a group comprising market stall concessionaires.

Table 4.3 Summary of Focus Group Sessions

| FOCUS GROUP | SESSION SUBJECTS | NUMBER OF PARTICIPANTS | CHARACTERISTICS | DURATION (Mins) |
|-------------|---|------------------------|--|-----------------|
| FG01 | Imperial College London Postgraduate Students | 6 | Age range: 20 – 30 Education: Post graduate Gender: Mixed | 128 |
| FG02 | University of Lagos Undergraduate Students | 17 | Age range: 20-30 Education: Undergraduate Gender: Mixed | 96 |
| FG03 | International Secondary School Students | 8 | Age: below 20 Education: Secondary school Gender: Mixed | 35 |
| FG04 | University of Lagos Lecturers | 11 | Age: 25 - 60 Education: Post graduate Gender: Mixed | 53 |
| FG05 | Household Residents Egbeda, Lagos | 11 | Age range: 25 - 60 Education: Graduate and post graduate degrees Gender: Mixed | 73 |
| FG06 | Bariga Market Stall Concessionaires | 11 | Age range: 30 and older Education: Informal, post primary, secondary Gender: Mixed | 35 |

Imperial Post Graduates – The Pilot Study

The Imperial College focus group served as the pilot study for testing the focus group questions and also as a general test running of moderation and recording techniques that would be deployed in later sessions. Invitations were made to various Nigerian postgraduate students at the South Kensington campus through word of mouth and 6 participants indicated their willingness to participate. A private study room on the Imperial College South Kensington campus was booked and used as the venue for the session.

The pilot session spanned over two hours. A major reason for this was that this was the first focus group session the researcher had ever convened and so it took some time to adjust into the role of the moderator, tasked with 'steering' the discussion along the right path. Participants were then given a broad introduction about the aim of the research study and also the use of this particular session as a pilot study for the fieldwork that was scheduled to commence a few weeks after. The researcher had no prior training in organising or moderating focus groups. The basic skills and knowledge utilised during the focus group sessions were acquired through numerous literature reviews of what constituted 'best practice' in organising focus groups (Krueger, 1994 and Gibbs, 1997). The pilot study provided the opportunity to hone the skills required for the subsequent sessions. There was a marked improvement in the organisation and moderation of the focus groups as the number of sessions progressed – the reduction in session duration confirms this.

At the end of the session, participants were thanked for their participation.

University of Lagos Undergraduate Students

A lecturer at the University of Lagos had been contacted for assistance in recruiting undergraduate students and lecturers as participants for focus group sessions before the survey team arrived in Nigeria. Announcements were made by the lecturer during classes to students of the Civil Engineering Department and interested students indicated their willingness to participate. A total of 17 undergraduate students participated in the session in what was the first focus group session held after the pilot study. This was the largest session, in terms of participants, conducted during the study and there were challenges in moderation, especially during some periods in the discussion when some participants, obviously highly opinionated, were keen on 'hugging the mike' and not allowing others to express their opinions. The moderator improvised during this session by introducing mini breaks at the end of each question to summarise participants' expressed opinions. The breaks also proved useful in situations where participants veered into expressing their opinions in monologues.

International Secondary School Lagos Students

The principal of the International Secondary School Lagos, based within the University of Lagos campus was approached by the research team upon arrival in Lagos and during the meeting with him, the researchers explained the aim of the fieldwork and requested permission to hold a focus group session with students at his school. The principal obtained permission from the parents of the students and personally nominated 8 participants for the focus group session which was held within the school's premises during lunch break. The session lasted the entire duration of the lunch break (about 30 minutes) and refreshments were provided for the students during the session. The age group that made up this focus group session (below 18 years of age) was excluded from the questionnaire survey in Chapter 5 because it was felt they may not be aware of the domestic decisions taken within their homes. However, the qualitative phase of the research in Chapter 6 included a session with secondary school students with the primary aim of investigating if there were any significant differences between their responses to the quantitative questionnaire administered as part of the focus group session and the collated results of the quantitative questionnaires from Chapter 5. The qualitative data provided by this group also served to highlight any divergent opinion between age groups on the 'Why' questions.

University of Lagos Lecturers

The lecturer previously approached for the undergraduate focus group session took the survey team around various departments across the University campus where he introduced the project and allowed the researchers to speak directly to each lecturer. Eight lecturers indicated their willingness to participate and a suitable date was fixed and a venue was generously donated by the Department of Civil Engineering. On the day of the session, all 8 lecturers attended and 3 more joined in, bringing the total to 11 participants for this particular session. The session lasted just under an hour.

Unity Housing Estate Egbeda Residents

The penultimate focus group session organised was constituted with the primary purpose of discussing waste management from the perspective of regular

householders. Residents within the estate, a middle income development, were all invited to participate and 15 people indicated willingness to participate while 11 turned up for the session which was held at the residence of one of the participants. An extra theme, willingness to pay for waste services, was included in this session as the researcher felt the home setting for the focus group provided the ideal platform to discuss issues of domestic waste disposal.

Bariga Market Concessionaires

The final focus group session was held with market stall concessionaires in Bariga Market, one of the largest open markets in Lagos. The researchers approached the elected leader of the concessionaires known as the *Iyaloja*, literally meaning 'mother of the market', and sought permission from her to conduct the session. The *Iyaloja* then randomly nominated stall concessionaires to participate in the session with us. The *Iyaloja* along with her key officers also participated in the focus group. A total of 11 people participated in this session which was the only one conducted entirely in Yoruba, the major language spoken in the south west of Nigeria.

4.6.7 Data Analysis

Following the conclusion of all the sessions, the completed quantitative questionnaires as well as the transcribed observations were collated with the audio recording of each session. Codes were assigned to each group and numbers were assigned to individual participants in each group. For example, the session with unity estate residents was assigned a numerical code of FG05, where 'FG' stands for focus group and '05' stands for the number sequence assigned to that session. Furthermore, each individual participant was assigned a number code between 01 and X, where X was the total number of participants. As an example, FG0510 would be the code representing the 10th participant in the 5th focus group session.

The results of the focus group sessions are detailed in Chapter 6; in that chapter, the quotes taken from the focus groups are indented and written in quotations preceded by the unique coding system that identifies the individual and focus group session where the comment was made. The quotes were taken directly from the audio transcripts of the recorded sessions, (verified by the written

transcripts) and as a result, some of them contain the use of jargon or colloquial language. All unclear words contained in the focus group transcripts and used within the body of the thesis have been edited by the researcher to clarify words or statements used in the focus group and appear in square brackets within the respondents' quotations. During the discussion of the survey results from Chapters 5 onwards, the words "Residents", "Respondents" "Participants" and "Householders" are used interchangeably and all refer to the surveyed population during the two surveys except where expressly stated.

4.7 Survey Methodological Issues

Waste management policy in Lagos is constantly evolving. Since the commencement of this research (May, 2006), various new policies (which include the expanded PSP collection system as well as the introduction of the posters indicating collection days) have been introduced by the Government and these may have influenced household behaviour towards various waste management issues, positively or otherwise. The difference in timings between the desktop study (2006 – 2009), questionnaire fieldwork (summer 2007), focus group fieldwork (summer 2008) and data analysis (2007 – 2009) should be taken into account when comparing the results of this research with the present time. The data included in this research, as with all attitude and behaviour based works reflect a timestamp of prevailing conditions when this research was carried out.

The sections below refer to some methodological issues that were specific to each of the quantitative and qualitative fieldwork surveys.

4.7.1 Quantitative Survey

During the administration of the questionnaires, there were a few constraints that influenced the choice of study areas as well as number of questionnaires completed during the fieldwork survey. The nationwide labour strike, as mentioned previously, restricted movement of the survey team and also necessitated the altering of the LGAs that were sampled, however, this should not be seen to have devalued the quality of the data gathered since the dropping of Eti Osa LGA for Kosofe did not significantly alter the income stratification used for the survey, also the presence of most householders at home during the survey exercise increased the number of participants surveyed during the

exercise. The second issue was the length of the questionnaire. At four pages long, it was a bit of a challenge administering as many questionnaires as needed during the timeframe of the fieldwork. Each questionnaire typically took between 45 minutes to an hour to complete and sometimes longer in cases where a translation into a local language, Yoruba or Pidgin English was necessary.

In hindsight, there were a few questions that the researcher felt could have been followed up with subsequent questions to clarify stated opinions from respondents. These issues were not picked up during the pilot testing phase of the questionnaire survey but it is necessary to state them as a guide for future surveys.

Section A: Question A9 which asked 'Are you willing to separate your waste before collection?' may have been followed up with questions on why they answered yes or no and also possibly state what incentives they might need to be willing to do so.

Section C: The income range³ in question C6 was amended from ₦ (<1million, 1-25 million and >25 million) to ₦ (<2million, 2-15 million, 15-50million and >50million) just before the commencement of the survey but after the printing of the questionnaires and so the old range exists on the questionnaire in Appendix B-1, however the newer range was used during the survey. The range was amended after feedback from the pilot study determined that the initial range was too wide and would affect the stratification of the sample population. Unfortunately, the changes were not conveyed to the printer before the questionnaires were printed and so the older ranges are contained in the Appendix. A further addition to this range in hindsight may have been the spreading of the groups into 5 categories, perhaps looking more like ₦ (<1, 1-4, 4-10, 10-20 and >20 million). This may have potentially generated a different hue to the stratified samples used in this survey as it was found that very few households earned a combined income of >50 million and so could easily have been grouped with those earning more than 20 million.

Section D: The range of payments for the various waste collection options in questions D2b, D3b and D4b were slightly off target. The ranges adopted for the

³ exchange rate of £1 to ₦231.94 as at July 2008

questionnaire were guesstimates and turned out to be slightly more expensive (₦500 per household) than the waste collection charges that were just being introduced by the Lagos State Waste Management Authority (LAWMA) in the month the survey was conducted.

4.7.2 Qualitative Survey

Studies have shown that people's behaviour tends to be affected when they become aware that they are being observed. This phenomenon called the 'Hawthorne effect' is well documented in social and management research (Wickström and Bendix, 2000). It is difficult to ascertain the extent to which responses from participants were made for the benefit of the moderator and perhaps did not reflect their true opinion about issues discussed. To limit the impact of the Hawthorne effect, participants were briefed at the start of each focus group session about their role in the research and encouraged to express their opinions without prejudice as explained earlier on in the Focus Group Session Briefings section. The near uniformity in responses across all focus groups when similar questions or issues were tabled before them leads the researcher to conclude that the Hawthorne effect was not significant in this study.

4.8 Integrating Evidence into Policy

Based on the theoretical model developed by Kollmuss and Agyeman (2002), the acquired baseline of the barriers to pro-environmental behaviour, covered during the focus group sessions, were highlighted under internal and external factors.

Selected waste management policies in Lagos – the Environmental Sanitation Programme (ESP) and the Private Sector Participation programme (PSP) were then used as exemplars to test the efficacy of the waste management policies, using the social evidence acquired. This was achieved by examining the intended objectives of each policy against the views of householders regarding their participation and support of the policies.

Finally, a waste and resources framework (Figure 4.2) was designed to model potential impacts of current policies on the management of solid waste and resources in Lagos, particularly in regards to the extraction of reusable and recyclable materials from the system before final disposal. The model highlights the primary routes for household waste flows and the principal stakeholders

involved in the collection, extraction of resources and disposal of wastes from households. It categorises resource extraction routes into 3 levels based on a hierarchy of quality. Level 1 comprise of clean, unmixed materials, level 2 comprise of materials sorted from general household wastes, temporary dumps and from streets, while level 3 comprise of materials scavenged from permanent dumps.

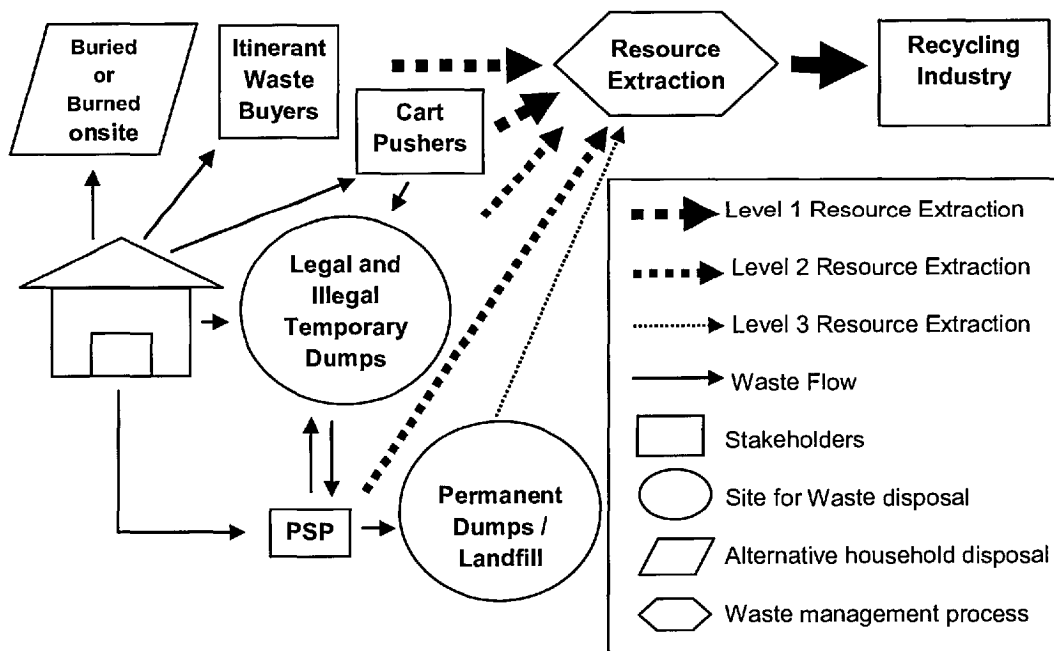


Figure 4.4 Waste and resource flow framework

4.9 Summary of Research Methodology

The methods selected and deployed in achieving the stated aims and objectives of this research have been detailed in this chapter. Using a combination of quantitative and qualitative investigative statistical techniques, the research was able to explore householder attitudes to waste management issues in Lagos. The data generated quantitative baseline information on householders' attitudes about their environment and environmental behaviour as well as qualitative information on why certain opinions, beliefs and behaviours were expressed. The next chapters detail the analysis of both the quantitative and qualitative surveys and conclude with a summary of the current and future policy implications on waste management in Lagos based on the results derived from the analysis.

CHAPTER 5. GENERAL ATTITUDES TO WASTE MANAGEMENT

5.1 Introduction

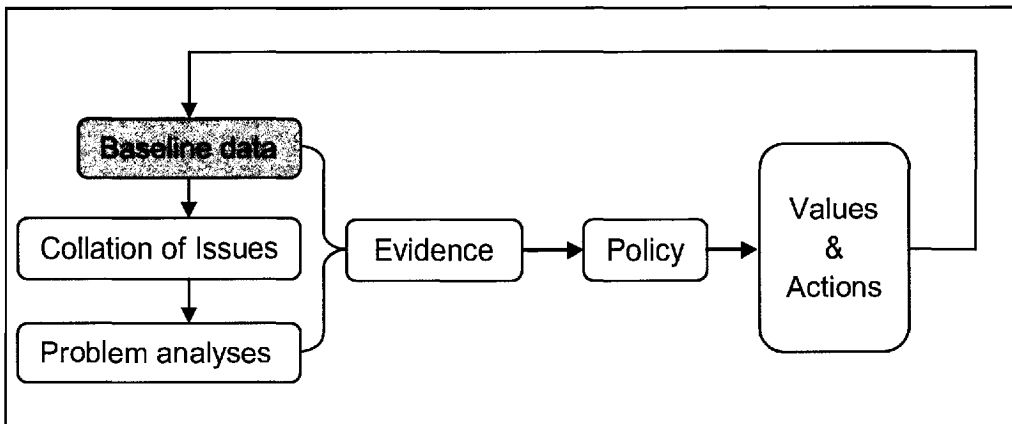


Figure 5.4.1 Flow chart showing the acquisition of quantitative baseline evidence

This Chapter describes the process through which a baseline on household attitudes to waste management issues in Lagos was derived. The fieldwork took place in June and July 2007 and focused mainly on gathering quantitative data through the questionnaire survey described in chapter 4. The sections below highlight the reported views of respondents towards their environment, their preferred waste disposal methods, willingness to pay for waste disposal services as well as their knowledge and awareness of key waste legislation in Lagos. Emerging themes from the data analysis provide foundational knowledge about baseline information on respondents' attitudes to waste management issues in Lagos. The questionnaire used for this survey was comprehensive and encompassed a wide variety of issues. However, it cannot be assumed to have covered all waste management issues in Lagos and it represents a snapshot in time. Therefore the results should not be viewed as the definitive compendium of household attitudes in Lagos, rather, they should be viewed as a baseline of attitudes towards key waste management issues at the time the survey was conducted (June – July 2007).

The questionnaire elicited` information on:

- General awareness of environmental issues

- Current waste management (disposal) practices
- Willingness to Pay for waste collection services
- Knowledge and awareness of waste management campaigns and;
- Compliance with waste legislation

A summary of relevant findings are presented in the sections below, while the original survey questionnaire is presented in Appendix B-1 of this thesis.

5.2 Profile of Respondents

A total of 467 questionnaires, from respondents living in households in Mushin, Kosofe and Oshodi–Isolo Local Government Areas (LGAs) were administered during the fieldwork exercise. Of these, 423 were administered by the survey team in the respondents' homes during the period of study using methodologies described in Chapter 4 while 44 questionnaires were left with the respondents for self completion and were collected on later dates. Not all questions were completed by respondents, particularly the gender section from the self completed questionnaires. All results discussed below exclude all 'null' responses to questions and so the total number of responses from each question varies.

5.2.1 Gender

The sampled population comprised almost two thirds male respondents (62.2%) (Table 5.1). There were no fixed criteria as to who should respond to the questionnaire in each household as long as the respondent was older than 18 years and was responsible for domestic (waste disposal) decisions on behalf of the household. The prerogative of selecting each household survey respondent was left with the members of the household. This was done with the intention of allowing the most appropriate member of each household to be selected to respond to the questionnaires. There was an expectation of a higher proportion of female respondents, primarily because of the main domestic roles women play in households in Nigeria. The higher proportion of male respondents may be explained by their presence at home during the national labour strike discussed in Chapter 4. In some cases, while some men acknowledged that they did not personally oversee the day-to-day domestic activities in their homes, they were nevertheless fully aware of all decisions taken and so felt capable of answering the questions posed to them by the administrator of the questionnaire.

Table 5.1 Respondents' Gender

| | Frequency | Percent |
|--------------|------------|------------|
| Male | 263 | 62.2 |
| Female | 160 | 37.8 |
| Total | 423 | 100 |

Table 5.2 Respondents' Age

| | Frequency | Percent |
|--------------|------------|------------|
| 24 and below | 78 | 17.1 |
| 25 - 34 | 175 | 38.5 |
| 35 - 44 | 132 | 29 |
| 45 - 54 | 50 | 11 |
| 55 - 64 | 16 | 3.5 |
| 65 and above | 4 | 0.9 |
| Total | 455 | 100 |

5.2.2 Age

Table 5.2 shows the distribution of respondents according to age. More than 99% of the respondents were of working age (18 – 64 years). This was expected, as in most households, adults were responsible for domestic responsibilities, either directly or in a supervisory role. The high proportion (62.3%, 255) of respondents of working age (18 – 64 years) male respondents at home at the time of the questionnaire administration (Table 5.3) again may be explained by the national labour strike mentioned earlier (See Chapter 4). There were a few retirees (65 and above) among the respondents sampled. In most cases, older respondents nominated younger members of their household to participate in the questionnaire interviews and this can be observed where the distribution of respondents' ages decreases significantly as age increases. The average age of respondents was about 35 years.

Table 5.3 Respondents of working age

| Age | Gender | | |
|--------------|------------|------------|------------|
| | Male | Female | |
| 24 and below | 41 | 26 | |
| 25 - 34 | 97 | 63 | |
| 35 - 44 | 75 | 46 | |
| 45 - 54 | 31 | 15 | |
| 55 - 64 | 11 | 4 | |
| Total | 255 | 154 | 409 |

5.2.3 Type of accommodation

Figure 5.2 shows the distribution of respondents according to type of accommodation (housing tenure). More than half (60.1%) of respondents surveyed were living in rented accommodation, 22% owned their place of residence, 4% lived in residences owned by their employers, while of the remainder 12% were living in residences owned by their relatives. A few respondents (about 2%) mentioned that their living arrangements could not be classified under the previous groups, some of the respondents under this group mentioned that they were living with friends. This group of respondents was classified under 'other' during the coding of questionnaire results.

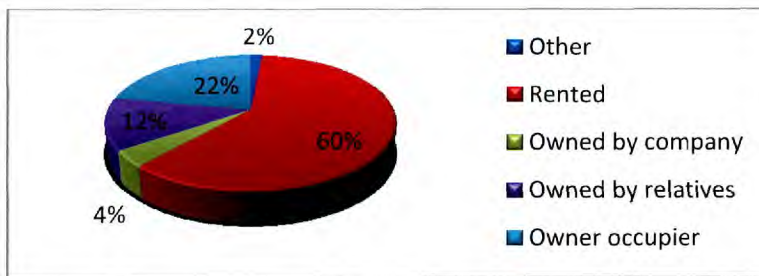


Figure 5.2 Respondents' Type of Accommodation

5.2.4 Level of education

Figure 5.3 shows the distribution of respondents according to the highest attained levels of education. The result shows that more than half of respondents (71.6%) had at least tertiary level education (Post Secondary School qualifications – University, Polytechnic, etc). This figure, while not discounting the possibility of exaggeration by respondents, may be explained by the nomination of the most educated / literate occupant in most households for the questionnaire administration. Respondents who had not attended any formal education (had not gone to school), but had received vocational (for example, through

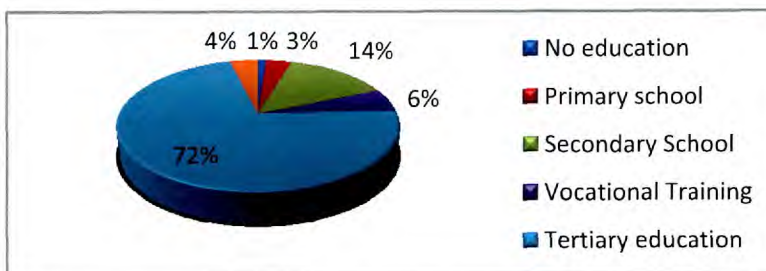


Figure 5.3 Respondents' Highest Level of Education

apprenticeships) or religious based (through Islamic Koranic 'schools') education were classed as having received informal education.

5.2.5 Household income

| Income | Frequency | Percent |
|------------------------|-----------|---------|
| Below 2 million naira | 256 | 58.2 |
| 2 - 15 million naira | 160 | 36.4 |
| 15 - 50 million naira | 21 | 4.8 |
| Above 50 million naira | 3 | 0.7 |
| Total | 440 | 100 |

Table 5.4 Respondents' Annual Household Income

Almost 60% of households (Table 5.4) earn less than 2m Naira (£8,000) per annum. The ranges used in the questionnaire (below 2m, 2-15m, 15-50m and above 50m) proved, in hindsight, to be too wide to get a clearer picture of this variable (See Chapter 4). This was due to the lack of official data on household income to draw inference from and so a guesstimate of figures and ranges was made by the researcher.

5.2.6 Number of people in residence

On average, about 6 people live in each household (see Figure 5.4) and lower income households tended to have larger family sizes.

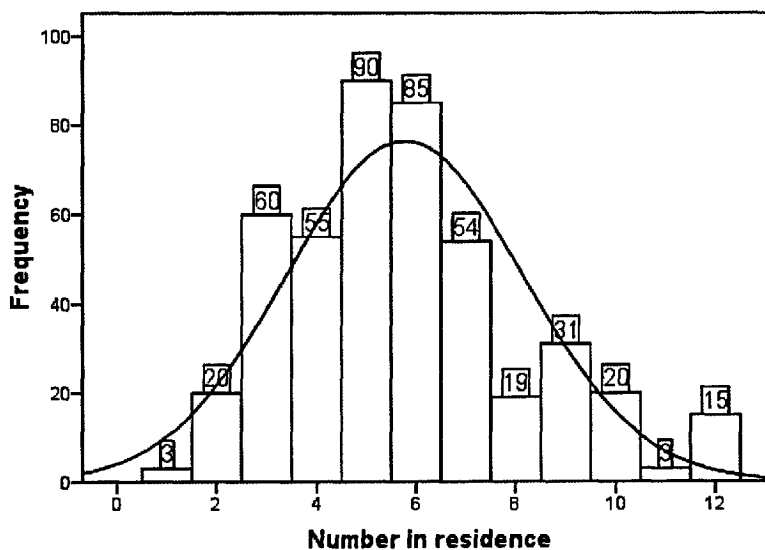


Figure 5.4 Number of People Living in Respondents' Residence

5.2.7 Occupation

Figure 5.5 shows the distribution of respondents according to their types of occupation. Just over 36% of respondents were engaged in full time employment, while another 22% classified themselves as self employed. About 66% of respondents were in some form of employment, either part time or full time, 19.7% of respondents were students, 7% were unemployed while 7% of respondents were retired.

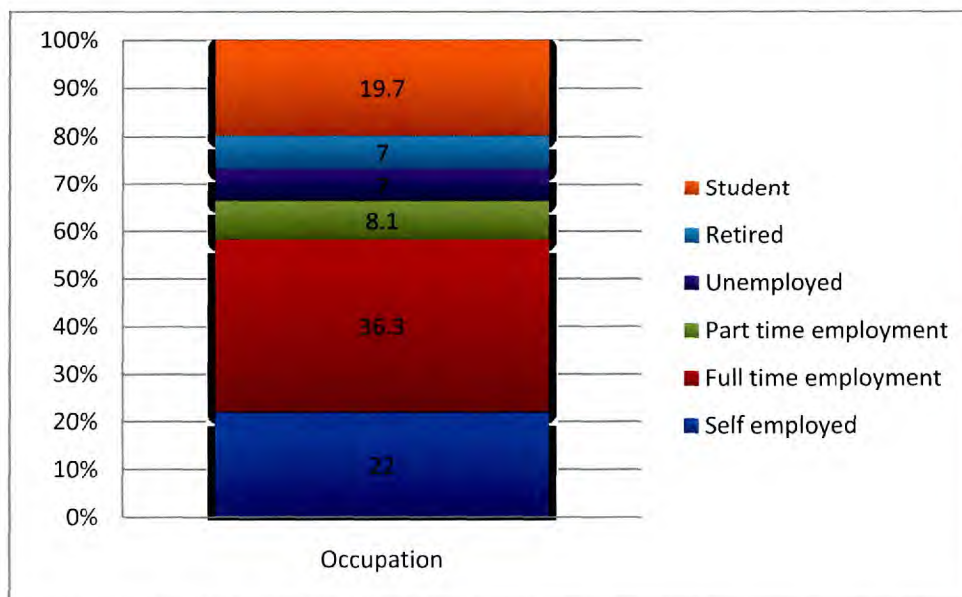


Figure 5.5 Respondents' Occupation

5.2.8 Number of income earners

Figure 5.6 shows the distribution of income earners in each respondent's household. There was an average of just about three income earners per household. Lower income households had more occupants as income earners than higher income households. Lower income households had larger numbers of people living within the residence compared with higher income households, hence there is a higher probability of having more income earners. It may be inferred that the higher the income of a single family member is, the less the need for more members to work.

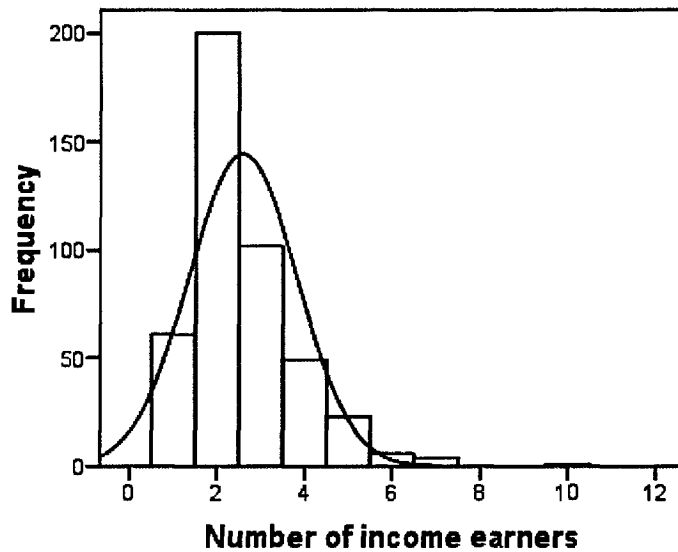


Figure 5.6 Number of Income Earners in Respondent's Household

5.3 Environmental Awareness

Two sections of the questionnaire were developed to Questions A (1, 2, 3, 4, 5, 6, 7, 8, 9, 11 and 12) as well as E (1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11) (see Appendix B-1) were developed to highlight respondents' concern and awareness of prevailing environmental issues. The sections below contain the discussion on some of the results from the questionnaire survey. The aim of this discussion is to highlight baseline information as well as provide evidence to test the hypothesis stated in Chapter 1 on whether the neglect of household attitudes in the formulation of waste management policy had contributed to the failure of waste management systems.

5.3.1 Sources of environmental problems

The first question required respondents to state and rank the two greatest environmental problems they face in their locality. Two boxes were provided in the questionnaire to be filled for each problem. Waste issues (which were a collation of refuse collection issues), as well as drainage and flooding were the first and second reported problems listed by respondents with the highest ranked scores (Table 5.5).

Table 5.5 Personal views of householders on the greatest environmental problems in Lagos

| Problem Sources | Rank (%) | | Combined |
|-----------------------|----------|--------|----------|
| | First | Second | |
| Waste issues | 23.9 | 31.7 | 27.8 |
| Drainage and flooding | 22.2 | 18.3 | 20.3 |
| Sewage and wastewater | 17 | 13 | 15 |
| Electricity | 14.8 | 14.3 | 14.6 |
| Bad roads | 13.3 | 11.9 | 12.6 |
| Drinking water | 7.6 | 9 | 8.3 |
| Air pollution | 1.1 | 1.5 | 1.3 |
| Noise pollution | 0.2 | 0.2 | 0.2 |
| Total | 100 | 100 | 100 |

It should be noted that while it may be clear to an academic observer that *Electricity* is not an environmental 'problem' in the conventional sense, householders expressed their opinion about it through the responses they gave during the administration of the questionnaire and as it emerged as a recurring theme throughout the entire questionnaire administration, the researcher decided to include the issue in the final coding of results as it mirrored the true sentiments of respondents.

For clarity, Table 5.5 represents percentage responses for the first and second greatest environmental problems, while the '*Combined*' column represents the percentage average for the ranked responses.

5.3.2 Likely causes of the perceived problems

Responses regarding what the respondents felt were the two likely cause(s) of each of the two greatest environmental problems ranked above were coded along recurring themes. The main themes derived from the questionnaire varied from governance (which was designated as issues regarding the management of the environment by the Local or State Government), economic (which was designated as issues regarding the financing of the waste management sector as well as respondents' ability to pay for waste management services) and anti-environmental issues (broadly based on the perception of anti-environmental

human behaviour). Technical issues were based on responses that indicated use of functionally inappropriate technologies for delivering waste services (for example, the use of converted, hollowed out buses) or issues regarding the use of equipment that was inefficient (for example, the use of very old trucks that broke down frequently) and also urban planning issues that referred to responses like 'no drainage system', 'no public waste bin' and 'inability of government to cover open drains'. These themes sometimes were referred to by respondents as 'stand alone' answers, but in most cases, they were a combination of two issues, making a minimum of two possible causes and a maximum of four.

The robustness of the coding frame was designed to accommodate the varied responses from respondents into grouped themes to ease the flexibility of coding responses for statistical inference. The majority of respondents referred to problems relating to governance and anti-environmental issues most frequently. 14.8% of respondents mentioned issues relating to governance and economic issues as the likely cause of the first greatest environmental problem in their municipalities, closely followed by governance and anti-environmental issues. 9.6% of respondents regarded governance and economic issues as the cause of the second environmental problem as well, followed closely by anti-environmental issues and urban planning. Respondents mentioned issues like 'Government being ignorant of waste management problems' and 'Government not providing waste bins for the community...', 'people's *bad* environmental behaviour' and 'housing congestion'. In order to qualify these largely qualitative responses, comments by respondents were recorded and used to structure the qualitative survey discussed in the next chapter.

5.3.3 Responsibility for addressing environmental problems

After the information on the causes of the environmental problems had been recorded, respondents were then asked to identify who they felt should be responsible for addressing each of the problems mentioned in the first question. Table 5.6 represents the ranked responses of respondents' views on who they felt should be responsible for addressing their two top ranked environmental problems.

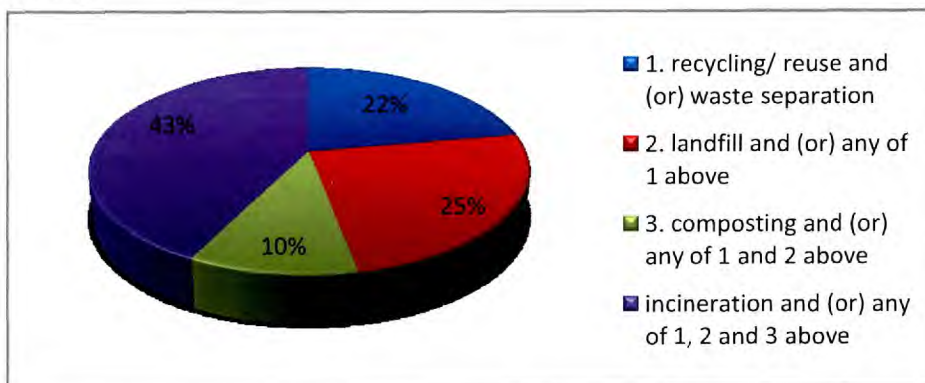
Table 5.6 Responsibility for addressing environmental problem

| Variable | First Group | Second Group | Combined |
|----------------------------|-------------|--------------|----------|
| Don't know | 0.9 | 3.1 | 2 |
| Nobody | 3.4 | 4.7 | 4.1 |
| Individuals | 24.1 | 21.9 | 23 |
| Local community | 14.7 | 20.8 | 17.8 |
| Local and state government | 52.9 | 39.6 | 46.3 |
| Private sector | 3.9 | 9.9 | 6.9 |
| Total | 100 | 100 | 100 |

The results show that respondents, in both cases, felt the responsibility for addressing the environmental problems lay with the local and state government, individuals and the local community, in that order.

5.4 Waste management

Respondents were asked to identify the waste management concepts that they were familiar with out of waste separation, reuse, recycling, composting, incineration (which in this context referred to the open burning of waste) and landfill.

**Figure 5.7 Respondents' familiarity with selected waste management methods**

Less than 10% of respondents claimed not to be familiar with any of the waste management methods explained to them. Incineration [open burning] was chosen as the most familiar method of waste disposal. This was expected as it is perceived as a cheap, cost effective waste disposal method by households in Lagos, particularly households in the lower income groups. Respondents were then asked if they were interested in how their waste was disposed. 79% of

respondents replied that they were interested, while about 19% replied that they were not.

5.4.1 Waste collection

Over 50% of respondents felt refuse [waste] collection was a very serious problem in their area. A further 27.7% felt it was at least a serious problem while 7.3% said refuse collection was not a problem in their area.

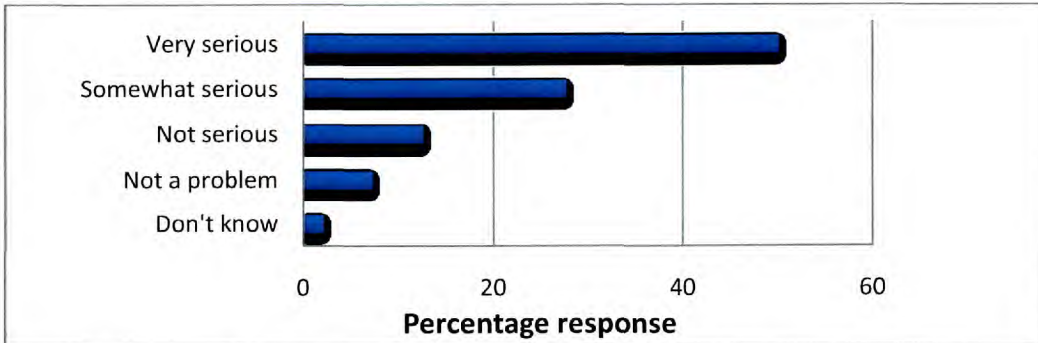


Figure 5.8 How serious is the refuse collection problem in your area?

Respondents were asked how serious the issue of street littering and illegal dumping of refuse was in their area. Over 60% said it was a very serious problem, while less than 5% said it was not a problem.

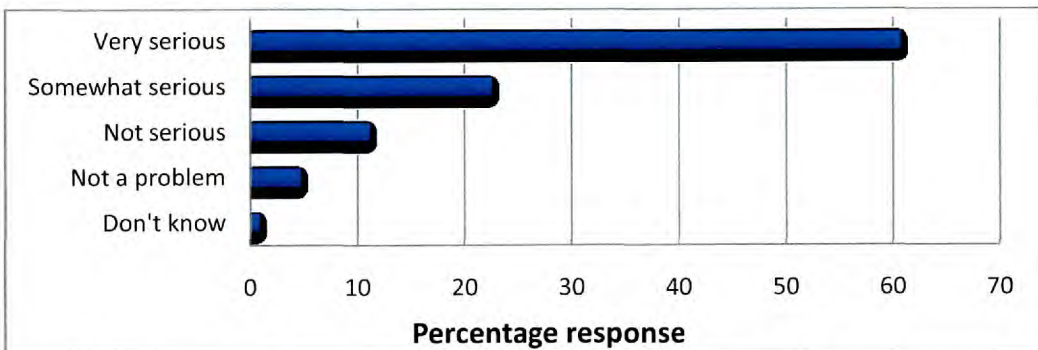


Figure 5.9 Seriousness of street littering and illegal dumping of refuse in neighbourhoods

The overall trend shows that most householders consider both issues of refuse collection as well as street littering and illegal dumping of waste to be very serious problems in their areas, irrespective of location and household income level.

5.4.2 Waste management strategies

This section represents the data derived from a series of questions (see Appendix B-1) put to respondents which were intended to give insight into the domestic decisions that influence their waste management strategies (Questions A9, B1, B2, B3, B4, B5, B6, B7, B8, B9 and all questions in section D).

The general opinion of respondents when asked if they were willing to separate their household waste before collection was evenly balanced. About half of the respondents said that they would be willing.

Respondents were then asked what method they used most frequently for the disposal of their waste. Respondents were given the option to choose more than one waste disposal method as multiple responses were already anticipated and integrated into the questionnaire.

More than half of respondents (53.7%) said they used collection services from cart pushers only. About a quarter of respondents (23.6%) used collection services from private sector waste collectors (PSP) only and the rest were a mix of the cart pushers, the PSPs and other methods which varied from open burning or burying in the ground to dumping in storm drains and canals (Table 5.7). Respondents in PSP serviced areas mentioned the irregularity of waste collection by PSP operators as one of the main reasons why they use 'other' methods for their waste disposal.

Table 5.7 Household waste disposal method

| Method | Frequency | Percent |
|---|-----------|---------|
| Other methods | 33 | 7.1 |
| Collection Service by Cart Pushers only | 248 | 53.7 |
| Collection Service by PSP operators only | 109 | 23.6 |
| Collection Services by Cart pusher and PSP operators only | 14 | 3 |
| Cart pusher and other methods | 35 | 7.6 |
| PSP operators and other methods | 1 | 0.2 |
| Cart pushers, PSP operators and other methods | 22 | 4.8 |
| Total | 462 | 100 |

Question B3 required respondents to rate the waste disposal (household collection services) service they were currently receiving. From the responses, it was clear that there were a few households who used multiple waste disposal (collection) methods and again, the most frequent reason given by householders for this was the irregularities in service provision, either by the PSP – in PSP service areas – or cart pushers. Overall, slightly over 20% of respondents that used cart pushers said they were very satisfied with the service they were receiving, while a further 36.2% said they were satisfied and another 30.8% said the service they receive was 'okay' (Table 5.8). About 48% of PSP service users rated their service as at least satisfactory, while a further 20.7% said the service they received was 'moderate' (okay) (Table 5.9).

Table 5.8 Rating of Cart Pusher service

| | Frequency | Percent |
|-------------------|-----------|---------|
| Very Satisfactory | 68 | 21.4 |
| Satisfactory | 115 | 36.2 |
| Okay | 98 | 30.8 |
| Poor | 16 | 5 |
| Very Poor | 21 | 6.6 |
| Total | 318 | 100 |

Table 5.9 Rating of PSP service

| | Frequency | Percent |
|-------------------|-----------|---------|
| Very Satisfactory | 32 | 17 |
| Satisfactory | 58 | 30.9 |
| Okay | 39 | 20.7 |
| Poor | 31 | 16.5 |
| Very Poor | 28 | 14.9 |
| Total | 188 | 100 |

The majority of respondents (47.2%) mentioned that they would like a regular and frequent waste collection service when they were asked what improvements they wished to see in their current waste collection service, regardless of the service provider. A further 16.6% of respondents mentioned that they would like the government to provide a subsidy on waste collection services, while 6.6% of respondents said no further improvements were needed.

Table 5.10 Willingness to pay for an improved waste collection service

| | Frequency | Percent |
|-------|-----------|---------|
| No | 135 | 29.7 |
| Yes | 319 | 70.3 |
| Total | 454 | 100 |

Table 5.11 Willingness to pay for an improved waste collection service (regular collection respondents)

| | Frequency | Percent |
|-------|-----------|---------|
| No | 31 | 18.2 |
| Yes | 139 | 81.8 |
| Total | 170 | 100 |

Over 70% of respondents said that they were willing to pay more money for an improved waste collection service when the question was put to them (see Table 5.10). This figure increased to over 81% when the list of respondents was narrowed to include only those who had earlier mentioned that they would like a regular and frequent collection of waste from their premises (Table 5.11). Analysis of responses to this question shows a general upward trend in respondents' willingness to pay more money for an improved waste collection service with increasing household income. The exception to this trend was found in the results from the highest income group (over 50 million naira per annum) where householders said they were not willing to pay more money for an improved service. This may be viewed in context, as these high income households already have private arrangements for their waste collection. Even before the commencement of the PSP programme, private waste operators had been providing waste collection services to high income neighbourhoods because they could afford to pay fees that would sustain a waste collection business. Reluctance to pay more for an improved service may have implied that they were happy with the level of service they received and did not see the advantage of paying more.

5.4.3 Willingness and affordability to pay

Most respondents (70.3%) said they would be willing to pay more than they currently were for an improved waste collection service, however, it turned out, upon further questioning about this that some householders were not paying for PSP services, even in areas where they received regular collection services.

Question D1 required respondents to choose from one of three hypothetical waste management options presented to them. The options varied in cost, complexity of the system and convenience of use.

Option 1 (the cheapest) was conceptualised as a basic collection system that would involve respondents disposing their wastes in a centrally located communal bin for secondary collection. This option would require active household involvement in transporting the waste from their homes to the communal bins located within a short walking distance from their homes and the surrounding areas around the bin would be kept clean by a service attendant. A secondary collection service would then collect the waste from the bins periodically and transport it to the landfill. The services of the attendant and the secondary collection would attract a fee which would be equally borne by all residents in the neighbourhood. This option was conceptualised with the intention of maximising household waste collection from households, particularly in high density areas where poor roads have hampered current door to door waste collection services by the PSP operators. It was also intended to reduce the time it took for waste vehicles to make return trips to the landfill disposal and back.

The second option was similar to option 1 in that it still involved the transport of waste from households to a centrally located bin for secondary collection by a service provider. The addition to this option was that instead of the respondents personally transporting the wastes to the communal bin, a primary service would be offered to collect the wastes from households by the private sector, being either informal sector cart pushers or small scale formal sector service providers. The inclusion of this primary collection service would be at a cost to each household on top of the shared cost of the larger secondary collection service. This was conceptualised to accommodate the already strong informal sector waste service operations that currently exist in Lagos, with the intention of testing how much of respondent waste disposal decisions were influenced by convenience as against cost of service.

The third option proposed to respondents, which was presented as the most expensive, involved a conventional door to door household waste collection service by a PSP operator. There would be no intermediate collection involved in this service and each household would be obliged to purchase a bin from the service provider which would be placed in front of their residence and emptied on specified dates weekly.

There was no clearly defined pattern from the general responses to the option chosen by the respondents. However, there were significant variations along

gender and household income groups. Most women (37.3%) showed a preference for the highest, most expensive option, while the reverse was the case for male respondents, with over 40% of male respondents opting for the cheapest option (see Appendix B-3). There was a clear trend of households' preference for option 3 with increasing income (Appendix B-4).

43.2% of the total respondents mentioned that they were not willing to pay for any of the services presented to them, while 15.4% said they would prefer to manage the waste themselves. Interestingly, the group of respondents who mentioned that they would like to manage the waste themselves are comprised mostly of households that currently use cart pusher services (67.2%) (see Appendix B-5).

5.5 Knowledge of environmental legislation

The last section of the questionnaire required respondents to answer questions highlighting their knowledge of the Environmental Sanitation Programme (ESP).

Almost all respondents mentioned that they were aware of the ESP in Lagos State when the question was put to them. Out of this group, over 66% mentioned that they had heard about it through Radio and Television sources, while another 15% mentioned that they had heard about the ESP through word of mouth, while 12% had heard about it from school. Most respondents who said that they had heard about ESP from school were aged 44 and below, this may be explained by the fact that this group of respondents would have been in the formal education system at the time the ESP was launched in the mid 1980s.

Next, respondents were asked two questions (E5 and E6) to highlight how much detail they knew about the content and obligations within the ESP. Question E5 required respondents to identify the correct times the monthly exercise was held, while E6 required respondents to mention which areas of their surroundings they were legally responsible for cleaning during the exercise.

Most respondents (97.8%) were correct with the times the exercise took place, but out of these, the majority (77.8%) failed to identify the areas they were legally responsible for cleaning during the exercise. The number of respondents who were able to give the correct answer in both cases was 82, representing about 18.3% of 448 respondents who answered these two questions. The number of

correct responses to all questions was further reduced when respondents were asked “At what time should your refuse bin be placed outside your premises?” and “refuse should be packed in which material?”

Overall, 29 respondents, representing 6.2% of the total number of respondents sampled, gave the correct answer to all four questions regarding the ESP exercise, while over 80% of respondents mentioned that they personally participated in the ESP exercise.

Finally, respondents who participated in the ESP were asked why they participated in it. Most (74.2%) said they participated to keep their surroundings clean while 5.9% said they participated because they did not want to be fined for breaching the law and about 6.7% said they participated because everyone else does.

Respondents who had earlier indicated that they did not participate in the ESP were then asked to give the reasons why they did not participate. More than half of respondents (59.4%) said they did not participate because they were busy on the days the exercise were held, while a further 27.5% said they had no reason for not participating.

5.6 Summary of findings

The results of this chapter, based on the observation and analysis of the survey questionnaire, are discussed below within thematic frameworks. The emerging themes from the survey have been categorised into groups. The discussion will begin by highlighting the areas of environmental concern amongst households, then comment on perceptions among respondents about where the responsibility lies in addressing these concerns. The next section will highlight issues concerning willingness to pay for waste collection services, while the last two sections will discuss respondents' knowledge and awareness of the ESP as well as the identification of a '*knowledge – action*' gap in waste management behaviour amongst households.

5.6.1 Environmental concerns

The results from the data reported in the earlier sections of this chapter show that respondents in Lagos have expressed seriously their concerns about their

environment and are aware of some problems arising from unsustainable environmental practices. They have ranked issues concerning refuse collection, drainage and flooding as well as wastewater and sewage as the three most important environmental concerns they presently face. Just over half of respondents have indicated that they would be willing to source segregate their waste for efficient waste collection, irrespective of their age, gender, levels of income or education.

5.6.2 Causes of problems and responsibility for action

Most respondents believed that the environmental problems in Lagos can be traced to governance, economic and technical issues. They also feel that the government (both state and local) should primarily be responsible for addressing the environmental problems where they exist.

5.6.3 Willingness to pay

Most respondents indicated that they are willing to pay more for an improved waste collection service and more than half of all respondents believe that the newly initiated private sector participation programme can implement a better waste collection service. Although more men than women indicated their willingness to pay more for an improved service, a higher proportion of women expressed their willingness to pay extra when compared with the male respondents.

5.6.4 Knowledge of legislation

The results from the survey revealed that although most respondents claimed to be aware of the ESP, the analysis of responses showed that these respondents do not possess accurate information concerning all their obligations as contained in the ESP laws. The majority of respondents access ESP information from media sources (Television and Radio) followed by word of mouth.

5.6.5 The knowledge – action gap

Certain trends emerged from the analysis carried out in this Chapter. There seems to be a 'disconnect' between what respondents state as their level of concern for the environment, based on knowledge, and how this translates into

environmental action. A 'knowledge-action' and 'value-action' gap seems to exist among respondents in their interaction with the environment in that environmental knowledge or values, which are reasonably high, do not appear to be good predictors of environmental action. While the quantitative analysis of the survey results in this Chapter does not provide clear reasons for this, the qualitative analysis from the follow up survey discussed in the next Chapter should offer a clearer picture of human-environment interactions in Lagos. Respondents, as indicated previously, show strong sentiments towards environmental problems and are seriously concerned about the impacts of these problems on their lives. On the other hand, there is very little evidence of pro-environmental behaviour by respondents in the state.

5.7 Conclusion

The results of the survey into general attitudes of respondents to selected waste management issues in Lagos state have highlighted certain patterns of behaviour regarding waste management. The study has shown that although there is an appreciation among respondents of the impact of poor waste management practices on the environment, there is little evidence of respondents being proactive in addressing the waste management problems they face. While the questionnaire based quantitative surveys cannot be relied upon to give a convincing portrait of respondent waste management behavioural patterns, it sheds light on what the values and intentions of respondents are towards waste management and in particular, pro-environmental behaviour. As mentioned earlier, there is a strong affinity for the pro-environmental intent across all demographic and socio-economic variables. While this has been established, the physical evidence of anti-environmental activities as shown through the dumping of wastes in storm drains, illegal and improper waste disposal methods as well as general street littering points to a deeper, more complex link between environmental values, behavioural intention and actual environmental behaviour.

The results discussed in this chapter provide a fair picture of the respondent views on the waste management situation in Lagos as of July 2007. In addition to this, if the ESP, as sampled in this chapter, is used as an indicator for how environmental agendas are set and conveyed to the public, then the evidence from this survey suggests that the approaches by the government in Lagos State

have not been effective in influencing desirable pro-environmental behaviour, neither are the obligations of respondents being communicated, received and understood in their entirety.

Further investigation is needed to understand the factors that influence environmental values, environmental intent and environmental behaviour among respondents in Lagos. The barriers influencing the knowledge–action gap and consequently, pro–environmental behaviour among respondents in Lagos will be discussed in contextual detail in the next Chapter.

What I don't understand about myself is that I decide one way, but then I act another, doing things I absolutely despise.

- *Romans 7:15. The Message Bible*

CHAPTER 6. FACTORS INFLUENCING WASTE MANAGEMENT BEHAVIOUR

6.1 Introduction

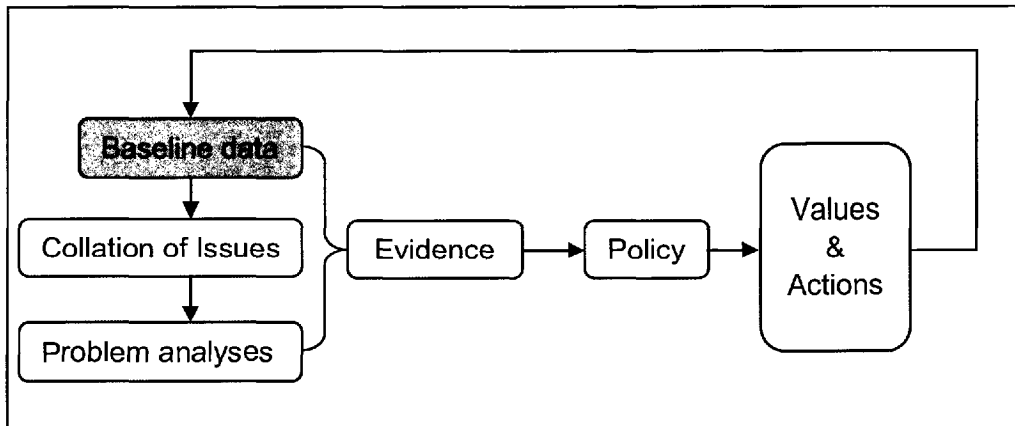


Figure 6.1 Flow chart showing the acquisition of qualitative baseline evidence

6.2 Profile of Participants

A total of 53 participants were involved in all the focus group sessions combined, including the pilot study. The sections below present the breakdown of some of the results from the questionnaires completed by participants before each focus group began. These are then put beside the results from the 2007 survey for comparison.

6.2.1 Age

The 2008 sample had a much higher representation of respondents below the age of 24 (Table 6.1). This was mainly because there were three focus group sessions that had a high proportion of respondents in that category: the pilot session, the secondary school students and the university undergraduates.

6.2.2 Gender

The gender representation still maintains the pattern of higher males than females with the 2008 sample when compared with the 2007 sample (Table 6.2).

This figure though is much closer to the official population distribution figures listed by the Lagos state government (51.9% Male and 48.1% Female).

Table 6.1 Age

| Variable | 2008 Values | 2007 Values |
|--------------|-------------|-------------|
| 24 and below | 48.1 | 17.1 |
| 25 - 34 | 26.9 | 38.5 |
| 35 - 44 | 15.4 | 29 |
| 45 - 54 | 0 | 11 |
| 55 - 64 | 9.6 | 3.5 |
| 65 and above | 0 | 0.9 |
| Total | 100 | 100 |

Table 6.2 Gender

| Variable | 2008 Values | 2007 Values |
|----------|-------------|-------------|
| Male | 56.6 | 62.2 |
| Female | 43.4 | 37.8 |

6.2.3 Household income

Two groups were excluded from this section: secondary school students and the market stall concessionaires. It was reasoned that the secondary school students would not be in a position to estimate their households' annual income and the market stall concessionaires may have difficulties in estimating annual incomes from businesses that are largely informal. The results (Table 6.3) show that as with the 2007 survey, most of the respondents sampled had annual household incomes of below ₦ 15 million a year (about £60,000) close to half of the entire sampled reported annual household incomes of below ₦ 2 million (about £8,000).

Table 6.3 Household Income

| Variable | 2008 values | 2007 Values |
|------------------------|-------------|-------------|
| Below 2 million naira | 45.2 | 58.2 |
| 2 - 15 million naira | 41.9 | 36.4 |
| 16 - 50 million naira | 9.7 | 4.8 |
| Above 50 million naira | 3.2 | .7 |
| Total | 100 | 100 |

6.2.4 Environmental perceptions

Respondents mentioned waste disposal issues as well as issues regarding drainage and flooding as the two greatest environmental problems faced in Lagos. When these results were weighted, averaged and compared with the results from the previous year's survey, the top two mentioned problems appear in the same order (Table 6.4) The results from the first two questions (See Appendix B-6) shows that issues of refuse collection (darker shade), on one hand, and drainage and flooding (lighter shade) on the other are still perceived as the two greatest environmental problems that people who live in Lagos face. When compared with the results from the previous year's data, that of 2008 shows an increase in the number of respondents who perceive waste management as a significant environmental problem. While this makes for interesting reading, it should be noted that there may be an element of bias in the responses of respondents owing to the title of the research topic they were already introduced to.

Table 6.4 Main environmental problems

| Variable | Rank 1 | | Rank 2 | | Average | Average |
|-----------------------|--------------|--------------|--------------|--------------|---------|---------|
| | 2008 | 2007 | 2008 | 2007 | | |
| | Results % | Results % | Results % | Results % | 2008 % | 2007 % |
| Drinking water | 2 | 7.6 | 7.1 | 9 | 4.6 | 8.3 |
| Sewage and wastewater | 4.1 | 17 | 0 | 13 | 2.1 | 15 |
| Bad roads | 0 | 13.3 | 4.8 | 11.9 | 2.4 | 12.6 |
| Drainage and flooding | 18.4 | 22.2 | 35.7 | 18.3 | 27.1 | 20.3 |
| Electricity | 6.1 | 14.8 | 0 | 14.3 | 3.1 | 14.6 |
| Waste issues | 53.1 | 23.9 | 33.3 | 31.7 | 43.2 | 27.8 |
| Air pollution | 12.2 | 1.1 | 11.9 | 1.5 | 12.1 | 1.3 |
| Noise pollution | 4.1 | 0.2 | 7.1 | 0.2 | 5.6 | 0.2 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 |

6.2.5 Responsibility for problems

As with the previous year's result, respondents said they felt that the Local and State Government, followed by individuals, ought to be responsible for addressing the environmental problems. It is noteworthy to mention here that there is an upward trend in the 2008 survey data when compared with those of 2007 in the number of respondents who believe that the Government should be primarily responsible for addressing the environmental problems.

Table 6.5 Responsibility for environmental problem

| Variable | First Group | | Second Group | | Average | Average |
|----------------------------|-------------|-------------|--------------|-------------|---------|---------|
| | 2008 | 2007 | 2008 | 2007 | | |
| | Values % | Values % | Values % | Values % | 2008 % | 2007 % |
| Don't know | 0 | 0.9 | 0 | 3.1 | 0 | 2 |
| Nobody | 0 | 3.4 | 0 | 4.7 | 0 | 4.1 |
| Individuals | 23.1 | 24.1 | 28.6 | 21.9 | 25.9 | 23 |
| Local community | 1.9 | 14.7 | 11.9 | 20.8 | 6.9 | 17.8 |
| Local and state government | 73.1 | 52.9 | 54.8 | 39.6 | 64 | 46.3 |
| Private sector | 1.9 | 3.9 | 4.8 | 9.9 | 3.4 | 6.9 |
| Total | 100 | 100 | 100 | 100 | 100 | 100 |

6.2.6 Waste service delivery and littering

Respondents in both survey years feel that refuse (household waste) collection as well as illegal dumping of wastes and street littering are serious problems in their areas (Figures 6.1 and 6.2). There appears to be a positive correlation between how serious waste collection is perceived as a problem and, consequently, how serious the problem of illegal dumping of waste and street littering is.

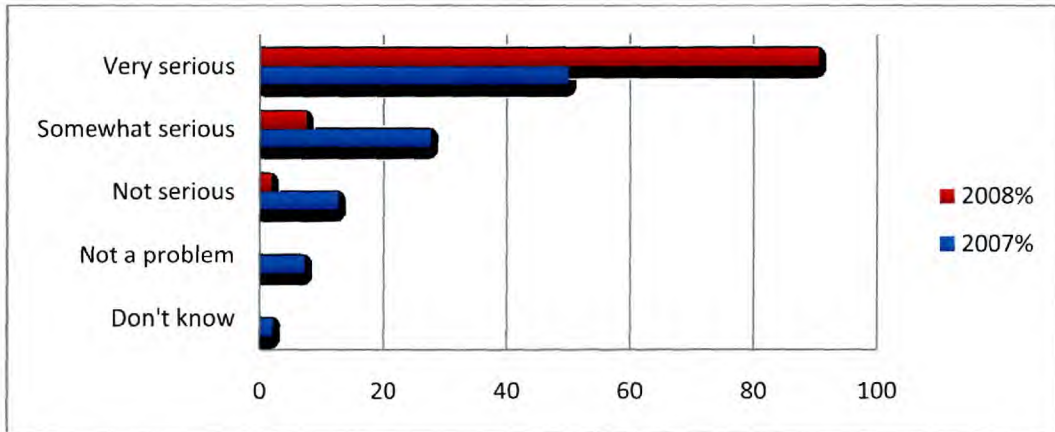


Figure 6.2 How serious is the problem of refuse collection in your area

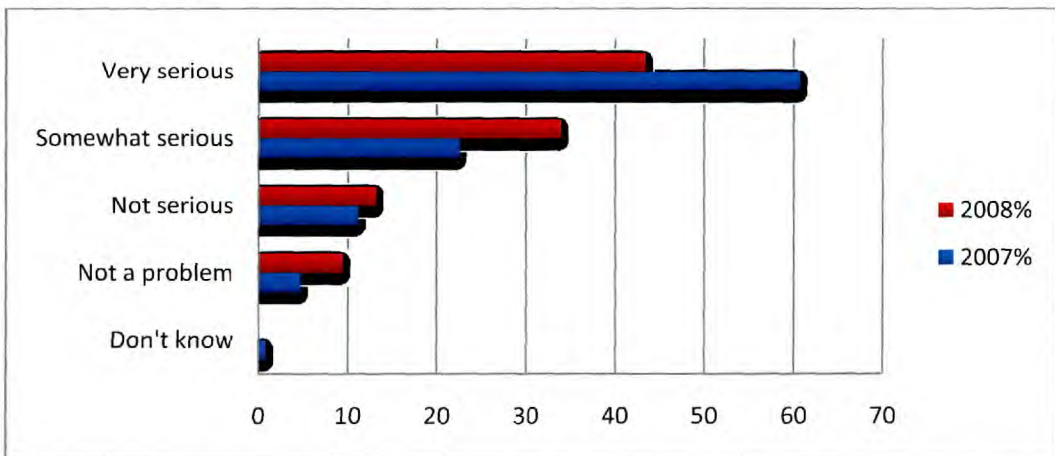


Figure 6.3 How serious is the problem of street littering and illegal dumping of refuse in your area

6.3 Qualitative results

6.3.1 Waste disposal methods

The top waste disposal method mentioned by respondents in the previous year's questionnaire was the use of informal (private) sector cart pusher collection services (See Appendix B-7). At least 53% of respondents from the 2007 survey mentioned that cart pushers were their main conduit for waste disposal. These cart pushers, as explained in earlier sections are unlicensed, and though they form part of the private sector, are informal and are therefore not regarded as being part of the Private Sector Partnership programme for waste management in Lagos State. The utilisation of these cart pushers flies contrary to the Lagos State Environmental Sanitation Laws which dictate that 'No person shall dispose of

domestic refuse or waste except through a Private Sector Participation Operator' (Lagos State, 2001).

Respondents from the focus group discussions validated the results from the 2007 survey by also claiming to use the services of cart-pushers and gave various reasons for the continued use of their services. Reasons respondents gave for their patronage of cart pushers included convenience, as the authorised PSP services were irregular or non-existent in some areas. Participants said that they use cart pushers even in some cases where the cost of their services was more than the regular PSP service. This, they claimed, was preferable to the PSP service because even though the cart pusher service might be a more expensive option, it was regular and they did not have to worry about collection times and schedules. Some respondents complained that even though they had heard from their neighbours that PSP waste collection trucks came round, the frequency of service was irregular and some collection routes were often skipped, while some other respondents mentioned that they had never seen the collection trucks before. The prevalence of informal sector involvement in waste collection services corroborates the 2006 World Bank report that put informal waste collection service use by households at about 39%.

A few participants said that they were satisfied with the PSP service that they were receiving and only seldom used the cart pushers as a 'back up' in situations where the PSP collection trucks did not come round. Almost a quarter of respondents from the 2007 survey mentioned that they patronised PSP waste collectors exclusively (see Appendix B-7). Though the 2007 survey results showing this claim may be true, the focus group revealed that even among the group of people who patronise PSP exclusively, there remains an ad hoc cart pusher service in place in most households for the occasions when the regular PSP services fail.

The major case made against the informal (private) sector cart pushers by the Lagos State government is that they are a major contributor to illegal dumping of wastes on roadsides, in storm drains and rivers. Householders acknowledged this hazard during discussions and were aware of their consequent environmental impacts when the issue was put to them, but they insisted that the practice of patronising cart pushers, though illegal, and in some cases, environmentally detrimental, remained their only viable option for managing

household wastes in light of the issues they had already raised about the PSP system.

'I have never seen any PSP operator in my neighbourhood. I know it's wrong because I know it ends up being dumped illegally; most of the illegal dumpsites are created by these people [cart pushers], but I don't think I have an option.' (FG0501)

In summary, householders expressed a satisfaction with the waste services offered by both the PSP and cart pushers, depending on the services they predominantly used. However, the PSP service is perceived as a failure and a nuisance that has yet to deliver equal services across the state by householders in underserviced areas. Householders in underserviced areas have taken it upon themselves to seek the services of informal sector cart pushers, knowing full well the risk their activities bear on the environment, because they do not feel they have any other options.

'In my area (Adeniyi Jones) [a major residential area in Lagos] there is no PSP so we patronize cart pushers.' (FG0301)

The issue of waste separation, while not on the current list of critical issues for waste management in Lagos, as has been discussed in earlier sections, was presented to the groups. The almost even response regarding this issue from the 2007 survey (see Appendix B-8) was explored among the participants and most mentioned that they were not willing to separate their waste (this was clearly a misconception as when the subject of itinerant waste buyers was brought up later on, many said they did separate items for sale or donation to the itinerant waste buyers). Participants mentioned issues of; time, convenience, no clear legislation obliging them to do so, the insignificance of the act and also that other people do not do it.

'I don't separate waste because there's no time to separate waste.'
(FG0501)

Some participants felt that the coverage of the PSP service was selective and that higher income groups received a more regular service. These results reflect

a mix of behavioural variables that influence household waste separation behaviour.

6.3.2 Littering

Respondents from the 2007 survey expressed the perception that street littering and illegal dumping were very serious problems in the areas where they lived. This is corroborated by media articles highlighting the blight of waste dumps and the regular incidents of flooding caused by debris blocked storm drains in Lagos. (see Box 8.5)

Over 60% of respondents during the focus group sessions reported that littering and illegal dumps constituted serious problems in their area (Figure 6.2), however, this perception seems to be directly related to the areas where the respondents live because during the focus groups, while a few respondents agreed with littering and illegal dumping being a problem where they lived, some respondents who lived in higher income areas reported that they had no such issues. They stated that because they live in secluded and sometimes gated communities or estates, they had private waste contractors collecting wastes from households and regular security patrols that discouraged illegal waste dumping. They also reported that the presence of security personnel discouraged cart pushers from operating within their communities.

When respondents were asked why they felt that littering was a problem, they mentioned issues like: visual eyesore, the odour emanating from dumps, the risk of flooding and the health risks they pose.

Respondents were then asked to comment on why they believed 'people' litter. The responses given were varied and provided insight into perceptions of householders towards this issue. The quotes below represent sentiments raised during these sessions and underscore the complexity of variables involved in waste behaviour. First, respondents made mention of personal reasons why people litter; they mentioned the lack of appreciation for the environment, poor social responsibility attitudes and illiteracy.

'People don't feel a responsibility towards the environment. Back home I don't think people associate dumping to hurting themselves.' (FG0103)

People aren't concerned about the environment because they may have other priorities. It's just inconvenient. People aren't thinking of their health or the effects the waste has on other things e.g. flooding. (FG0101)

'It's there. People do it. Even people who should know better throw it into 'established' (illegal) dumps. During WAI (War Against Indiscipline), people were better [behaved]. Enforcement should improve and [Government should] provide bins.' (FG0106)

Other issues raised include; ignorance, ineffective legislation and enforcement by government, population congestion (Urban planning) and poor information dissemination by government.

'I think people are just indifferent. They don't care about the effects; they just want to get rid of waste.' (FG0104)

'I think there's not enough sensitisation about the health effects of poor waste management practices.' (FG0102)

Another reason given by residents was that the current habit of illegal littering and street dumping was prevalent in Lagos today because people do not perceive their behaviours as being anti-environmental and they do not have an ideal behavioural target to aim for.

'People don't see anything bad in anti-environmental behaviour because they haven't seen anything different [to aspire to].' (FG0506)

Following on from this theme, participants were then asked if they litter and why? Those who reported that they litter primarily mentioned practical issues like the lack of bins and the inconvenient locations of waste facilities as the reasons for their behaviour.

'Yes [I litter], because there are no bins and there is no provision for adequate facilities.' (FG0401)

'Street-side traders sweep their surroundings and THEN dump the wastes in illegal dumps because there's no other place for them to dump it. If there's a bin, they'll put it there, but if not they'll dump it.' (FG0106)

'Yes [I litter]. Bins available are not well maintained and are unsightly.' (FG0206)

Respondents who reported that they did not litter mentioned personal reasons why they did not do so. Respondents made mention of parental influences as well as how their actions would be perceived by neighbours.

'No [I do not litter]. I was brought up not to litter the environment.' (FG0207)

'No [I do not litter]. I don't want to be seen as a social menace.' (FG0204)

In addition to questions about the causes of littering and their own littering behaviour, participants were asked to propose suggestions about how littering may be curtailed. Respondents listed various suggestions, among them were: the need for government to provide more bins and also involve community development associations in drafting and enforcing waste legislation, the need for more environmental awareness campaigns by the government and the stepping up of enforcement of waste legislation.

One interesting point to note from the quotes above, and was a common observation during all sessions, was that respondents never mentioned how they could personally change their habits, even amongst respondents who had reported that they litter. This may lead to the conclusion that individuals are not fully aware of their power to personally change their habits; rather they have been conditioned to rely on the external influence of legislation and social enforcement to improving their behaviours. While respondents who litter mentioned the provision of bins to mitigate littering behaviour, no one mentioned that they could choose not to litter anymore for personal reasons.

6.3.3 **Waste legislation**

The Environmental Sanitation Programme (ESP) was used by the researcher to test attitudes towards waste legislation. During the focus group discussions,

respondents were asked to comment generally on the current ESP and its effectiveness in addressing waste management problems in Lagos. Of the six group sessions held, only two (FG03 and FG06, Secondary school children and Market stall concessionaires) had a majority of respondents reporting in the affirmative that they participated in the exercise.

Respondents from FG03 reported that they participate because they believe clean environments prevent flooding and also because their parents made them clean up their surroundings during the exercise. Respondents from FG06 said they participated in the ESP because they believe in clean environments for their patrons and potential customers to shop in. They also mentioned that they were bound by strict regulations, enforced by the elected market head, to maintain clean surroundings around their concessions and the penalty for default was a forced lengthy lockdown of any erring concessionaire. Members from the other four groups responded mostly that they did not participate in the ESP. One member from FG02 mentioned that he used to participate in the 'old' incarnation of the ESP (pre 1999). Respondents mentioned a lack of available time to dedicate solely to cleaning their surroundings and also some respondents mentioned that since they cleaned their surroundings quite regularly, they did not feel the obligation to dedicate a single three hour period (the duration of the exercise) every month to doing the same thing.

Respondents from FGs 01, 02, 04 and 05 expressed a general dissatisfaction with the ESP in its current form. It was the general opinion of respondents that the programme was ineffective in addressing prevailing waste management issues for various reasons. Some respondents mentioned that the effort of cleaning their surroundings on that day is usually nullified because the wastes cleared from storm drains and surroundings are not promptly collected by waste collectors and usually end up being blown or washed back into drains during the rainy season. However, one respondent made mention of a 'partial' benefit of the programme in raising public awareness of waste management issues. There was also a consensus that the source of information regarding households' obligations during the sanitation period was mainly through word-of-mouth and there appeared not to be a targeted campaign by the government to sensitise the public.

Respondents from FG06 (Market focus group) expressed a satisfaction with the programme, although this was contextualised in a commercial setting and not necessarily their view of the programme in their respective homes.

6.3.4 Willingness to pay

Participants of FG05 principally agreed that they were willing to pay for household waste collection provided the service was regular and collection times convenient. This corroborates the earlier findings from the quantitative survey observed the previous year. Participants' opinions were divided as to what the current arrangements for waste collection in their residential areas were. Some participants believed they were supposed to pay the collection fees to the State Government, while some others believed the service was free and others were not entirely sure what the arrangements were.

'I have not been paying, I really am not sure why, but perhaps the Government is paying.' (FG0503)

Some participants stated that they believed that waste collection services would improve if householders paid regularly, but they also mentioned that they could easily switch back to the waste cart pushers if the private waste collection service did not meet up to their needs.

'I think if we pay, they'll [PSP] come regularly – 3 times a week. If not I'll use the cart pushers.' (FG0505)

6.4 Closing statements

The final round of discussions required participants to propose suggestions that may improve the waste management situation in Lagos. This section was aimed at allowing participants to comment on aspects of waste management in Lagos that they feel need to be addressed as a priority. Participants were allowed to develop themes individually and collectively, although the same general rule of no coercion and freedom of having differing opinions was maintained. Three key themes emerged from this section and they are summarised below.

6.4.1 Legal

Participants mentioned the lack of adequate enforcement of waste legislation as a major problem for waste management in Lagos. They recommended an improved enforcement system for waste legislation as well as the institution of significant penalties for offences. It was observed during FG05 that another problem with legislation of waste management in Lagos is the lack of continuity in the Government's waste policies. It was recommended that the Government should seek to maintain consistency and continuity in its waste management policies.

6.4.2 Social

Closely related to the legal issues raised were the social issues that respondents mentioned during the final discussions. Participants agreed that there was a lack of information about waste legislation and management programmes. Respondents mentioned the need for the Government to develop educational programmes to enlighten the public about waste policies and management issues. One respondent from FG01 mentioned that she believes the media have a powerful influence on behaviour. She cited an example of the 'Willie Wimple' cartoons from *Sesame Street*, a show by the *Children's Television Workshop* she used to watch as a child on television and how it has influenced her waste disposal habits. Some respondents also mentioned the need for Government to tie waste management to relevant concerns like healthcare and flooding to encourage a buy-in of waste programmes by the public. Individual behaviour was also mentioned when some participants in FG05 suggested that individuals needed a reorientation on their environmental behaviour. The issue of corruption was also raised during the session and respondents suggested that there should be proper monetary incentives for waste collection workers as well as legal enforcement officers. The participants were of the opinion that this group of stakeholders in the waste management system were poorly compensated for their work and perhaps this is why their service levels are not consistently adequate.

6.4.3 Technical

Finally, participants mentioned the dearth of waste bins and collection vehicles in their areas as part of the main problems they faced. They recommended that the government should provide bins as well as a frequent waste collection service. They also recommended that the government should incorporate the itinerant waste buyers as well as the cart pushers into the existing PSP programme. They reasoned that since the operations of cart pushers are not hindered by inaccessible roads; they could help out with collection of wastes from areas inaccessible to waste collection vehicles.

6.5 Summary

The research, through appropriate methodology and inference, confirms the earlier quantitative results that highlighted strong awareness of environmental problems by householders (see Chapter 5) as well as a clear appreciation of the negative consequences of most anti-environmental behaviour. This evidence was also demonstrated during the focus group sessions when the issues of street littering and the alleged practice of illegal dumping of refuse into drains and waterways by waste cart pushers were discussed.

Evidently, various factors emerged as having influence on household behaviour towards the targeted issues discussed during the focus group sessions.

6.5.1 Waste disposal methods

The main factors that influence waste disposal methods in Lagos are mostly practical variables. Issues of convenience, quality and frequency of service as well as appropriate information dissemination and service content were largely responsible for household behavioural decisions. There were some cases where, though personal variables were evident in the values held by some householders, their actions were overridden by higher ranked practical variables. A case in point was an instance cited by one of the respondents who mentioned she used the services of 'illegal' cart pushers knowing the negative environmental consequences of their actions (cart pushers in her area dump collected wastes into storm drains and canals).

6.5.2 Littering

Street littering generated the highest volume of discussion among participants in all the focus group sessions and rightfully so. Littering remains the most visible impact of poor waste management systems in Lagos as in most developing countries and is, consequently, a reflection of anti-environmental behaviour. Even though there is evidence of high pro-environmental values amongst householders, other variables come into play which eventually influences behaviour. Respondents frequently mentioned practical and situational issues such as the lack of facilities to dispose of the waste properly and a lack of time and the inconvenience involved in looking for bins in which to drop wastes while on the move. While these issues may be immediately remedied through practical means like the provision of street side bins, the underlying societal norms and social conditioning, which may have evolved as a result of the dearth in adequate waste facilities, and which also appear to condone anti-environmental behaviour, may take much longer to rectify.

6.5.3 Knowledge of waste management initiatives

There is a clear gap in householders' information on waste management initiatives. Participants mentioned a lack of detailed information on some initiatives, particularly the ESP, PSP waste collection scheme and the directive on cart pushers. Some participants were not aware that the operations and patronage of cart pushers were illegal, while others were not aware of the operation of PSP services or their collections schedule for their area, but had to rely on second hand information from neighbours.

The highlighted issues represent a summary of the findings from the focus group survey and the wider implications of the results in this chapter will be discussed in Chapter 7, where the interplay and interrelationship of the variables that influence environmental values on the one hand and environmental behaviour on the other are discussed.

CHAPTER 7. BARRIERS TO PRO-ENVIRONMENTAL BEHAVIOUR

7.1 Introduction

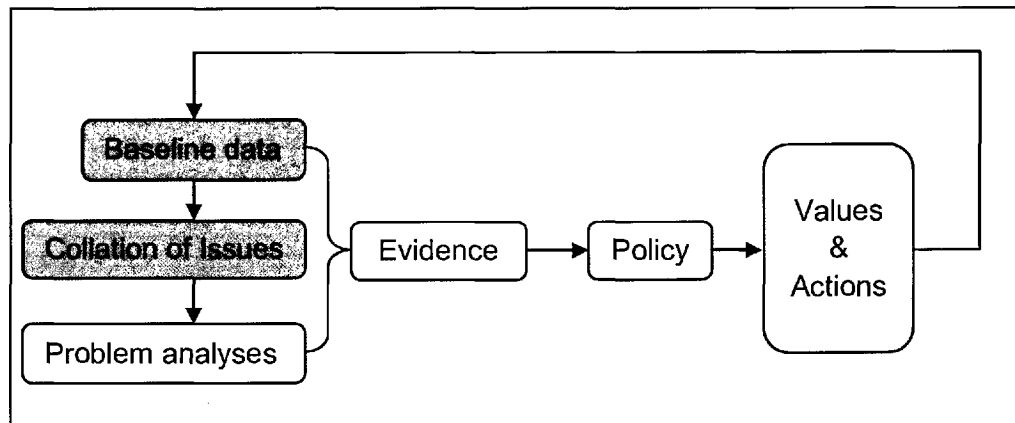


Figure 7.1 Flowchart showing the collation of issues derived from baseline evidence

The previous two chapters made use of quantitative based questionnaires and qualitative focus group sessions to elucidate the main environmental problems as perceived by residents in Lagos as well as their attitudes and reported behaviour towards current waste management policies. This chapter builds on the knowledge acquired from the combination of these surveys to test the hypothesis that the exclusion of householders from waste management policy formulation has compromised the success of waste management strategies in Lagos and concludes by highlighting priority areas which need to be addressed by waste management policy makers in Lagos.

The major perceptions and attitudes of householders towards the environment are discussed as well as how these have influenced or differ from their reported waste management behaviour. The sections below have been separated into two complementary groups of results: section 7.2 begins with the 'what' results, being the reported perceptions and actions of households to the selected waste management issues. Sections 7.3 and 7.4 then follow up with the 'why' questions, highlighting the factors that underpin the reported behaviours and perceptions expressed in section 7.2. The combination of these results presents a clearer picture of the current attitudes and perceptions of householders in

Lagos to key waste management issues as well as a broad but structured analysis of the main factors that influence these perceptions and behaviours.

7.2 Baseline of Householder Perceptions and Attitudes

The reported perceptions and attitudes of householders to the selected waste management issues obtained through the quantitative and qualitative surveys are discussed in the sections that follow. The main responses collated from the two surveys are presented below along thematic lines. The areas covered include; householders' general awareness of the environment, perceptions about environmental responsibility, the value – action gap as well as knowledge and awareness of waste legislation. This analysis represents the first attempt to document baseline information on the attitudes and reported behaviours of householders in Lagos to waste management issues as well as the main factors that influence them.

7.2.1 What are the Areas of Environmental Concern?

The surveys revealed that most residents were concerned about the state of the environment in Lagos. Residents expressed a general awareness and knowledge of the links between poor environmental practices and their consequent effects on the environment. This finding is not necessarily self explanatory; however, when it is combined with the associated question of 'which area of the environment elicits your greatest concern?', a clearer picture of the specific environmental issues which residents are most concerned about becomes apparent.

Issues related to waste management as well as drainage and flooding were the most frequently mentioned environmental problems in Lagos. These issues represent, in summary, the major environmental issues that have raised high levels of concern among householders in Lagos. Furthermore, a relationship may be drawn between these issues as poor waste management systems, in the forms of service delivery or end user behaviour, may contribute to the problems of illegal waste dumping where, in some cases, the waste gets dumped directly into storm drains or washed into storm drains during the rainy season. This accumulation of wastes in storm drains may lead to sporadic incidents of flooding in various parts of the state (see Picture 7.1). Sewage and wastewater is a major

(but perceived as a lesser) problem in Lagos, primarily because there is no integrated sewage system covering the state – which may be traced to the foundational urban planning structures set up during the colonial administration discussed in Chapter 2.

The waste management issues highlighted by residents may be divided into two groups, namely, household waste disposal issues on the one hand and street littering on the other.



Picture 7.1 Flooded street in Lagos.

Source: Araba, 2008.

Householders in Lagos have, broadly speaking, 3 main options for waste disposal (collection) namely:

- a) The Private Sector Participation (PSP) collectors
- b) Dumping or burning and;
- c) Informal sector cart pushers

Schedules 7 and 15 (1) (a) of the Lagos State Environmental Sanitation Law (see Appendix C-1) state respectively that:

7. No persons shall dispose of domestic refuse or waste except through a Private Sector Participation Operator and;

15 (1) (a). No person shall burn or bury refuse on any tenement or open place

By implication, these legal provisions render the last two waste disposal (collection) options, available to householders, illegal.

The surveys revealed that generally, PSP collection services were in operation within the metropolitan areas, while peri – urban areas remain severely underserved. Notwithstanding, residents in urban areas where there were irregular PSP services still maintained regular cart pusher collection services. It becomes clear that the issue of waste collection is the immediate problem facing the management of household waste in Lagos. The primary reason why much household wastes end up being dumped, buried, burned, or disposed of through cart pushers, may be directly related to the availability or quality of household waste collection services provided by the PSP. It was highlighted in Chapter 6 that householders mentioned that they felt the service quality provided by PSP operators varied from one location to another, in that higher income neighbourhoods received better levels of service than lower income neighbourhoods. This focus group observation was corroborated by the researcher over the two survey years where the near non-existence of cart pusher operations was noted in some high income neighbourhoods like Victoria Island, Ikoyi and most parts of the Lekki peninsula. Lagos State Waste Management Authority (LAWMA) also corroborates this deduction by linking the presence of efficient PSP services in high income areas to the elimination of cart pusher operations as well as the reduction in volume of dumped wastes (Olumide, 2007).

Poor household waste disposal habits contribute to street littering, but they do not constitute its sole source. It should be mentioned that the littering of public spaces or the accumulation of solid wastes on streets, roadsides, storm drains and natural water ways are largely from three main sources:

- a) Illegally dumped household wastes

- b) Direct street litter and solid wastes from street trading where most of the plastic, 'pure' water bags that block the storm drains come from and;
- c) Waste from other commercial sources.

The proportion that each of these sources contributes to the final volume of what ends up on the streets in Lagos was not investigated in this study. The focus group sessions revealed, through reported behaviour, that littering was a function of various factors and these are explained contextually in Section 7.3 which deals with the factors that influence environmental behaviour.

7.2.2 Whom do householders blame for the environmental problems?

Householders largely attributed the causes of the most pressing environmental problems to issues pertaining to governance, economic issues, anti-environmental behaviour and technical issues, in that order. They ascribed most of the blame to the government and the various waste management systems adopted by them over the years. This observation is backed up by studies which have shown that underlying issues of corruption, shifting environmental policies and improper urban planning by the government have significantly influenced the perceptions of households on governance (Onibokun, 1999 and Oyeyinka, 2006).

Economic issues, in this context, are perceived in two ways by householders. First, they refer to the inability of service providers to finance adequate waste management systems and secondly, they also refer to householders' ability to pay for waste services. Householders empathise with and appreciate, to some extent, the challenges faced by the government to provide adequate waste collection vehicles and also the challenges faced by fellow householders in taking care of their own household waste. They feel some people litter and dump wastes not because they do not know better, but, perhaps more importantly because they cannot afford the costs associated with waste collection (disposal) services offered by the PSP.

Interestingly, anti-environmental behaviour was ranked below governance and economic issues by householders as a cause of the environmental problems in Lagos. This finding implies that householders believe their environmental

behaviour is not an immediate contributing factor to the failure of the waste management system. However, the acknowledgment of anti-environmental behaviour, as one of the 3 major causes of environmental problems by householders, validates the assumption of the existence of gaps between how people feel about the environment, as evidenced by their reported high regard and concern for their environment, and their (sometimes poor) environmental behaviour. This phenomenon is frequently described as the value–action gap (Blake, 1999) and is explained further in Sections 7.3 and 7.4 below.

7.2.3 Waste legislation knowledge and awareness

The Environmental Sanitation programme (ESP) was used as an example to explore the wider issues of household legal compliance with environmental legislation. Householders' levels of knowledge and awareness of their legal obligations under the ESP increased with the level of education of respondents. The survey results show that, despite its shortcomings, the social campaigns that followed the original roll-out of the ESP, as part of the War Against Indiscipline (WAI) programme of the mid 1980s (in Lagos), were successful in 'conditioning' environmental behaviour and increasing householder knowledge of environmental regulations. The gradual return by householders to anti-environmental behaviour after the termination of the WAI campaigns in Lagos suggests that, even though the WAI campaigns were successful in changing behaviour in the short term, they have had no long term impact on behaviour, implying that pre-WAI behavioural intent has not changed. The incentive or intent to behave in a pro-environmental way during the years of the WAI programme seems to have been influenced more by the threat of punitive fines and corporal punishment to defaulters than the launch of enlightenment campaigns to increase knowledge and awareness of the negative effects of anti-environmental behaviour.

7.3 Determinant factors for waste management behaviour

Much has been written on the emergence of the value–action gap in environmental behaviour and policy (Blake, 1999; Kollmuss and Agyeman, 2002; Barr, 2006; Fahy, 2006). Studies have shown that reported high environmental concern and awareness does not immediately translate into pro-environmental behaviour (Burgess et al., 1998; Owens, 2000; Kollmuss and Agyeman, 2002).

This leads to the conclusion that information / knowledge about issues may not have as strong an influence in how householders behave as the current policies of the Lagos State government may assume. The emphasis on media sensitisation and awareness programmes by the government, utilising the information deficit model explained in Chapter 3, may suggest that effort at influencing behavioural change through this method may prove unsuccessful if there are stronger factors influencing behaviour.

7.3.1 **Reported 'thinkers' but not practical 'doers'?**

In addition to most householders expressing high concern for the state of their environment, they were also able to identify the immediate perceived threats to it. Qualitative analysis revealed that most householders were aware of what was the 'right' thing to do and, in most cases, knew the 'correct' actions to take when managing their waste but, however, they reported acting contrary to their held beliefs or reported values (see Section 7.4.4 below). This suggests that there are other contextual factors that influence environmental behaviour.

Blake (1999) identified three main barriers between environmental concern and environmental action. He stated that practicality, responsibility and individuality were largely responsible for influencing an individual's intent to act, especially in individuals with low levels of environmental concern. The study revealed that even in cases of reported strong environmental concerns among households, there were still other variables that ultimately influence their behavioural intent, a finding which was also made by Kollmuss and Agyeman (2002). From the focus group sessions, there were householders who had strong environmental concerns but, because the PSP service in their locality was poor and / or irregular, they still openly burnt waste in their backyard or dumped their wastes in storm drains knowing that a potential consequence of this particular action may lead to blocked drains that cause flooding. In these cases, the practical *need* of 'getting rid of household waste' outweighed their high levels of environmental concern. This suggests that the relationship between environmental concern and environmental behaviour is weak at best and that environmental concern, in isolation, may be a good indicator of behavioural intent, but is not a good indicator of eventual environmental behaviour.

7.4 Explaining the 'gap'

The models that attempt to explain the various factors that influence human environmental behaviour are numerous and most of them agree that the relationship between attitudes, values, behavioural intent and how they influence environmental behaviour is a complex one (Taylor and Todd 1997; Blake, 1999; Barr, 2002; Kollmuss and Agyeman, 2002; Fahy, 2006). While these models have utilised different approaches in segmenting the factors responsible for environmental behaviour, none has succeeded in explicitly stating what constitutes 'good' or pro-environmental behaviour, rather the interpretation is left largely in the hands of the researcher.

To avoid ambiguity in the interpretation of the findings of this research, 'pro-environmental behaviour' in the context of this research refers to behaviour that encourages actions that avoid the waste management problems highlighted in the previous chapter – open burning of wastes, illegal dumping of wastes as well as street littering and implicitly, encourages the adherence to environmental regulations in Lagos.

Excerpts of selected newspaper articles, reviewed in the course of this research, have been inserted into the discussions below to provide a validation of the baseline data derived from the qualitative and quantitative surveys. The classification method discussed in Chapter 3 is used to explain, in the following sub-sections, the factors that shape household attitudes and behaviour to waste management issues in Lagos.

7.4.1 External factors

A few factors which were more practical in nature were found to influence environmental behaviour with regards to household waste management. The access to and provision of facilities for waste management activities, issues of time or convenience, problems with space to participate in waste management activities, financial costs of environmental behaviour as well as institutional arrangements by the government in the forms of policies and legislation, were found to influence householders' environmental behaviours.

Facilities

Two main issues stand out when considering the influence of facilities on environmental behaviour: access to environmental facilities as well as the provision of the facilities. The presence of facilities, in this case, an efficient waste collection service by the PSP, was an incentive for pro-environmental behaviour and the lack of the service was the main reason for inaction towards pro-environmental behaviour. Householders living in areas with irregular PSP services resorted to utilising cart pusher services, open burning, illegal dumping or other methods to dispose of their waste.

'I'm not sure there are waste management facilities [PSP services] in my area but I am aware of dumping of refuse in storm drains. Sometimes they are burnt by whoever dumps them. During rainy season, the areas around the drains get flooded because the drains are blocked.' (FG0103)

The provision and access to facilities is also a strong barrier or incentive for environmental behaviour concerning street littering. The presence and access to waste bins in public spaces seems to be an incentive for pro-environmental behaviour. However, this assumption cannot be verified until such provisions have been made by the government.

'...They dump their wastes illegally in streets because there's no other place to put it. If there's a bin they'll put it there, if not, they'll dump it.' (FG0106)

Time

The issue of time is closely related to the sentiments raised by householders regarding the provision of facilities. Householders complained about the scheduling of PSP collection times as reasons why they were not using the service (see Box 7.1). The PSP services do not currently operate a scheduled waste collection service. They operate on specific collection days of the week, as indicated on collection stickers displayed on gates of residential properties, which are not time specific. The collection time is not specific because of various logistical issues involved in rendering collection services ranging from:

- i. The size of collection vehicles compared to the volume of waste to be collected from households - necessitating frequent round trips to the landfill site when full
- ii. Some neighbourhoods not having good roads for vehicular access
- iii. The absence of kerbs on most roadsides for households to place their bins for waste collection

Box 7.1 Householders' complaints about PSP system

'Immediately they sighted the truck going slowly to its usual spot, little Halima Ahmed, Bidemi Oduoye, Chisom Okeke and others emerged from their homes with dustbins of different shades and sizes. They began their weekly marathon race to chase the truck driver to its location. To their surprise, there were already 10 people already on the queue to empty their refuse bins. This is the agony of residents who patronise Private Sector Participation (PSP) in Yusuf Esan Street in Amukoko area of Orile, Lagos State

They have to look out every Monday morning for the only PSP contractor to arrive to enable them empty their waste-bins, but not without joining the long queue.

The problem started when push-carts in the area were chased away with anticipation that the PSP would be able to cover all the areas. No sooner than the push-carts left than PSP operators started to reduce gradually. Many of them could no longer bear the cost of maintaining their trucks and so backed way. Some started coming sparingly after three weeks or monthly. For those who could not queue for the few PSP, they have no alternative than to dump their waste indiscriminately.'

When Lagosians queue for PSP trucks (excerpt)

This issue of time is a major reason why some households do not participate in the PSP. The inability of the PSP to operate on a scheduled timing regime is certainly a major factor in influencing participation in areas where the service is available.

Space

As a complementary factor to time, the space to store household wastes before collection is a major challenge for some households. There are various reasons for this. The types of accommodation which are either, single dwelling, high-rise apartment blocks or large communal compounds influence how much waste may be stored on site.

'We burn refuse because we really don't have a choice. Because of infrequent collection we collect refuse and burn. We live in a communal residence.' (FG0101)

Most dwellings in Lagos are multiple occupancy residences and the space to store waste in between collection times, especially in densely populated areas with smaller communal space, is a significant factor in determining environmental behaviour.

Economic situation

Willingness to pay for improved waste collection services was generally high among all respondents. While financial cost is not currently perceived as a factor in determining environmental behaviour, the ability to pay for the PSP services however may become a factor in the future once direct charging for the PSP services is extended to all areas (presently, a few municipalities are being fully subsidised by the Lagos State Government). Some households oppose the fixed fee regime being proposed by the government for waste collection and suggest a more flexible pay-as-you-throw regime, which is what is used when negotiating disposal (collection) fees with cart pushers.

'The PSP in some areas charge outrageous bills without giving quality service while for the cart pushers householders pay for the amount of waste they produce.' (FG0201)

Households in Lagos that use the services of cart-pushers already operate a PAYT system, albeit, the collection fee is open to negotiation and averages between ₦ (350 – 500) per 200L of waste by volume (typical size of cart used) and this sometimes totals in excess of ₦ 3000 a month (cost of PSP) for larger families.

Public Institutions

Respondents mentioned the ambiguity and constantly changing laws and government directives as one of the reasons for their failure to understand their legal environmental obligations.

'We see government policies ... as directives from government to act and behave in certain ways without knowing why or for what purpose. And the way they go about rolling out these policies [is wrong].' (FG0202)

The institutional capacity of the government to address the issues pertaining to waste management is hampered by various factors, especially the inability of the government to communicate the aim and scope of waste management policies to householders. This is exemplified with a PSP programme trialled in 2007:

Under the guidance of the Lagos State Waste Management Authority (LAWMA), a trial PSP programme was run to encourage householders participate in the programme. PSP operators collected waste from households for free throughout the duration of the trial with the aim of easing householders into the service.

Unfortunately, adequate information was not given to the householders that the free PSP service was a trial and that fees would be introduced after the trial period ended.

Consequently, after the trial period, householders resisted paying for a PSP waste collection service that they had been getting for free and had not asked for (since they had cart pusher services previously).

The failure of the government to communicate the need to graduate to the PSP service to householders could be seen as significant in this instance.

7.4.2 Internal factors

Socio-cultural norms and practices as well as personal experiences have a significant influence on how people behave. The second group of factors which, for the purpose of this thesis, have been labelled as internal factors include, issues of access to information, environmental knowledge, altruism, personal experience, apathy, environmental awareness and environmental involvement. This group of factors reflect the more personal factors that have been shown to influence householders' behaviours towards littering and household waste disposal behaviour.

Information

The information available to individuals plays a major role in influencing their environmental behaviour. Information, in this case, does not appear to bear significant influence on whether householders utilise the legal PSP services or the cart pusher services because external factors currently exert greater influence on decisions; however, householders believe information significantly influences their littering behaviour.

'Government should engage in continuous education and campaigns. Jingles should be catchy and be done in languages to accommodate the diversity of the target audience. Campaigns should involve role models.'
(FG0102)

Respondents felt that a well structured information dissemination campaign, targeted at the right audience could influence public attitude towards littering through focusing on the 'beneficial' dividends of pro-environmental behaviour and not resorting to scare tactics that highlight the punitive measures against liable offenders

'I feel the exercise would be more effective if people are reminded of their obligations and the benefits of the exercise and not the penalties.'
(FG0207)

Respondents, on further prompting, also mentioned that the perceived environmental policy culture of enacting policies as a reaction to environmental problems, rather than pro-actively seeking to eliminate them contributed to the failure of the ESP

'A culture of government's preference of punishment over encouragement for environmental behaviour has rendered ESP ineffective.'
(FG0505)

Box 7.2 Enforcing environmental laws in Lagos

HARD times now await defaulters of environmental sanitation regulations in Lagos State as the Ministry of the Environment has expressed readiness to enforce 'zero tolerance' for refuse and waste within the state

Offences for which the ministry warns that defaulters would not go unpunished include, indiscriminate refuse dump in unauthorised places like canal, road median, verges and setbacks, vegetal nuisance and over grown weeds, open defecation and urination, air, water and noise pollution and unauthorised erection of signals, banners and posters among others. Speaking during a briefing on the plans and programmes of the ministry at the State Secretariat, Alausa, Ikeja yesterday, the Commissioner, Mr. Muiz Banire, said the ministry is poised to break new grounds and positively impact on the lives of Lagosians. " It would not tolerate any form of environmental defaulter in the state anymore and whoever does contrary should be ready to face the penalty".

Lagos to enforce 'zero tolerance' on refuse (excerpt)

(Olumide, 2008)

Environmental Knowledge

The study found generally high knowledge about the consequences of anti-environmental actions on the environment among the respondents. This, however, did not seem to influence their environmental behaviour. A higher priority was given to practical issues such as the frequency and quality of PSP services, space to store the wastes before disposal (collection), available time to put waste bins out for collection on collection days where services were available and the cheapest collection services – be that PSP or cart pusher. This finding agrees with the study of Kempton et al (1995) that the possession of environmental knowledge does not necessarily lead to pro-environmental behaviour.

'I have never seen any PSP operator in my neighbourhood. I know it's wrong (because I know it ends up being dumped illegally; most of the illegal dumpsites are created by these people [cart pushers]), but I don't think I have an option.' (FG0501)

Altruism

Some respondents referred to 'higher' reasons why they did not litter. They mentioned that they engaged PSP services and did not litter because of their concern for the environment and the impact of anti-environmental behaviour.

'... Dirt leads to diseases and illness... It [clean environment] is for our collective benefit... Dirt harbours pathogens and vermin.' (FG0603)

While Archer (2001) notes that altruistic behaviour is a '...willingness to benefit another person when there is a choice to do otherwise', Barr (2004) concluded that waste pro-environmental management behaviour could not be classed as being altruistic. The findings from the focus group sessions show that altruism exists, at least according to Archer's (2001) definition, in some measure, and is among the motivating factors that influence waste management behaviour in some households in Lagos. However, the prevalence of illegal dumps and the continued practice of open burning of wastes by households (which impact on the lives of other people) suggests that altruism is not a major factor that influences waste management behaviour. While altruism, as an attitude, may be proven to exist as the results from the focus group sessions have shown, it would be difficult to validate the existence of true altruism, as a behaviour, in household waste management primarily because it is in the interest of the generator of the waste to dispose of it in a manner that has the least (direct) impact on them personally.

Apathy

Quite a few respondents attributed personal reasons for not participating in pro-environmental activities. They referred to a general lack of interest or sense of personal buy-in regarding the state of their immediate environment. When participation in the ESP was discussed, some respondents pointedly stated that they did not participate because they did not see the use and would rather spend time doing other activities.

'It [ESP] is time to stay in bed!' (FG0104)

'People aren't concerned about the environment because they may have other priorities. It's just inconvenient. People aren't thinking of their health or the effects the waste has on other things e.g. flooding.' (FG0101)

Also, some respondents mentioned that, besides the practical barriers of the lack of bins, they did not see reasons why they should not throw away litter on the streets. Littering, most participants felt, happens because people do not care enough about the consequences of their actions.

'I think people are just indifferent. They don't care about the effects [of littering]; they just want to get rid of waste.' (FG0104)

Personal control

Respondents mostly ascribed blame and responsibility for addressing environmental problems largely to the local and state government. The apparent delegation of blame and responsibility for environmental action as expressed in section 7.2.2 as well as a denial of direct involvement for causing the environmental problems is described by Kollmuss and Agyeman, (2002) as 'rational distancing' a situation where 'the person who rationalises is perfectly aware of that problems [caused by their environmental actions] but has stopped to feel any emotions about it'.

'Our aesthetics tolerance level is very high [we tolerate the worst of environmental behaviour]. We've lowered our expectations about how well our environment should look because we've become used to the filth around us.' (FG0103)

There was a general feeling of resignation among respondents about littering behaviour, suggesting that they do not feel their individual efforts will make a difference nor could the situation change. Newhouse (1991) refers to the perception an individual has about the power their actions have to bring about change as the 'locus of control'. Fahy (2006) refers to it as 'personal efficacy'.

'I do not believe it [ESP] is effective because all the dirt cleared gets back into the gutters so why bother.' (FG0204)

However, when asked to proffer suggestions to remedy this issue, many ideas were suggested, which included getting people to obey regulations

and understand the implication of anti-environmental behaviour through education.

Cultural controls

A few respondents mentioned that they did not engage in anti-environmental behaviour, particularly littering, because they had been brought up not to do so. While others also mentioned that their parents made them participate in the ESP and they have now got used to doing it monthly even though they no longer live with their parents.

Box 7.3 Health consequences of poor waste management practices

IT may look bizarre to visitors but for residents of Town Hall, Alhaji Raimi, Ifelodun, Mission Street, Layika Alafia, Ifelodun in Ajeromi Ifelodun, life goes on as usual on refuse-carpeted neighbourhood. They live atop refuse, walk on it and carry out other transactions typical of any other community on it. They may not have liked it but government's neglect of the area has forced them to live with filth.

The travail started about 18 years ago due to near absence of drainage, making the community to be swampy. But in their bid to solve the problem, after several appeals to the government without any response, the community decided to level the roads with refuse generated in the area.

Now, the very instrument has turned into a two-edged sword, by making residents to be susceptible to malaria and other diseases.

One of the residents, Mrs. Abimbola Lawal, received a telephone call in the early hours of Tuesday that is(sic) little niece was stooling frequently. When she got to the area, which the parents relocated recently, she needed nobody to tell her the cause of the sickness. She was greeted with refuse-carpeted environment. Paths leading to residents' home and other available spaces are filthy. Heaps of refuse compete with window levels of many homes. Where there were no refuse on the streets, a two-plank pathway atop pools of stagnant water comes to their rescue.

On getting to Town Hall Street where her niece lives her parents, she was shocked at what she saw. She asked: "Is this not part of Lagos State? Tell me why the residents should not be sick. This is unbelievable in a mega-city like Lagos."

Another side of the mega-city (excerpt)

(Ibimere, 2010)

'No. I do not litter because my parents taught me not to.' (FG0302)

'My upbringing encouraged pro-environmental behaviour.' (FG0403)

'The older generation were more frugal, [they] bought things for long term use and hence were more inclined to re-use.' (FG0104)

The cultural 'conditioning' of individuals towards anti-environmental habits was cited as one of the main reasons for littering. Kollmuss and Agyeman (2002) affirm that cultural norms play a vital role in environmental behaviour.

Environmental values, which could be argued to develop and evolve through the cultural conditioning process, have been shown to influence pro-environmental behaviour among households in this study. From the three quotes above, it is evident that childhood experiences, learning from parents while growing up and general environmental values held by the family strongly influence environmental behaviour. This conditioning could either be inclined toward pro or anti-environmental behaviour as shown in the quotes below.

This study revealed that conditioning of populations may play a role in lowering perceptions of what is 'right' or pro-environmental. This notion was raised during the discussions and respondents mentioned that there has been a marked 'increase' in tolerance levels for what is acceptable environmental behaviour.

'People don't see anything bad in anti-environmental behaviour [littering] because they haven't seen [been introduced to] anything different [alternative behavioural lifestyles].' (FG0506)

Domestic priorities

The decision making hierarchy of domestic priorities within households was mentioned by some respondents as having influence on their waste disposal choices. They felt there were instances and situations where other household activities and needs were of a higher priority than ensuring using PSP services or participating in the ESP. Stern et al (1993) attribute the perception of individual wellbeing as well as that of family members as the most important priority within households. Kollmuss and Agyeman (2002) in agreeing with Stern's model

propose that when pro-environmental behaviours are in alignment with the [highest ranked] priorities, the more likely there will be a higher motivation for engaging in pro-environmental behaviour.

Various priorities that influence participation in the PSP and ESP were highlighted by householders. The major issues mentioned and discussed at length by respondents were those relating to the earlier mentioned 'external factors' of time, space, availability and access to facilities and most especially cost. The survey revealed irregularities in the cost of PSP services within and between different sampled areas. There was an instance where a resident mentioned that she paid for PSP services but complained about the frequency of collection while a second resident in the same block of flats said she had never paid for the services, neither was she aware the PSP service existed for her building.

'The PSP come to empty bins outside... Their service is infrequent... I think if we pay, they'll [PSP] come regularly. If not I'll use the cart pushers.' (FG0505)

'I have not been paying, I really am not sure why, but perhaps the Government is paying.' (FG0503)

The first quote above corroborates the finding of Kollmuss and Agyeman that if pro-environmental behaviour, which in this case is using PSP services, is superseded by other priorities (the need to get rid of waste) of households, then the behaviour is less likely to be taken.

7.5 Implications of Baseline Evidence

This Chapter has highlighted the factors that combine to influence household behaviour in respect to waste disposal options, street littering and participation in the ESP. Most householders use the services of informal sector waste operators because they do not receive regular services from PSP operators.

Inclusivity, along with financial sustainability as well as the development of sound policies and institutions has been recognised as one of the three key delivery strategies of implementing a successful ISWM system (Scheinberg et al, 2010). This study has highlighted the impact the absence of householder inclusivity has

had on the success of household waste policies and interventions, where the neglect of householders from input in policy formulation has either failed to bridge existing barriers to householders' participation in waste management activities or has created new ones through inappropriate interventions and has thus compromised the success of waste management policies in Lagos state.

CHAPTER 8. INTEGRATING EVIDENCE INTO WASTE POLICY IN LAGOS

8.1 Introduction

The previous three chapters have identified and analysed the perceptions, thoughts and actions of householders as they pertain to existing waste management systems in Lagos. This chapter provides a framework for utilising the acquired evidence for verifying the efficacy of existing policies and identifying alternatives where appropriate.

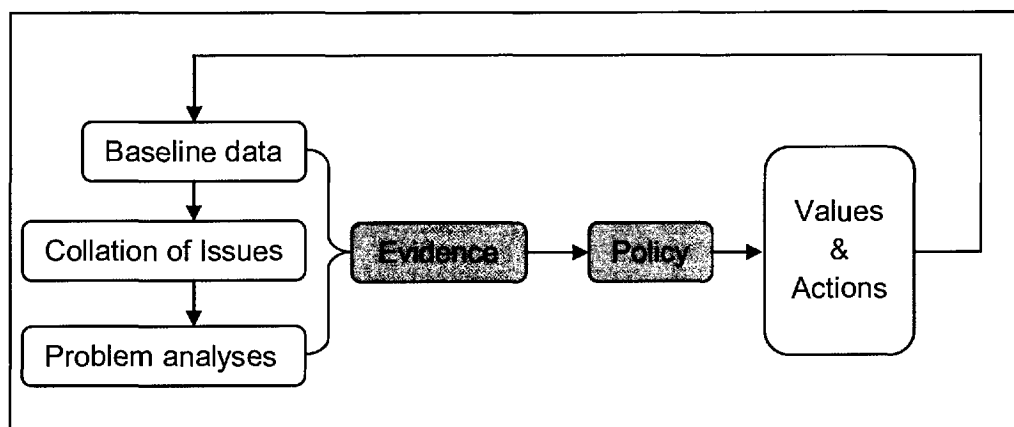


Figure 8.1 Flowchart showing the use of acquired evidence to strengthen policy

The first step in presenting the evidence for possible integration into an existing or future policy framework involves an appraisal of the current waste management scenario based on observation and acquired information. The next step is to examine the existing / potential impact of the current policy strategy as well as any benefits or drawbacks it may have. Finally, policy suggestions are made based on derived evidence to align current and future strategies with the ideals of the ISWM model.

To aid the explanation of the current waste management system in Lagos, a framework has been developed to illustrate the flow of waste and resources (see Figure 8.2). Waste leaves households through three main sources: Directly through householders and collection by either the informal sector workers or the PSP operators. The waste either gets taken to landfill (mostly by the PSP), legal dumps (by all three) or is dumped illegally (mostly by householders and informal sector workers). However, it is probable that the PSP operators are also involved

in the illegal dumping of wastes (see Picture 8.5). All other waste that does not leave the households is either buried (not a common practice) or burnt in heaps within their premises. Resource flows recovered from household waste may be considered at 3 levels, based on the quality of the reusable and recyclable materials.

Level 1 is sourced directly from households, mostly by the informal sector workers. This level comprises, clean, higher quality, separated materials as obtained by the itinerant waste buyers (IWBs).

Level 2 comprises of recovered materials sourced from: street litter by the informal sector waste pickers, the legal and illegal open dumps, as well as from household wastes collected by the PSP operators and cart pushers. The materials sourced through this level of extraction are typically of a lower quality than the level 1 material and usually require secondary sorting and cleaning to improve their value.

Level 3 comprises of secondary scavenging, mostly from permanent open dumps or landfill sites. The materials recovered from this level of resource extraction are usually lower in quality and purity than the previous two levels mostly because the higher quality materials may have been extracted before the waste arrives at the permanent dumps or landfills.

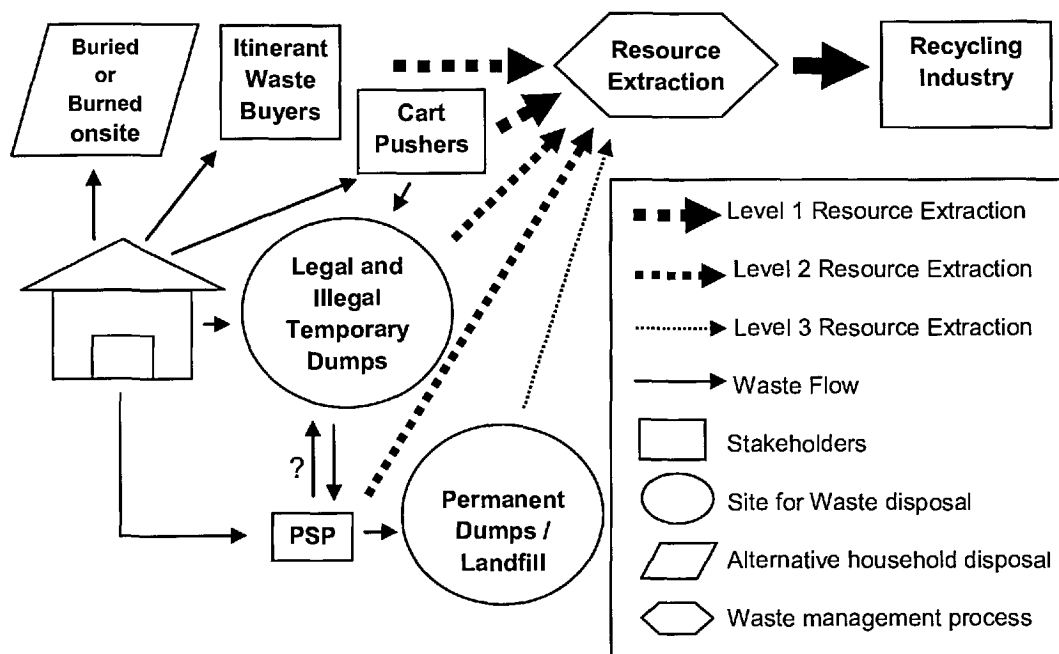


Figure 8.2 Current waste and resource flow in Lagos

The informal sector workers (see Section 2.3.9), particularly the cart pushers, operate in areas where PSP services are poor or non-existent (see Box 8.1). They collect waste from households and deposit them either in legal, temporary dumpsites or illegally in waterways, illegal dumps and on empty plots on land.

8.1.1 Implication of the current policy interventions

The most significant change in the flow of waste and resources framework as a result of the full implementation of the ESP and PSP programmes will be the cessation of informal sector waste activities in Lagos (see Figure 8.3). This is discussed below under potential impacts on households and the informal sector.

On Households

The evidence derived from this research have been used to examine the ESP and PSP programmes - aimed at addressing illegal dumping of wastes and improving the household waste collection systems. Tables 8.1 and 8.2 present the analysis of the ESP and PSP programmes in terms of their aims, the current barriers to their success and the consequences and concomitant actions by householders on the success of the policies.

In the absence of the informal sector, which already performs about 39% of the waste collection service in Lagos, and with the current low level of service by the PSP in Lagos, there will be a significant increase in household wastes being disposed of through alternative means (see Figure 8.3). These alternative means, as described in Chapter 5 include: open burning, burying in residence, illegal dumping and potentially, the illegal operation of informal sector workers - particularly cart pushers - in the absence of adequate service provision by the PSP.

Box 8.1 Householders' complaints about the quality of PSP services in Lagos

The inadequate services rendered by the refuse disposal agencies should also be attributed to non co-operation by some Lagosians, according to the operators.

"People are not paying. That is another problem. Some people do not pay for up to six months. You don't even get 20-30 per cent compliance from them. The problem is both operators and waste generators. All of us should take responsibility - operators, generators, and even the government. Government should enforce people to pay," said Mrs. Don-Adinuba.

For Bisi Ajiboye, a resident of Yaba, the overzealousness of the staff of the refuse disposal agencies is a reason some of them are not co-operating.

"You should be here when they come and see how they treat us. The other day, I fell and sprained my ankle while pursuing the truck just to throw in my refuse, all because they refuse to wait. Sometimes, I feel we are better off with the cart pushers," said Mr. Ajiboye.

Taking out the trash (excerpt)

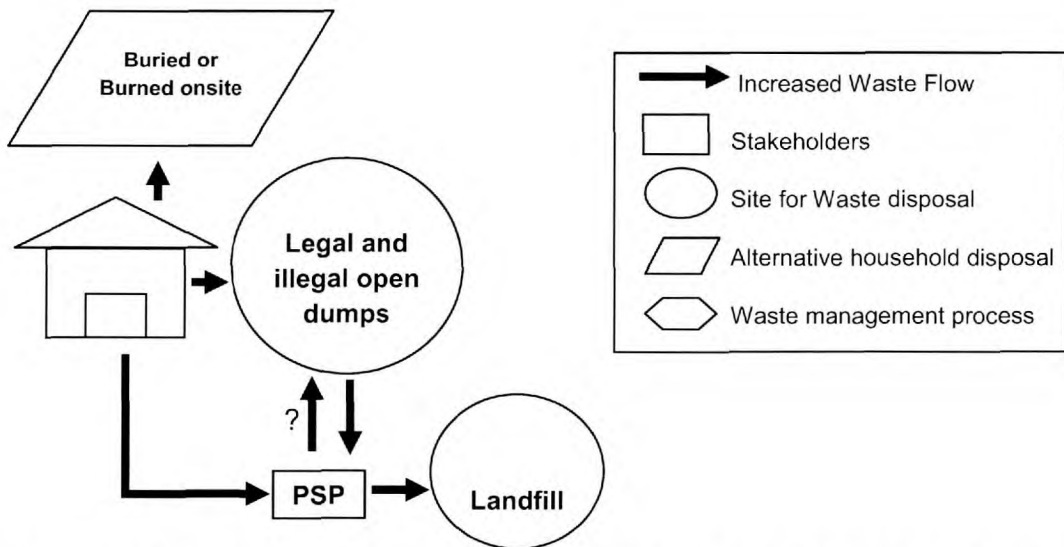


Figure 8.3 Potential waste and resource flow in Lagos if current policies are fully implemented

Table 8.1 Barriers of PSP Programme on Households and Resulting Behaviour

| | |
|---|---|
| PSP Aim: | Provide an efficient household waste collection system in Lagos |
| Target Group: | Households in Lagos |
| Barriers: | <p>Lack of space to store waste in residence before collection</p> <p>Inconvenient scheduling of waste collection times</p> <p>No kerbside space to place bins on days of collection</p> <p>Irregular PSP service</p> <p>Unclear billing system</p> <p>Unclear information about the obligations to use PSP</p> |
| Consequences: | <p>Threat to wellbeing from accumulated wastes in residence</p> <p>Apathy and lack of trust towards PSP programme</p> <p>Confusion about billing system</p> <p>Dissatisfaction with PSP service</p> <p>Inadvertent (or deliberate) contravention of obligations</p> |
| Resulting Actions by Householders: | <p>More frequent use of informal sector waste operators (Cart Pushers) as alternative waste collectors</p> <p>Increased incidents of open burning of waste / Burying of waste within compounds</p> <p>Increased incidents of dumping of waste in streets, storm drains</p> <p>Non payment / unwillingness to pay for PSP services</p> |

Table 8.2 Barriers of ESP Programme on Households and Resulting Behaviour

| | |
|---|---|
| ESP Aim: | Eliminate the accumulation of illegally dumped wastes in Lagos |
| Target Group: | Households in Lagos |
| Barriers: | <p>Insufficient information about householders' obligations</p> <p>Heavy reliance on punitive action to achieve compliance</p> <p>Insufficient support (LAWMA and PSP) to clear piles of waste immediately after the programme ends</p> <p>Inconvenience caused by the restriction of movement during the programme</p> |
| Consequences: | <p>Apathy and lack of trust about the effectiveness of the ESP</p> <p>Inadvertent (or deliberate) contravention of obligations</p> <p>Non willingness to participate in the programme</p> |
| Resulting Actions by Householders: | Non / Low level of participation in the ESP |

On the Informal Sector

Most significant is the absence of 'level 1' resource extraction of clean, separated materials. As highlighted in Section 8.1, resource extraction at this level is carried out primarily by the IWBs, supported by the cart pushers. The cessation of informal sector involvement in household waste management immediately translates into the loss of this level of resource extraction. This also bears significant impact on level 2 resource extractions, as street waste pickers and cart pushers will no longer contribute in resource extraction at this level, leaving the task entirely in the hands of the PSP collection operators, whose contribution to resource extraction, based on field observations, may be described as tepid at best.

A lot may be inferred from Schedules 7, 19 (1) and 24 of the Lagos State Environmental Sanitation Law (see Appendix C-1) which state respectively that:

7. *No persons shall dispose of domestic refuse or waste except through a Private Sector Participation Operator*
- 19 (1). *As from the commencement of this Law, no person shall establish, carry on or run a private refuse collection outfit except such outfit is registered with the appropriate Local Government and licensed by the Ministry and;*
24. *Any private refuse collection operator who fails to register with the Local Government and to obtain a license from the Ministry is guilty of an offence and shall be liable to fine or imprisonment as specified under the Schedules to this Law.*

The focus of the Environmental Sanitation Programme appears to be the elimination of unlicensed private waste operations while promoting formal collection systems through the PSP programme. The implication of enforcing this, means that informal sector waste operators comprising of: cart pushers, itinerant waste buyers (in cases where they do not pay householders for the collected materials), street waste pickers and dumpsite scavengers are all excluded from dealing with the waste stream in Lagos. This will significantly increase the volume of wastes already being disposed through non conventional means in areas underserved by the PSP. The legislation is unclear regarding the activities of dumpsite and landfill scavengers as it does not mention resource extraction activities from street litter and at dumpsites.

The resource value of discarded materials, which make up household waste, is a major driver for informal sector activity in the Lagos waste management system. Wilson (2007) identifies the resource value of waste as a significant driver for the development of waste management systems in low and middle income countries, where the informal sector worker is able to make a living by recovering saleable materials from waste. The continued existence of informal sector activity within the Lagos waste management system suggests that not only is there a steady demand for their services by householders, which are paid for, but also, they fill critical gaps in waste service provision by the PSP operators. The study revealed that there are households that are either not serviced or are underserved by the PSP which depend on the informal sector to provide waste collection services.

The abolition of informal sector operations in the waste management sector (based on the Lagos State Environmental Sanitation Law) before scaling up the service capacity of the PSP will create uneven gaps in service provision across the State. There is a potential risk that the gaps in service provision as a result of the cessation of informal sector activity in the waste management system will create undue burdens on the PSP capacity and may well lead to significant increases in illegal dumping incidents if the PSP services fail to meet household waste collection service demands.

There are no definitive data on the scale of informal sector waste operations in Lagos in terms of number of operators, total volume of waste transferred from households or volume of recyclable material diverted from the waste stream. However, recent studies in other developing country cities in the Philippines, India and Egypt estimate recycling rates (minus non-recyclable waste collected) of about 22.8, 24.3 and 74.3%, respectively, out of the entire volume of wastes generated, as the independent contributions of the informal sector to urban recycling (Wilson et al, 2009).

The waste reuse and recycling systems in Lagos benefit from the activities of the informal sector workers, as they contribute a significant amount of resource input for both systems. The elimination of the informal sector from the current waste management system in Lagos, will deplete the recycling output from the State and also significantly reduce the volume of clean, segregated materials being diverted from the waste stream through the IWBs, implying the loss of levels (1) and (3) resource materials (see Figure 8.5), with significant reductions in level (2) materials as well. Also, since cart pushers, street waste pickers and dumpsite scavengers make up the bulk of the materials recovery system from waste streams in Lagos, it stands to reason that overall recycling rates of materials from the household waste stream will decline significantly and may approach the single digit percentage figures that were obtainable in most developed countries during the early 1980s (Wilson et al, 2009).

The informal sector waste operations, especially those of the IWBs, street pickers, and scavengers are driven primarily by the resource value of the materials they collect and are solely funded by private enterprise. Their contribution to the waste management system in terms of diverting reusable and recyclable materials from the waste stream, which in turn reduces the volume

(and cost) of waste sent to landfill by the PSP, is in effect subsidising the overall cost (to the Lagos State government) of household waste management. Recent studies in other developing country cities have also shown that the activities of the informal sector contribute to subsidising municipal waste management costs in ways similar to that described in Lagos (Waste and Skat, 2007).

Furthermore, the informal sector waste operation, which covers most of the State, is a private employer of labour that, even though not yet quantified, can be guesstimated to have an operational staff strength that may range from the high tens of thousands to the low to mid hundreds of thousands (BBC, 2010). The direct impact of abolishing their operations may translate into the loss of jobs for the informal sector workers and a loss of income for their families.

8.2 Repositioning the waste management issue

It would appear, in summary, that the current regime of waste management policies in Lagos are focused on eliminating the practice of illegal dumping and stepping up household collection. Illegal dumping has been rightly identified by the government as a significant problem. However, the move to abolish informal sector waste operations as the solution to this requires further thought. If the priorities of waste policy were repositioned, from one targeted at increasing volume of wastes collected and landfilled to priorities targeted at increasing resource extraction, a different picture appears.

If maximum resource extraction – a goal of sustainability in waste management – one of the 3 key physical elements of waste management policy, was to form one of the core objectives of waste management policy, as it does in Western Europe and other developed countries, then the informal sector becomes a critical stakeholder rather than a bothersome, unwanted inconvenience in the waste management system as their informal structures, without public funding, already form the major resource extraction mechanisms that exist in Lagos presently. They are involved in all 3 identified resource extraction levels and are the only stakeholder involved in the extraction of level 1, source separated materials.

In light of the above reasons, it would seem that abolishing the operations of the informal sector as a means of controlling illegal dumping in Lagos would be

counterproductive because of the current and potential benefits they (could) provide.

Rather than imposing a blanket ban on informal sector activities, it would be more pragmatic for the government to address the barriers informal sector workers face to 'legal' disposal of wastes which would aim to capitalise on their potential value to the waste management system (as agents of primary resource extraction from source) and eliminate the risks they pose to the waste management system.

8.3 Evolving evidence based policy strategies

The key household waste issues, with suggestions, are presented in this section, based on the evidence derived from this study. The purpose of this is to highlight how acquired evidence may be used to modify an existing waste management system to improve integration of stakeholders and practices while ensuring overall system sustainability.

Up until the 1990s, most discussions around waste management and waste management systems revolved largely around technology (Scheinberg et al, 2010). While technology is important, it is only a subset of components that make up a waste management system and therefore cannot be relied on as the panacea for all waste management issues.

The Integrated Sustainable Waste Management (ISWM) model presents a framework for viewing waste management in terms of how all the stakeholders, waste system elements as well as waste management aspects interact (see Figure 1.4). A systems based framework enables planners of waste management systems to observe the interactions of ISWM components with a view of improving overall efficiency and sustainability.

Pertinent questions regarding the recognition of all stakeholders, ownership of the waste management system and how each stakeholder may be integrated into the existing waste management framework in Lagos need to be addressed to successfully implement an integrated waste management framework.

8.3.1 Acknowledging waste management stakeholders

Ownership in this context is framed along the lines of responsibility for the planning, development, operation, funding, upgrading and use of the waste

management system. The short answer to 'who owns the system?' is the waste management system belongs to all the stakeholders. However, based on the systems approach of the ISWM, each stakeholder has roles that are specific to them and others that are shared with other stakeholders. Ownership, therefore, in this systems context, is the measure to which each stakeholder is made aware of their roles and is allowed to contribute to the efficiency of the waste management system and be able to take responsibility for ensuring its sustainability.

8.3.2 Promoting stakeholder engagement

The principle of inclusivity, which seeks to involve all stakeholders in the design, development, deployment and review stages of waste management systems, forms one of the three key governance features of the ISWM framework (inclusivity, financial sustainability, sound institutions and proactive policies) and is a key aspect of developing system ownership among stakeholders.

Inclusivity, which could be said to be targeted at two main groups, service users and service providers, may be divided into four categories: information, service user, service provider and institutional support (Scheinberg et al, 2010).

Information inclusivity is concerned with acquiring local knowledge and understanding the dynamics of the waste management system in a particular area before an intervention is carried out. Previous waste management interventions in Lagos have typically imported foreign practices, systems and technologies to improve the waste management system without initially considering the realities of existing systems with the view of building on what already works. An example of this is the installation of German built waste incinerators in Lagos in the late 1970s for household wastes which have low calorific value and high moisture content that is not suitable for the technology (see Chapter 2). Prior to any discussion or planning of waste management interventions, it is necessary to acquire evidence based local knowledge of the current system as well as baseline information on the attitudes, behaviours and interrelationships between service users and service providers with the view of introducing changes that build on existing strengths and mitigate weaknesses that will improve the performance and sustainability of the system.

As any changes to existing or future systems will have direct impacts on the intended targets (service users) in terms of the need for attitude and behavioural change, it is important to include the users in the decision making process, right from inception to deployment. The provision of platforms where service users and waste management planners may come together to discuss and jointly develop the waste management system in an open, fair manner, free of preconceptions or prejudice and where all opinions are taken into account before decisions are finalised would help reduce issues of apathy, non-willingness to pay and lack of trust towards waste service providers. An example of the potential risks of not involving users in the decision making process in Lagos may be found with the PSP trial in 2007 (see Box 7.3). There are successful examples of participatory platforms where service users actively engage in dialogue with waste planners in Quezon City (The Philippines), Bamako (Mali), Rotterdam (The Netherlands), Adelaide (Australia) and Belo Horizonte (Brazil). Brazil has been recognised as a global leader in good practices that promote inclusivity for both service users and providers (Scheinberg et al, 2010).

Inclusivity is equally important in the siting and planning of waste management facilities. The Strategic Planning Guide for Municipal Solid Waste Management (SPG), which was published by the World Bank in 2001 provides guidance for this purpose (Wilson et al, 2001).

8.3.3 Improving the collection system

The key barriers to householders participating in the PSP system were highlighted in Chapter 7 to include:

- i. Irregular collection times and days
- ii. Infrequent collection
- iii. A lack of space to store waste before collection and;
- iv. Access to information about the PSP services

Two points may be drawn from the above listed issues. First, these issues are all 'external' according to the classification framework used and also, the constraints appear to be mostly practical in nature and therefore, their solutions mostly lie in practical interventions.

A redesign of the PSP collection system to incorporate collection times that encourages maximum participation as well as the provision of facilities that deter the use of alternative disposal methods may solve the problem of the dumping and open burning of household wastes. This, of course, is based on the assumption that all households will be provided equal access to PSP services.

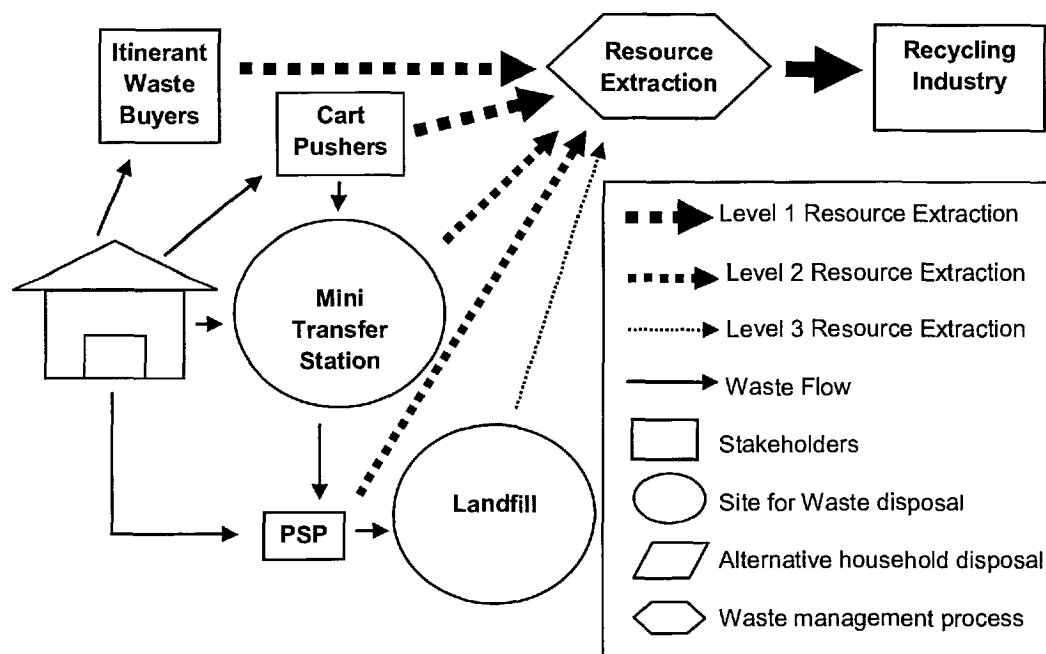


Figure 8.4 Proposed waste and resources management flow

An alternative arrangement could be the installation of large communal bins (see Figure 8.4), which would serve as mini transfer stations, in neighbourhoods where in-house storage of waste is a constraint (for example, low income areas with high population densities like Ajegunle or Mushin or in high density slums like Makoko, where most houses are built on stilts or directly on artificial islands – made of compacted domestic waste - within the Lagos lagoon).

This approach may address some of the constraints faced by PSP operators which include: access into neighbourhoods with narrow or impassable roads, householders not being home at the time of waste collection, as well as the time constraints the PSP vehicles go through from making round trips between waste collection points and the landfill sites, which places a huge financial burden on operation costs and limits the PSP budget for maintenance. It may also eliminate the burdens associated with storing wastes in-house and also avoid the conflicts of household collection scheduling. The informal sector may be integrated into

this arrangement as the primary waste collectors, and have their services scaled up in areas where the PSP service is not fully established. This arrangement allows for increased collection rates of household waste while also stepping up the recovery rates of saleable resources from the waste stream.

For this alternative to succeed, the PSP collection vehicles must routinely and frequently empty and clean the bins and their surrounding areas to improve the aesthetics of the area and encourage household participation. The 'mini-transfer stations' suggested here may be used as a short to medium term solution for waste collection until the efficiencies of the PSP collection operations increase and, also, until the transportation infrastructure in the State is upgraded to improve access of PSP vehicles to all areas. In the long term, based on the infrastructure available, a full primary, door to door waste collection service can be created with both PSP and cart pushers working side by side to eliminate householders' direct disposal of wastes to the mini transfer stations which may then, in turn, be converted into other waste management uses, for example, as a storage and sorting centre for recyclable materials.

Secondly, there is a need for the Government to review the billing mechanism of the PSP system, as waste collection cannot be compared with water or electricity supply where failure to make payments for services could easily be enforced by withdrawing access to these services. The withdrawal of waste services from service fee defaulters may increase incidents of illegal dumping. Alternatives to direct charges should be sought or whole subsidies made in cases where households cannot afford to pay for services, as findings from this research suggest that out of the households willing to pay for waste collection, there are some that may not be able to afford the fees charged for the service.

A pay-as-you-throw (PAYT) scheme, suggested by some householders during the survey, may inadvertently encourage waste reduction as householders will seek to cut down on the volume of waste disposed of in order to reduce waste service charges. Conversely, it may also encourage on-site burying and open burning of waste by householders unable to afford disposal costs. However, this system may be difficult to administer and logistically tedious to enforce in a developing country city like Lagos due in no small part to the institutional factors mentioned earlier in section 7.4.1. A flat direct service charge provides a more practical approach to collecting fees for the PSP service, given the mitigating

circumstances. The institutional support for the PSP system needs to address the issue of payment mechanisms for the services. This may prove to be the main challenge in making the entire programme PSP financially sustainable. The current system where the Government allocates concession areas to PSP operators and pays them based on the weight of waste taken to landfill is riddled with loopholes.

First, with a fixed price paid to all PSP operators based on weight of waste taken to landfill, there is an undue advantage given to concessionaires operating in areas closer to landfill sites as the PSP vehicles will have shorter round trips to make between collection point and the landfill site, thereby depositing more waste at the landfill per day and by implication, generate more profit than operators of concessions further away from landfill sites. Second, there is no clear way of verifying that the waste being taken to landfill was collected from the concession areas. Because of the first reason given, operators of concessions further away from the landfill may attempt to collect wastes from areas closer to the landfill sites just to make their profit at the expense of their underserved concession areas. As suggested previously, the use of mini waste transfer stations reduces collection time and consequently, increases the frequency of trips that PSP operators can make daily between point of waste collection and the landfill site and, possibly, improve the quality of service delivery.

8.3.4 The informal sector – clogs, or cogs, in the wheel of development?

Much has been written about the operation of the cart pushers (Wilson et al, 2009, Scheinberg et al, 2006 and Wilson et al, 2006) and their activities remain a divisive topic among some waste management stakeholders in Lagos (see Boxes 7.2 and 8.2). There is, however, no denying that even from a purely entrepreneurial point of view, based on evidence from this study, the cart pushers have earned the patronage of many households in Lagos and the services they provide are comparatively more reliable than those of the PSP in areas where they still operate. The challenge for policy makers, as regards the informal sector, will perhaps be in developing processes that will aim to integrate both formal and informal waste management activities where the system will benefit from the

strengths each stakeholder has acquired while limiting the impact their shortcomings may have.

Q: The cart pushers have been described as a clog in the wheel of the PSP operators. Do you think government can phase out this group of "operator" because of their ability to go to the interior of districts and communities to cart away peoples waste?

A: You're right, the cart pushers have been a source of our headaches most times because they were fond of collecting money after picking wastes from different homes only to go and dump the waste in the middle of the road, or at times in a drainage or along the major road in the city. They cannot afford to go to the recognized dumpsites in the city. So, if they cannot find this illegal dumpsite near where they operate, they dump the waste which they have been paid for to go and dump at dumpsites indiscriminately on the road. But, I think the franchising system introduced by the government will take care of the cart-pushers. Similarly, the PSP operators and the Monitoring Group set up by LAWMA have been empowered to seize the pusher's cart anywhere we met them on the road. I am very sure they will be chase away from the highbrow areas of the city.

Cart Pushers, Our Source of Headache – Lagos Waste Management Operator

(Akinola et al, 2008)

Box 8.2 PSP operator's perception of informal sector workers

There is, perhaps, a need to rethink what exactly constitutes a PSP system, as it seems it has been branded as being synonymous with the use of modern collection systems and equipment (see Box 8.3 and Picture 8.1).

Governor Fashola also used the opportunity to urge residents to desist from patronising the already banned cart pushers, saying that with the unveiling of TLS (Waste Transfer Loading station), the activities of these illegal waste collectors were gradually coming to an end. He said that the activities of cart pushers had always compounded the process of refuse collection as they collect waste from one area and dump same in illegal spots. ..."This facility has no place for cart pushers. It was designed for the type of waste collection trucks used by PSP operators that operate in modern cities.

Waste Management – Fashola Commissions 1,000 Metric Tonnes capacity TLS (excerpt)

(Akoni, 2009)

Box 8.3 Lagos State Government's perception of informal sector workers



Picture 8.1 LAWMA branded trucks awaiting export to Nigeria.

Source: Skyscrapercity.com, accessed 01.12.09

The concept of a Private Public Partnership (PPP) in managing waste as well as the potential pitfalls that exist in the process of designing a successful system have been explained and reviewed in literature (Coad, 2005; Cointreau-Levine, 1994). Due to the gradual decline in waste collection services in Lagos, leading to the proliferation of cart pusher services during the 1980s and 1990s, there have been cultural, technological and management gaps in operational waste management procedures for the private sector. Because of these gaps, unrealistic expectations should not be placed on the current PSP system. Rather, it should be assumed that the dearth in operational and management experience of waste operators may contribute to low efficiency levels of service in the first few years of the programme. Efficiency levels should be expected to rise as years of experience and competencies within the system increase over time.

In addition, since the cart pushers (and other private informal sector waste operators) have filled the void left by the PSP over last three decades, there is a lot to gain by capitalising on their local knowledge, customer patronage and operational experience by integrating them into the current PSP system. The informal sector workers need not be perceived as a threat to the waste management system in Lagos, rather, they could be viewed as adding value to a waste management system that is still developing.

The informal sector waste operators could instead be licensed by the Government to provide a primary waste collection service similar to the International Labour Organisation (ILO) backed (PPP) programme set up in Dar es Salaam in 1997 (Ishengoma in Scheinberg et al, 2010) where private sector workers, otherwise excluded from the business of waste management service provision due to low investment capital were allowed to bid for waste service franchises. They may also be deployed to transport waste from households to the communal mini-transfer stations suggested in this section, in situations where the PSP vehicles cannot get access to certain areas or neighbourhoods or in areas where affordability for direct waste charges for PSP services are an issue. The informal sector operations can be organised in ways that do not impede the PSP, but maintain a high rate of resource recovery which reduces the total volume - and consequently, cost - of waste collected and disposed.

The Government may choose to proceed with these methods with a view of gradually phasing out the informal cart pusher operations, while integrating them into a waste management system that is built based on local needs and not conformed to unwieldy conventional practices that do not suit the local situation in Lagos. The success of the waste management system in Lagos will be judged by how it addresses the operations of informal sector waste operators. Recent evidence from other developing country cities shows that it is possible to integrate the informal sector into a conventional waste management system that incorporates social, environmental and economic benefits. Results from Quezon City in the Philippines, and New Delhi in India prove that innovative ideas are capable of aligning informal sector activities with the overall aims of a city government's environmental policies (Scheinberg et al, 2010).

8.3.5 Littering

The 4 E's of influencing behaviour change through Enabling, Engaging and Encouraging people and communities towards sustainable lifestyles represent one of the major approaches being utilised by policy makers in Europe in influencing behavioural change. It also includes the need for Government, which includes all public authorities, to lead by example (DEFRA, 2005). Deploying this strategy against littering behaviour in Lagos may be the first logical step in bringing about long term behavioural change.

It may seem basic to suggest the provision of bins as the panacea to littering in Lagos. However, as simple as this solution may appear, the fact that there are not many public bins on the streets suggests that the lack of bins may be a significant factor in influencing littering behaviour. The intent not to litter, as strong as it may be in any individual, will be compromised in the face of technical barriers such as the lack of bins to deposit the waste. On the other hand, the presence of bins does not necessarily influence behavioural intent. If an individual, for personal, social, cultural or practical reasons, chooses not to use public waste bins, then the presence of bins will have little or no influence in determining their use of it. For an anti-litter public campaign to succeed, it must target the factors that potentially influence both the behaviour as well as behavioural intent. The impact on littering behaviour that the provision, and regular emptying, of bins in public spaces will have cannot be estimated until such a programme is piloted over a trial period.

Do not be conformed to this world (this age), [fashioned after and adapted to its external, superficial customs], but be transformed (changed) by the [entire] renewal of your mind [by its new ideals and its new attitude]

Romans 12:2 Amplified Bible

The quote above from the *Amplified Bible* suggests that the concept and understanding of behaviour change and its influences is not new and that behaviour change is possible. However to achieve this, a focused behavioural change programme, backed by adequate service provision, an encouraging environment that supports change as well as the endorsements of 'change champions' who may be celebrities or respected role models in the society who would demonstrate how the 'new' behaviour, should be practiced. This proposal is best highlighted using DEFRA's 4 E framework (Figure 8.5)



Picture 8.2 Cart Pusher walking past LAWMA staff (wearing orange overalls) in Lagos

Source: Araba, 2009

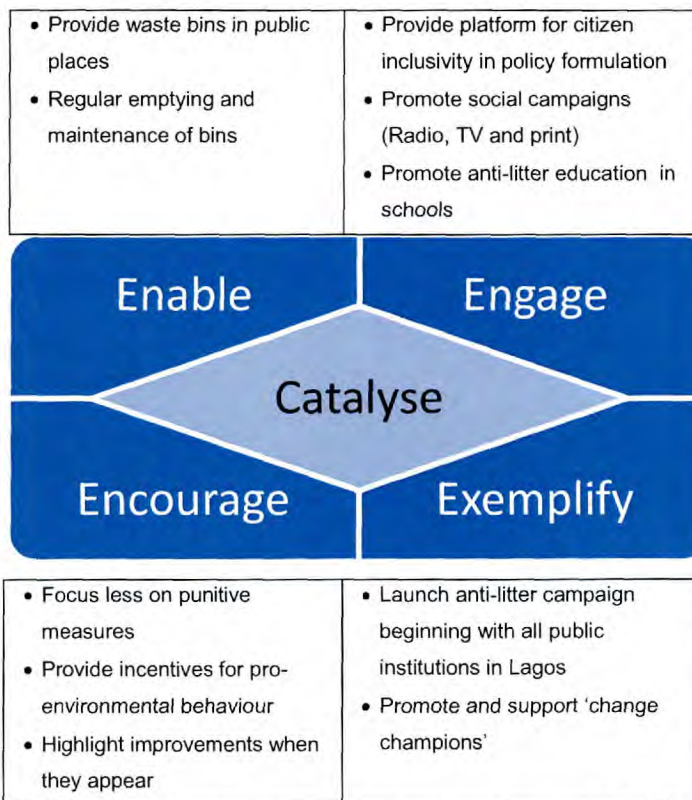


Figure 8.5 Influencing littering behaviour in Lagos using the 4 E's

8.3.6 Environmental campaigns

The main drawbacks of both the current format of the Environmental Sanitation Programme (ESP) and the Kick Against Indiscipline (KAI) campaign are that they

aim to influence behaviour without initially considering the factors that influence behavioural intent. This approach may prove successful in the short term, as whatever coercive instrument used may be initially effective, as was the case with the early ESP and WAI campaigns where the deterrent against non-compliance and anti-environmental behaviour was the threat of physical punishment and detention. Ultimately, this system is unsustainable because, once the coercive instrument - in this case, physical punishment - is removed; the initial influences resurface to affect behavioural intent.

It [WAI] was effective because it had punitive measures (FG0105)

The KAI campaign, based on the earlier War Against Indiscipline (WAI) campaign (See Chapter 2) not only lacks potency based on the points raised above, but it is also based on what Burgess et al (1998) describe as the information deficit model of public understanding and action (Burgess et al., 1998). The basic premise of this model is that an increase in knowledge about a subject (or object) increases the rate of behavioural change towards it. An example of the information deficit model of the KAI campaign is shown in Picture 8.3.



Picture 8.3 KAI Billboard in Lagos highlighting the information deficit model

Source: Rowe, 2008

Note that the message on the billboard in Picture 8.3 presupposes that the attainment of formal education should qualify an individual to possess pro-

environmental behaviour, an assumption which mirrors the information deficit model and does not recognise that there may be other factors which may influence behavioural intent. This is comparable to the 'Are You Doing Your Bit?' campaign of the late 1990s in the UK on promoting sustainable development awareness by the UK Government (Owens, 2000).

The KAI campaign mirrors the now disproved models of environmental behaviour which assumed that pro-environmental behaviour was based on a linear progression of environmental knowledge, which led to environmental concern in the form of attitudes, which in turn caused pro-environmental behaviour (Kollmuss and Agyeman, 2002). The adoption of this information deficit model, which presupposes that increased knowledge about an issue will increase the chances of pro-environmental behaviour, has, in some part, contributed to the failure of the KAI campaign.



Picture 8.4 LAWMA sign warning against illegal dumping

Source: Araba, 2008

The presence of heaps of waste being dumped illegally despite official warnings (see Picture 8.4) suggests that the threat of prosecution is not a strong enough deterrent in the face of other factors which influence behaviour (perhaps practical constraints of lack of waste collection services?). Moreover, it was found during the course of this research that the cart pushers were not the only group of waste operators who dumped wastes illegally. There was an instance, during the 2008

qualitative survey, where a LAWMA street sweeper was found to be dumping street sweepings illegally (see Picture 8.5). This observation is critical as it suggests that the cart pushers are not solely responsible for the incidents of illegal dumping of wastes.

McKenzie-Mohr (2000) notes that sound, community-based social marketing strategies, begin with identifying the barriers to pro-environmental behaviour. Without detailed knowledge of barriers, it is highly unlikely that an effective strategy can be developed (McKenzie-Mohr, 2000).



Picture 8.5 LAWMA street sweeper emptying waste in illegal dump.

Source: Araba, 2008

8.4 Evolving a needs based, locally driven system

An Integrated Sustainable Waste Management (ISWM) approach to addressing the waste management needs as well as formulating waste management policy has been shown, with evidence, to improve waste management systems in cities across the world (Scheinberg et al, 2010). This may be achieved through: the inclusion of all key stakeholders in the decision making process, reduction of generated waste and disposal costs by the informal sector, through recycling, local acceptance of waste strategies, encouragement for householder's

willingness to pay for waste services, incorporation of local knowledge and practices, provision of livelihood to small and medium scale entrepreneurs – both formal and informal as well as moving waste management strategies further up the waste hierarchy.

This research focused primarily on the relationships between waste policies in Lagos, their sustainability and impact on service end-users. Over the course of garnering the social evidence to aid policy decisions, it became clear that no stakeholder is able to sustainably operate in isolation. Householders need waste services, policy makers need to design appropriate systems which service users find acceptable both to use and are willing to pay for and service providers need to be able to operate sustainable businesses using appropriate technology, satisfying the service needs of customers and also deriving financial returns on their investment. It therefore becomes imperative for waste policy makers to approach the policy formulation exercise with caution and utilise frameworks that seek to include all relevant stakeholders in the formulation of new policies as well as in the review and adjustment of existing policies.

The evidence from this study was focused primarily on one of many stakeholder groups involved in the waste management system in Lagos - householders. The results have shown that current policies targeted at householders, who are the waste service users, were developed without significant input from householders. The situation is almost akin to a tailor making a fitted suit for a customer without first taking measurements! The fresh and continuous acquisition of scientific evidence to ascertain the scale and needs of waste management, which this research has initiated, forms the platform from which evidence based waste management strategies can and should be developed.

8.5 Summary of Policy Recommendations

For any waste management strategy targeted at householders to succeed, there has to be a targeted social marketing strategy that seeks not only to change behaviour (see Defra, 2005), but also influence behavioural intent. In exceptional cases, some behavioural actions can be changed instantly (as was the case during the WAI campaign, backed by military fiat) but initiating behavioural change may take time and social strategies deployed to achieve this may have to evolve, based on feedback acquired through scientific methods, over time.

Table 8.3 Summary of Policy recommendations

| Action | Target | Intervention Classification | Priority / Goal |
|---|---|-----------------------------|----------------------|
| Step up primary collection rates of solid waste from households and increase provision of waste bins on streets | All householders in Lagos | Enable | Immediate |
| Integrate the informal sector into the waste collection system both to provide primary collection and to increase recycling rates | Informal Sector | Enable | Immediate |
| Establish a framework for inclusivity of all key stakeholders in the waste management system | All stakeholders | Engage | Short to medium term |
| Strengthen PSP operators' terms of service to guarantee fairness and equity among all participating operators as well as favourable tenure of contract to allow for medium to long term investments in equipment. | PSP operation | Encourage | Short to medium term |
| Redesign social marketing campaigns of environmental programmes to improve householder buy-in of waste strategies and compliance with obligations | All householders in Lagos | Engage | Short to medium term |
| Step up source segregation programmes through the informal sector | All householders in Lagos + PSP + Informal Sector | Enable | Medium to long term |
| Integrate pro-environmental waste management policies across all public institutions | Public sector | Exemplify | Short to medium term |

8.6 Summary

This chapter has provided a set of frameworks for integrating scientifically derived social evidence into existing and future waste management policies. Social evidence of householder attitudes and behaviours towards waste management were acquired and examined in light of current waste management policies with the view of highlighting the efficacy of existing policies and then providing suggestions to strengthen them. It was observed that the existing policies are out of line with the ideals of the ISWM model and the potential to manage resources sustainably would be hampered if the current policy strategies remain in place. Critically, the potential loss of existing methods of diverting clean, source segregated materials from the waste stream was highlighted as a major drawback of the current policy strategies.

Policy and technical suggestions, ranging from the immediate to the long term, have been made to step up household collection rates and integrate all aspects of waste management, stakeholders inclusive, into a system in line with the ideals of the ISWM framework for sustainable waste management that builds on existing waste collection networks and practices and gradually evolves into a truly unique waste management system based on current and projected local needs.

By integrating both the resource flow and 4 E frameworks into the ISWM model of sustainable waste management, this chapter has demonstrated, in practical terms, ways of highlighting the contributions of all stakeholders to the success or failure of any given waste management system. The resource flow framework also lends itself to potential quantification modelling to identify the routes of waste, energy and resources with the aim of improving efficiency and sustainability, making it a useful tool for policy makers and advocates in demonstrating system mechanisms and or modelling potential interventions.

The policy suggestions made in this chapter primarily span financial, technical and social interventions; however, there are also requirements for legal interventions in achieving waste management sustainability which have not been covered in the course of this research.

CHAPTER 9. CONCLUSIONS OF RESEARCH

This concluding chapter summarises the main findings contained in this thesis, expands on the local and wider implications of the findings and highlights the contribution to academic knowledge while also suggesting areas for further research.

9.1 Final summary

Waste management remains a challenge for policy makers the world over, especially in low and middle income countries that are categorised as developing countries. In most developing countries, waste management is characterised by failed policies, deployed without the benefit of scientifically based evidence. The focus of this thesis is the management of household waste, more specifically, household attitudes towards waste management systems. The research hypothesis is that the non-acquisition and non-utilisation of household attitudes of householders, as a key stakeholder, in the waste policy formulation process, has compromised the success of waste management interventions in Lagos. The specific objectives of this research included:

- a) A comprehensive review of the historical evolution of household waste management policy in Lagos;
- b) A review of past and current models of evaluating attitudes and behaviour towards waste management;
- c) An examination of the major household waste management issues in Lagos;
- d) An examination of the major factors that influence household attitudes to waste management in Lagos;
- e) The establishment of a baseline of household attitudes and behaviour to waste management in Lagos;
- f) The development of a framework for acquiring and integrating social evidence (household attitudes) into solid waste management policy and;
- g) Suggesting policy recommendations that will influence household attitude changes to waste management in Lagos based on acquired evidence.

9.1.1 Research highlights

This study has demonstrated, through appropriate methodology, a way of testing the research hypothesis through a mixed methodology involving both quantitative and qualitative methods.

The study began by researching the historical background of waste management policies in Lagos from the pre-colonial era till date. From this work, an original timeline showing major environmental interventions in Lagos from the pre-colonial era till the present day was created. This contextualised the waste management issue by highlighting how previous policies have been largely reactive, as responses to significant environmental events in the State.

Next, past methodological frameworks used in the study of environment in the social context and household attitudes to waste management were critically reviewed. The outcome of this review was the selection of an appropriate framework, based on factors influencing pro-environmental behaviour, which was utilised for the study of household attitudes to waste management in Lagos.

A framework, describing the process of integrating social evidence into waste management policy, from acquisition to integration, was developed as a guide for future replication studies and used in this study as a practical guide in explaining each stage in the evidence acquisition and analysis process.

Quantitative and qualitative data, based on questionnaires and focus groups, were acquired through fieldwork studies, and the first baseline of household attitudes towards waste management in Lagos was produced in the course of collating the results of the data analyses.

The baseline data acquired was used to identify householders' barriers to pro-environmental behaviour in Lagos, in the context of internal and external factors.

The barriers to pro-environmental behaviour were then discussed in the context of contemporary waste management policies in Lagos and, to aid the discussion, a framework for waste and resources flow was developed, through this study, to model and highlight the impact policy interventions have on the sustainability of waste management systems. The gaps in the current waste management system were discussed in light of current policies in Lagos and suggestions were made

to improve waste management, particularly in the context of resource extraction – a goal of sustainability in waste management – which is one of the 3 key physical elements of waste management. Among the issues highlighted were:

- a) While the government correctly identifies anti-environmental behaviour as one of the major causes of management problems in Lagos, however, there is a fundamental misunderstanding about the factors that influence these behaviours.
- b) There is a clear gap between strong pro-environmental attitudes and values held by Lagos householders and eventual environmental behaviour.
- c) The KAI programme, which forms the core of the government's strategy for behavioural change, relies on the information deficit model (which assumes Lagos householders are anti-environmental). This approach was found to be ineffective largely because of the recorded strong pro-environmental attitudes of Lagos residents.
- d) Communication and enforcement methods used by government to raise public awareness on their obligations within the ESP and PSP programmes were found to be ineffective and have so far not had any significant impact on behaviour change.
- e) The legal, practical, financial and social aspects of the ESP and PSP programmes have significant flaws that continue to threaten the success of the scheme.
- f) The promulgation of the Lagos State Environmental Sanitation Law makes the activities of waste informal sector workers illegal, thereby inadvertently reducing the quantities and rate of resource extraction and / or recovery from household waste which were already being diverted from landfill and ultimately increasing overall government expenditure for household waste management services.

The analysis of these issues led to the development of policy suggestions to improve the sustainability of waste management policy in Lagos. The policy suggestions include:

- a) Increasing primary collection rates of solid waste from households and increasing provision of waste bins on streets;

- b) Integrating the informal sector into the waste collection system both to provide primary collection and to increase recycling rates;
- c) Establishing a framework for inclusivity of all key stakeholders in the waste management system;
- d) Strengthening PSP operators' terms of service to guarantee fairness and equity among all participating operators as well as favourable tenure of contract to allow for medium to long term investments in equipment;
- e) Redesigning social marketing campaigns of environmental programmes to improve householder buy-in of waste strategies and compliance with obligations and;
- f) Stepping up source segregation programmes through the informal sector.

The results of this thesis' investigation show that householders in Lagos exhibit a high level of awareness of their immediate environment and the potential impact anti-environmental activities have on it.

Also, investigations showed that householders' observed environmental behaviour is not commensurate with the reported attitudes and values, confirming the existence of gaps between how people perceive their environment and how they behave, implying that their attitudes do not directly influence behaviour, which confirms the presence of the value-action gap in this context in Lagos.

Based on the evidence acquired, the methodology and analysis in this study therefore shows that the exclusion of householders from the waste management policy formulation process has contributed to the failure of waste management policies in Lagos.

9.1.2 Study implications

Implications for Lagos

This study has shown that the current regimes of waste management policies are unintentionally promoting anti-environmental behaviour through enforcing householder obligations that are not practical to follow. While past waste management policies in Lagos were designed without input from service users (householders), this study has demonstrated, through policy suggestions, how the current policy regimes can be improved utilising the evidence based policy formulation methodology described in this thesis.

The study has also highlighted the critical gaps in waste management service delivery which are currently being filled by the informal sector, and the potential threat to the entire waste management system if current policy regimes, aimed at eliminating informal sectors from the waste management system, are fully enforced. It also highlighted how the use of waste management legislation to ban all informal sector activities as a way of curtailing the illegal dumping activities of informal sector cart pushers has had the unintended consequence of significantly reducing the rate of material extraction from the waste stream as well as increasing the rate and volume of illegally disposed wastes by households.

Wider Implications

From a policy perspective, incorporating scientific evidence into waste policy formulation at the beginning of the policy formulation process will aid the development of socially relevant and generally acceptable policies. The findings of this research have shown that it is necessary to promote householder stakeholder inclusivity for the success of household waste management policies. Also, for these policy strategies to be effectively implemented, there is need for householder input nearer the beginning of the policy formulation process rather than at the end.

Expressing the waste management issues in developing country cities in terms of resource recovery and or extraction helps in explaining the mechanics of waste movement from the point of generation in households to disposal. The resource flow model enables policy planners to identify the conduits of waste flow as well as highlighting the relevant stakeholders involved in the collection and transportation of waste and material resources. Within the Integrated Sustainable Waste Management (ISWM) framework, this is critical, as it highlights the roles served by each stakeholder and their relevance to the success of a sustainable waste management system. By doing so, it provides a tool for improving the efficiencies of individual stakeholders in contributing towards the integrated system. Finally, it also aids decision makers in designing waste management systems that build on local knowledge, technologies and situations in devising malleable, sustainable waste management systems which may easily evolve as local conditions change.

9.2 Suggested areas for further work

Waste management evidence based research, especially in developing countries, is a relatively new ground. This study highlighted the necessity and potential application of the acquired social evidence in strengthening waste management policy. The following areas may be considered for further work in strengthening the body of knowledge.

- a) Designing a framework for inclusivity in waste management policy formulation and a stakeholder platform for reviewing and revising policies in waste management. How much input, how early?
- b) Implementing practical methodologies to change behaviour in the long term? How may the 4 E's be deployed?
- c) Investigating the design of social marketing techniques to utilise social evidence (based on feedback from stakeholder platforms) to target the factors that influence both behaviour and behavioural intent.
- d) Expanding the waste and resource framework developed in this study to model the volume, mass and characteristics of materials that flow from household waste. This will provide a useful advocacy tool for improving resource extraction and recovery before final disposal.

The roles played by householders as stakeholders in waste management systems are significant. The success of waste management systems, particularly in developing country cities, is partly dependent on householders and therefore, the planning of waste management policies should go beyond merely recognising this key stakeholder, and incorporate them in the waste policy formulation framework. This aim will require the collaborative effort of all relevant stakeholders in the evolution of waste management to meet the development challenges into the 21st century and beyond.

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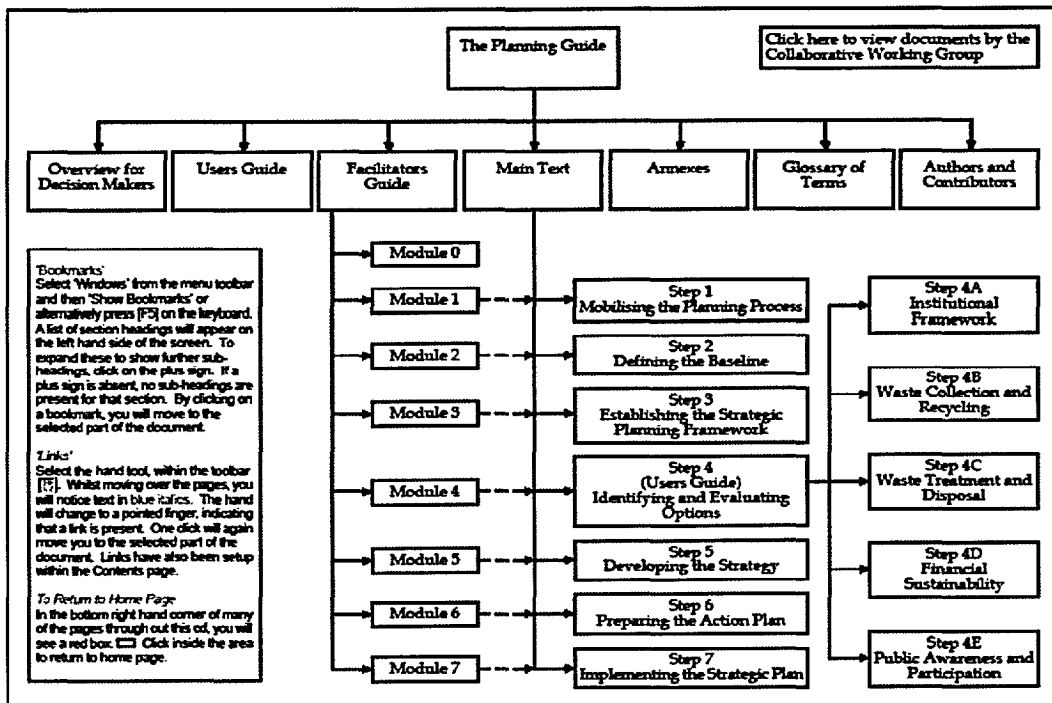
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APPENDIX. A



Appendix A-1: Overview of the World Bank Strategic Planning Guide for Waste Management

APPENDIX. B

Appendix B-1 Quantitative Questionnaire from the 2007 Survey

**ASSESSING PUBLIC ACCEPTANCE AND AWARENESS OF ENVIRONMENTAL LAWS AND
THE DEMAND, AFFORDABILITY AND WILLINGNESS-TO-PAY FOR MUNICIPAL WASTE
MANAGEMENT SERVICES IN LAGOS, NIGERIA**

This survey forms a major part of an MSc final project dissertation and a significant contribution to an ongoing PhD research. Its findings may inform future decisions in improving the quality of waste management services within the State.

Your candid response will be highly appreciated. It will be treated with the **utmost confidentiality** and will be used by the Imperial College London solely for academic and research purposes only.

A. BACKGROUND INFORMATION

A1. In your opinion, what are the two greatest environmental problems in your locality?

| | |
|----|----|
| 1. | 2. |
|----|----|

A2. What is (are) the likely cause (s) of these problems?

| Problem 1 | | Problem 2 | |
|-----------|--|-----------|--|
| 1a. | | 2a. | |
| 1b. | | 2b. | |

A3. Who should be chiefly responsible for dealing with these problems?

| | |
|----|----|
| 1. | 2. |
|----|----|

A4. Which of the following waste management methods are you familiar with?

| | | | | |
|------------|-------------------|--------------|----------|------------------|
| Composting | Recycling / reuse | Incineration | Landfill | Waste separation |
|------------|-------------------|--------------|----------|------------------|

A5. Which of them would be most suitable for your locality?

| | | | | |
|------------|-------------------|--------------|----------|------------------|
| Composting | Recycling / reuse | Incineration | Landfill | Waste separation |
|------------|-------------------|--------------|----------|------------------|

A6. Are you interested in how your waste is disposed?

| | |
|-----|----|
| Yes | No |
|-----|----|

A7. Do you know where your waste is finally disposed?

| | |
|-----|----|
| Yes | No |
|-----|----|

A8. Do you feel it is disposed in an environment-friendly and acceptable way?

| | |
|-----|----|
| Yes | No |
|-----|----|

A9. Are you willing to separate your waste before collection?

| | |
|-----|----|
| Yes | No |
|-----|----|

A10. In what kind of container do you store your waste?

A11. In your opinion, how serious is the problem of refuse collection in your area?

| | | | | |
|--------------|------------------|-------------|---------------|------------|
| Very serious | Somewhat serious | Not serious | Not a problem | Don't know |
|--------------|------------------|-------------|---------------|------------|

A12. How serious is the problem of street littering & illegal dumping of refuse here?

| | | | | |
|--------------|------------------|-------------|---------------|------------|
| Very serious | Somewhat serious | Not serious | Not a problem | Don't know |
|--------------|------------------|-------------|---------------|------------|

| B. WASTE MANAGEMENT PRACTICE | | | | | | |
|---|--|-------------------------|------------------------|---------|--------------|----------|
| B1. Which method do you mostly use for waste disposal? (Rank in order of usage) | | | | | | |
| Store it for reuse | Burn it | Sell to waste buyer | Composting | | | |
| Cart pushers | PSP Operators | Other (Please specify) | | | | |
| B2. How often do you dispose your waste through the following? (Tick as appropriate) | | | | | | |
| | Daily | Twice a week | Weekly | Monthly | Never | |
| Itinerant (Waste buyers) | | | | | | |
| Cart pushers | | | | | | |
| PSP Operators | | | | | | |
| Other method (Please specify): | | | | | | |
| B3. How do you rate the service you get? 5 for very satisfactory and 1 for very poor | | | | | | |
| | 5 | 4 | 3 | 2 | 1 | Cant say |
| Itinerant or waste buyers | | | | | | |
| Cart pushers | | | | | | |
| PSP Operators | | | | | | |
| Other method (Please specify): | | | | | | |
| B4. What improvements would you like to see in your current waste collection service? | | | | | | |
| B5. Are you willing to pay a little extra for an improved service? | | | | | | |
| | | | | | Yes | No |
| B6. Have you been billed for a PSP waste collection service? If your answer is NO, please go to the next section (Section C) | | | | | | |
| | | | | | Yes | No |
| B7. How do you find the billing method? | | | | | | |
| Very convenient | Just Convenient | Inconvenient | Very inconvenient | | | |
| B8. How do you feel about this amount? | | | | | | |
| Unjustifiably high | Expensive but worth it | Moderate and affordable | Very cheap | | | |
| B9. In general, do you think the private companies (PSP) can successfully implement a better waste management system? 5 for "definitely yes" and 1 for "definitely not" | | | | | | |
| 5 | 4 | 3 | 2 | 1 | Cant say | |
| C. GENERAL INFORMATION | | | | | | |
| C1. Your Age: | Below 24 | 25 – 34 | 35 – 44 | 45 – 54 | 54 – 65 | Over 65 |
| C2. Local Govt. Area: | Type of Accommodation: | | | | | |
| C3. No. of people in Residence: | How many members are income-earners? | | | | | |
| C4. Occupation: | Highest Level of Education: | | | | | |
| C5. Ethnic Background: | Gender [Male/ Female]: | | | | | |
| C6. Household Income: | < N1million | | N1million – N25million | | > N25million | |
| NOTES | | | | | | |
| D. WASTE MANAGEMENT OPTIONS | | | | | | |
| If three waste management options are proposed for implementation in your locality, which would you most prefer? Kindly answer the following questions on your preferences. | | | | | | |
| OPTION 1 (Basic Service): | | | | | | |
| <ul style="list-style-type: none"> • A large communal container is placed in your neighbourhood at a central place • Each household empties its waste into this container | | | | | | |

- An attendant sweeps the area and keeps it tidy
- A vehicle takes the container away and empties it when filled

OPTION 2 (Medium Service):

- Similar to option 1 above
- But you won't carry your waste to the communal container
- A cart pusher or other means will be used to collect your waste from door-to-door
- This attracts an extra fee.

OPTION 3 (Higher Service):

- A vehicle would come to the neighbourhood on a scheduled basis and provide a door-to-door service on specified days of the week and pick up times.
- Containers of waste (purchased from the service provider) left at the front of each building, will be emptied into the vehicle and neatly placed back.

D1. Giving consideration to the convenience and the cost, which do you prefer?

| | | | |
|----------|----------|----------|---------------|
| Option 1 | Option 2 | Option 3 | None of these |
|----------|----------|----------|---------------|

D2a. If you prefer **Option 1**, how far are you willing to walk to the communal container?

| | | | | |
|-------------|-------------|--------------|----------------|------------|
| 20m or less | 20m to 100m | 100m to 500m | More than 500m | Don't know |
|-------------|-------------|--------------|----------------|------------|

D2b. How much are you most willing to pay monthly for this option?

| | | | | |
|---------|-----------------|---------------|----------------|------------|
| Nothing | Less than N1000 | N1000 – N5000 | N5000 – N10000 | Don't know |
|---------|-----------------|---------------|----------------|------------|

D3a. If you prefer **Option 2**, will you be willing to pay the extra monthly fee for a door-to-door collection service?

| | | |
|-----|----|------------|
| Yes | No | Don't know |
|-----|----|------------|

D3b. How much are you most willing to pay as the added collection fee for this option?

| | | | | |
|---------|----------------|-------------|--------------|------------|
| Nothing | Less than N250 | N250 – N500 | N500 – N1000 | Don't know |
|---------|----------------|-------------|--------------|------------|

D4a. If you prefer **Option 3**, when would you like the vehicles to collect your waste?

| | | |
|--------------------------|------------------------|--------------------------|
| Early morning before 9am | Anytime in the morning | Anytime in the afternoon |
| Early evening after 5 pm | Anytime during the day | Doesn't matter |

D4b. How much are you most willing to pay monthly for this option?

| | | | | |
|---------|---------------|----------------|----------------|------------|
| Nothing | N1000 – N5000 | N5000 – N10000 | N10000 or more | Don't know |
|---------|---------------|----------------|----------------|------------|

D5. If you're willing to pay for collection, **whom do you prefer to provide the service?**

| | | | |
|----------------------|-------------------|------------------------|------------|
| The local government | A private company | There is no difference | Don't know |
|----------------------|-------------------|------------------------|------------|

D6. If you're willing to pay for collection, **how will you prefer to pay the fee?**

| | | | |
|-----------------|---------------------------------|--------------------------|------------|
| Government levy | Incorporated into Utility bills | Direct & separate charge | Don't know |
|-----------------|---------------------------------|--------------------------|------------|

D7. If you're not willing to pay the full cost of all the collection methods, which of the following alternatives would be most acceptable to you?

| | | | |
|------------------|-----------------------------------|---------------|------------|
| Manage it myself | Less frequent collection of waste | None of these | Don't know |
|------------------|-----------------------------------|---------------|------------|

E. ENVIRONMENTAL LAWS (AWARENESS AND ACCEPTANCE)

E1. How concerned are you about environmental pollution (e.g. air, water and soil)?

5 for "very concerned" and "1 for not concerned at all"

| | | | | | |
|---|---|---|---|---|-----------|
| 5 | 4 | 3 | 2 | 1 | Can't say |
|---|---|---|---|---|-----------|

E2. Is the presence of garbage accumulating in the streets and open spaces a problem in your neighbourhood?

5 for "a very big problem" and "1 for not a problem at all"

| | | | | | |
|---|---|---|---|---|-----------|
| 5 | 4 | 3 | 2 | 1 | Can't say |
|---|---|---|---|---|-----------|

E3. Do you know of environmental sanitation?

If yes go to A4; No go to A5

| | |
|-----|----|
| Yes | No |
|-----|----|

E4. How did you hear about it?

| | | | | |
|----------|--------|-------------------|---------------|-------------------------|
| Radio/TV | School | Posters/Handbills | Word of Mouth | Others (Please specify) |
|----------|--------|-------------------|---------------|-------------------------|

E5. Between what times does the monthly environmental sanitation exercise hold?

| | | | | |
|-----------|------------|------------|----------|------------------------|
| 7am-10 am | 10am- 12pm | 12pm – 3pm | 3pm- 6pm | Other (Please specify) |
|-----------|------------|------------|----------|------------------------|

E6. What areas of your surroundings are you responsible for cleaning during sanitation? (Tick all appropriate answers)

| | | | | | |
|----------------------|-----------|--------|----------------------------|-------------------|------------|
| Inside your compound | Sidewalks | Gutter | Front and back of compound | Sides of compound | Don't know |
|----------------------|-----------|--------|----------------------------|-------------------|------------|

E7. Personally, do you participate in environmental sanitation?
If yes go to question A-6; No go to A7

| | |
|-----|----|
| Yes | No |
|-----|----|

E8. Why do you participate?

| | | | |
|--------------------------|-------------------------------|------------------------|------------------------|
| Because everyone does it | To keep my surroundings clean | Don't want to be fined | Other (Please specify) |
|--------------------------|-------------------------------|------------------------|------------------------|

E9. What are your reasons from the facts above?

| | | | |
|------------------|---------------|---------------|------------------------|
| Busy on the days | Not concerned | Got no reason | Other (Please specify) |
|------------------|---------------|---------------|------------------------|

E10. At what time should your refuse bin be placed outside your premises?

| | | | |
|--------------|-----------------------|-----------------------|------------|
| At all times | At time of collection | At no time whatsoever | Don't know |
|--------------|-----------------------|-----------------------|------------|

E11. Refuse should be packed in which of the following?

| | | | |
|--------------|------------------------|------------|------------------------|
| Plastic bags | Any material available | Don't know | Other (Please specify) |
|--------------|------------------------|------------|------------------------|

GENERAL NOTES.....

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| | |
|--|--|
| <p>A1a-b 0 = don't know 1 = drinking water 2 = human excreta and wastewater 3 = bad roads 4 = drainage and flooding 5 = electricity 6 = refuse collection and nuisance</p> <p>A2a-b 0 = don't know 1 = governance 2 = economic issues 3 = technical issues 4 = anti – environmental issues 5 = urban planning 6 = governance, economic 7 = governance, technical 8 = governance, anti-environmental 9 = governance, urban planning 10 = economic issues, technical issues 11 = economic issues, anti-environmental issues 12 = economic issues, urban planning 13 = technical issues, anti-environmental issues 14 = technical issues, urban planning 15 = anti-environmental issues, urban planning</p> <p>A6-9 1 = no 2 = yes</p> <p>A10 1 = cardboard boxes 2 = nylon bags or sacks 3 = plastic containers 4 = metal containers 5 = sophisticated containers 6 = concrete receptacles</p> <p>A11-12 0 = don't know 1 = not a problem 2 = not serious 3 = somewhat serious 4 = very serious</p> <p>B1a 0= other method 1= store for reuse 2= burn it 3= sell to waste buyers 4= compost 5= cart pushers 6= PSP operators 7= store for reuse, burn it 8= store for reuse, burn it, sell to waste buyers 9= store for reuse, burn it, sell to waste buyers, compost 10= store for reuse, burn it, sell to waste buyers, compost, cart pushers 11= all options 12= burn it, sell to waste buyers 13= burn it, sell to waste buyers, compost 14= burn it, sell to waste buyers, compost, cart pushers 15= burn it, sell to waste buyers, compost, cart pushers, PSP operators 16= sell to waste buyers, compost 17= sell to waste buyers, compost, cart pushers 18= sell to waste buyers, compost, cart pushers, PSP operators 19= compost, cart pushers</p> | <p>20= compost, cart pushers, PSP operators 21= cart pushers, PSP operators</p> <p>A3a-b 0 = don't know 1 = nobody 2 = everybody 3 = local community 4 = local and state government 5 = private sector</p> <p>A4-5 0 = none 1 = composting 2 = recycling/reuse 3 = incineration 4 = landfill 5 = waste separation 6 = composting, recycling/reuse 7 = composting, recycling/reuse, incineration 8 = composting, recycling/reuse, incineration, landfill 9 = composting, recycling/reuse, incineration, landfill, waste separation 10 = recycling/reuse, incineration 11 = recycling/reuse, incineration, landfill 12 = recycling/reuse, incineration, landfill, waste separation 13 = incineration, landfill 14 = incineration, landfill, waste separation 15 = landfill, waste separation</p> <p>B1b 1= store for reuse 2= burn it 3= sell to waste buyer 4= composting 5= cart pushers 6= PSP operators 7= other</p> <p>B2 (a – d) 0= never 1= daily 2= twice a week 3= weekly 4= monthly</p> <p>B3 (a – d) 0= don't use 1= very poor 2= okay 3= satisfactory 4= very satisfactory</p> <p>B4 0= no answer 1= no improvements needed 2= frequent and regular collection 3= provision of free waste bins 4= awareness and enlightenment to enhance civic participation 5= expansion of PSP coverage areas 6= replacement of old vehicles</p> <p>B5 and B6 1= no 2= yes</p> |
|--|--|

| | |
|---|--|
| <p>B7 0= don't know 1= very inconvenient 2= inconvenient 3= just convenient 4= very convenient</p> <p>B8 0= don't know 1= unjustifiably high 2= expensive but worth it 3= moderate and affordable 4= very cheap</p> <p>B9 0= can't say 1= definitely not 2= probably not 3= in between 4= probably yes 5= definitely yes</p> <p>C1 1= "24 and below" 2= "25 - 34" 3= 35 - 44 4= 45 - 54 5= 55 - 64 6= 65 and above</p> <p>C2 0 = others 1= Isolo 2= Mushin 3= Kosofe</p> <p>C3 1 = "1" 2 = "2" 3 = "3" 4 = "4" 5 = "5" 6 = "6" 7 = "7" 8 = "8" 9 = "9" 10 = "10"</p> <p>C4 1 = Self employed 2 = Full time employment 3 = Part time employment 4 = Unemployed 5 = Retired 6 = Student</p> <p>C5 1 = South east 2 = South South 3 = North East 4 = North West 5 = North Central 6 = Middle belt 7 = South west</p> <p>C6 1 = below 2million naira 2 = "2-15million naira" 3 = 15-50million naira 4 = above 50 million naira</p> | <p>C7 0 = other 1 = rent 2 = owned by company 3 = owned by relatives 4 = owned by occupier</p> <p>C8 1 = "1" 2 = "2" 3 = "3" 4 = "4" 5 = "5" 6 = "6" 7 = "7" 8 = "8" 9 = "9" 10 = "10"</p> <p>C9 0 = No education 1 = Primary Education 2 = Secondary School 3 = Vocational training 4 = Tertiary education 5 = Informal Education</p> <p>C10 1 = male 2 = female</p> <p>D1 1 = basic service (option 1) 2 = medium service (option 2) 3 = higher service (option 3)</p> <p>D2a 0 = don't know 1 = more than 500m 2 = 100m to 500m 3 = 20m to 100m 4 = 20m or less</p> <p>D2b 0 = don't know 1 = nothing 2 = less than N1000 3 = N1000 to N5000 4 = N5000 to N10000</p> <p>D3a 0 = don't know 1 = no 2 = yes</p> <p>D3b 0 = don't know 1 = nothing 2 = less than N250 3 = N250 to N500 4 = N500 to N1000</p> <p>D4a 0 = doesn't matter 1 = anytime during the day 2 = anytime in the afternoon 3 = anytime in the morning 4 = early morning before 9am 5 = early evening after 5pm</p> |
|---|--|

| | |
|--|--|
| <p>D4b 0 = don't know 1 = nothing 2 = N1000 to N5000 3 = N5000 to N10000 4 = more than N10000</p> <p>D5 0 = don't know 1 = no difference 2 = private company 3 = local government</p> <p>D6 0 = don't know 1 = government levy 2 = included in utility bills 3 = direct and separate charge</p> <p>D7 0 = don't know 1 = none of these 2 = less frequent collection 3 = manage it my self</p> <p>E1 0 = can't say 1 = Not Concerned at all 2 = partially concerned 3 = averagely concerned 4 = Mostly concerned 5 = Very concerned</p> <p>E2 0 = can't say 1 = Not a problem at all 2 = Minor problem 3 = average problem 4 = Big problem 5 = A very big problem</p> <p>E3 1 = No 2 = Yes</p> <p>E4 0 = Others 1 = word of mouth 2 = Posters/ Handbill 3 = School 4 = Radio/TV 5 = Radio/TV, School 6 = Radio/TV, School, Posters/ Handbill 7 = Radio/TV, School, Posters/ Handbill, word of mouth 8 = Radio/TV, School, Posters/ Handbill, word of mouth, others 9 = School, Posters/ Handbill 10 = School, Posters/ Handbill, word of mouth 11 = School, Posters/ Handbill, word of mouth, others 12 = Posters/ Handbill, word of mouth 13 = Posters/ Handbill, word of mouth, others 14 = word of mouth, others</p> | <p>E5 0 = others (Please specify) 1 = 3pm – 6pm 2 = 12pm – 3pm 3 = 10am – 12pm 4 = 7am – 10 am</p> <p>E6 0 = don't know 1 = incomplete knowledge 2 = complete knowledge</p> <p>E7 1 = No 2 = Yes</p> <p>E8 0 = others (Please specify) 1 = don't want to be fined 2 = to keep my surroundings clean 3 = because everyone does it</p> <p>E9 0 = others (Please specify) 1 = got no reason 2 = Not concerned 3 = Busy on the days</p> <p>E10 0 = don't know 1 = at no time what so ever 2 = at time of collection 3 = at all times</p> <p>E11 0 = others (Please specify) 1 = don't know 2 = any material available. 3 = Plastic bags</p> |
|--|--|

Appendix B-2 Coding Framework for 2007 Survey

| | | Your preferred option | | | |
|--------|-----------|--------------------------------|---------------------------------|---------------------------------|------------------|
| | | basic service (option 1) | medium service (option 2) | higher service (option 3) | none of these |
| Gender | no answer | 24 | 16 | 4 | 0 |
| | Male | 105 | 52 | 95 | 9 |
| | female | 43 | 53 | 59 | 3 |

Appendix B-3 Waste management preference by gender from the 2007 Survey

| | | Your preferred option | | | |
|-----------|------------------------|--------------------------------|---------------------------------|---------------------------------|---------------|
| | | basic service (option 1) | medium service (option 2) | higher service (option 3) | none of these |
| Household | no answer | 8 | 6 | 10 | 2 |
| Income | below 2 million naira | 114 | 54 | 80 | 5 |
| | 2 - 15 million naira | 47 | 52 | 57 | 4 |
| | 15 - 50 million naira | 3 | 8 | 10 | 0 |
| | above 50 million naira | 0 | 1 | 1 | 1 |

Appendix B-4 Waste management preference by household income from the 2007 Survey

| | Frequency | Percent | Valid Percent |
|---------------------------------------|-----------|---------|---------------|
| Other methods | 7 | 10.9 | 10.9 |
| Cart Pushers only | 43 | 67.2 | 67.2 |
| PSP operators only | 12 | 18.8 | 18.8 |
| cart pusher and PSP operators only | 1 | 1.6 | 1.6 |
| cart pusher and other methods | 1 | 1.6 | 1.6 |
| Total | 64 | 100.0 | 100.0 |

Appendix B-5 Waste disposal options currently used by householders wanting to manage waste themselves from the 2007 Survey

ASSESSING HOUSEHOLD ATTITUDES TO MUNICIPAL SOLID WASTE MANAGEMENT ISSUES IN LAGOS, NIGERIA

This survey forms a major part of an MSc final project dissertation and a significant contribution to an ongoing PhD research. Its findings will improve the understanding of the social issues in waste management and may inform future decisions in improving the quality of waste management services within the State.

Your candid response will be highly appreciated. It will be treated with the **utmost confidentiality** and will be used by the researcher and Imperial College London solely for academic and research purposes.

A1. In your opinion, what are the two greatest environmental problems in your locality?

| | |
|----|--|
| 1. | |
| 2. | |

A2. What is (are) the likely cause (s) of these problems?

| | |
|------|--|
| A2a. | |
| A2b. | |

A3. Who should be chiefly responsible for dealing with these problems?

| | |
|------|--|
| A3a. | |
| A3b. | |

A4. How concerned are you about pollution issues in Lagos

| | | | | | | | |
|----------------|--|--------------------|--|-------------|--|---------------|--|
| Very concerned | | Somewhat concerned | | Indifferent | | Not concerned | |
|----------------|--|--------------------|--|-------------|--|---------------|--|

A5. How serious is the problem of street littering & illegal dumping of refuse in your area?

| | | | | | | | | | |
|--------------|--|------------------|--|-------------|--|---------------|--|------------|--|
| Very serious | | Somewhat serious | | Not serious | | Not a problem | | Don't know | |
|--------------|--|------------------|--|-------------|--|---------------|--|------------|--|

A5. How serious is the problem of street littering & illegal dumping of refuse in Lagos State?

| | | | | | | | | | |
|--------------|--|------------------|--|-------------|--|---------------|--|------------|--|
| Very serious | | Somewhat serious | | Not serious | | Not a problem | | Don't know | |
|--------------|--|------------------|--|-------------|--|---------------|--|------------|--|

B. GENERAL INFORMATION

B1. Your Age

B2. Local Govt. Area:

B3. Household Income

B4. Type of Accommodation (in Lagos)

B5. Gender

| |
|--|
| |
| |
| |
| |
| |

Appendix B-6 Quantitative Questionnaire for the 2008 Survey

| | Frequency | Percent | Valid Percent |
|---|-----------|---------|---------------|
| Other methods | 33 | 7.1 | 7.1 |
| Cart Pushers only | 248 | 53.7 | 53.7 |
| PSP operators only | 109 | 23.6 | 23.6 |
| cart pusher and PSP operators only | 14 | 3.0 | 3.0 |
| cart pusher and other methods | 35 | 7.6 | 7.6 |
| PSP operators and other methods | 1 | .2 | .2 |
| cart pushers, PSP operators and other methods | 22 | 4.8 | 4.8 |
| Total | 462 | 100.0 | 100.0 |

Appendix B-7 Waste management methods used by householders

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-----------|---------|---------------|-----------------------|
| no | 227 | 49.1 | 49.1 | 49.1 |
| yes | 235 | 50.9 | 50.9 | 100.0 |
| Total | 462 | 100.0 | 100.0 | |

Appendix B-8 Householders' willingness to separate waste before disposal from the 2007 Survey

APPENDIX. C

| A 2 | 2001 No. 1 | Environmental Sanitation Law |
|---|---|------------------------------|
| Cleanliness of backyard. | <p>(h) not litter, sweep out, or throw ashes, refuse, paper, nylon, and rubbish into any street, public place or vacant plot.</p> <p>2. As from the commencement of this Law, every owner, tenant, and occupier of any building shall ensure the cleanliness of his premises, particularly the backyard and the courtyard.</p> | |
| Cleanliness of toilets/ bathrooms in restaurants/ hotels, etc. | <p>3. As from the commencement of this Law every owner or operator of a restaurant, hotel, night club or school shall ensure the cleanliness of all toilets and bathrooms within the premises.</p> | |
| Use of sanitary litter bins. | <p>4.—(1) No pedestrian shall dispose of any scrap paper, newspaper, candy wrapper, fruit skin and similar refuse anywhere except in litter bins.</p> <p>(2) No person shall use litter bins for household refuse, commercial or industrial waste.</p> | |
| Every commercial vehicle to carry litter bins. | <p>5.—(1) As from the commencement of this Law every commercial vehicle in the State shall carry a litter bin for the use of the passengers.</p> <p>(2) No passenger shall throw any litter, fruit skins, scrap paper or other item onto the road from any vehicle.</p> <p>(3) Where no bin is provided the driver shall be liable for any contravention of subsection (2) of this section.</p> | |
| Obstruction and improper disposal or dumping of refuse. | <p>6.—(1) All side-walks shall be free from obstruction to allow free flow of pedestrian traffic.</p> <p>(2) All streets shall be free from obstruction and from construction or demolition materials.</p> <p>(3) No person shall use another person's dustbin in front of his or another's building far or near from where he resides or works.</p> | |
| Disposal of refuse. | <p>(4) No person shall dump indiscriminately any domestic, industrial or commercial waste, or discarded vehicle spare parts or tyres along highways, roads, channels, gorges, vacant land directly or through private operators except at designated refuse disposal sites.</p> <p>7. No person shall dispose of domestic refuse or waste except through a Private Sector Participation Operator.</p> | |
| Prohibition of pasting of handbills by individuals and protection of Government posters, etc. | <p>8. No person shall —</p> <p>(a) paste any handbill, poster, notice, sign or advertisement that bears the name of his organization or business on side-walks, trees, bridges, abutment, public dustbin hydrant, highway or on any street without the permission of the appropriate authority;</p> <p>(b) tear down, deface or destroy any notice handbill, sign, advertisement or poster put up or posted by or under the direction of the Government or any of its agency.</p> | |

(2) All tenements, markets, motor parks, stores and other places of business shall patronise appointed private operators for the collection and transportation of domestic, garden and commercial refuse to designated landfill sites.

(3) Any person who fails to patronise the appointed private refuse operators shall be liable to fines and/or other penalties as specified under the Schedules to this Law.

First and
Second
Schedules.

20.—(1) An application for registration shall be made to the Local Government in such terms and manner as may be prescribed.

Application
for
registration

(2) Notwithstanding the provisions of subsection (1) of this Section, the Local Government may not register a private refuse collection outfit unless such outfit satisfies the conditions governing the issuance of a licence.

21.—(1) The Ministry shall upon the payment of a prescribed fee, issue a licence to any person who applies under this Law and has satisfied the conditions prescribed by the Local Government.

Licence.

(2) Any licence issued pursuant to Subsection (1) of this Section shall be renewed every twelve calendar months from the date of issuance.

(3) The fees payable by an applicant under the provisions of this Section shall be subject to review every 12 calendar months.

22. Where it appears to the Local Government that the provisions of this Law are not being carried into effect by any outfit or that the outfit is not run in the best interest of health, the Local Government in consultation with the Ministry may—

Power to
cancel or
suspend
licence.

- (a) suspend the registration of such an outfit until the conditions which caused the order of suspension to be issued have been rectified; or
- (b) cancel the licence of such of an outfit.

23. For the purpose of this Law, refuse disposal sites for deposit of refuse or waste shall be designated by the Ministry in collaboration with the Local Government.

Designation
of refuse
disposal sites.

24. Any private refuse collection operator who fails to register with the Local Government and to obtain a licence from the Ministry is guilty of an offence and shall be liable to fine or imprisonment as specified under the Schedules to this Law.

Penalties.

First and
Second
Schedules

25. For the purpose of this Law any person to whom a licence has been issued under this Law shall be treated as a contractor of the Local Government.

Private refuse
collectors to
be treated as
contractors
of the Local
Government.