GOVERNMENT ACTIVITIES AND PSYCHO-SOCIAL FACTORS AS DETERMINANTS OF SOLID WASTE MANAGEMENT BEHAVIOUR IN SOUTH WESTERN NIGERIA

BY

KOFOWOROLA ADEDAYO ADEROGBA

B.Sc. (Hons.), M.Sc. (Geography) (Ibadan), PGDE (Ago-Iwoye), M.Ed. (Ibadan)

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KOFOWOROLA ADEDAYO ADEROGBA

CERTIFICATION

I certified that this work was carried out by Kofoworola Adedayo ADEROGBA (Matriculation No: 21339) under my supervision, in the Department of Adult Education, Faculty of Education, University of Ibadan, Ibadan

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(Supervisor)
Professor Deborah A. Egunyomi
Adult Education Department
University of Ibadan
Ibadan, Nigeria.

DEDICATION

This work is dedicated to all those striving for better urban environment

ABSTRACT

This study examined the influence of government activities (delineation of dumping sites, provision of bins and transportation facilities, environmental policy formulation, advocacy, establishment of regulatory agencies) and psycho-social factors (attitudinal disposition, aesthetic values, neighbourhood appreciation, income, family/unit size, cultural affiliation, academic qualification, knowledge and awareness of environmental education) on solid wastes management behaviour in Southwestern Nigeria.

The descriptive survey research design was adopted. The multi-stage sampling procedure was used in selecting 2465 households, 310 commercial units and 370 institutions in the six state capitals in Southwestern Nigeria. Three instruments were used: Psycho-social Factors Scale (r=0.84), Government Activities Scale (r=0.73) and SWMB Scale (r=0.78). These were complemented with 18 sessions of Key Informant Interview with heads of households, commercial units and institutions. Two research questions were answered and four hypotheses tested at 0.05 level of significance. Data were subjected to descriptive statistics, Pearson product moment correlation, multiple regression and content analyses.

Government activities and psycho-social factors jointly correlated significantly with SWMB among households ($F_{(3, 2452)}$=16.834), commercial units ($F_{(3, 306)}$=3.654) and institutions ($F_{(3, 366)}$=18.288). Their relative contributions were: institutions (12.0%), households (2.0%) and commercial units (2.0%). Relatively, the independent factors predicted SWMB as follows: Households- psychological factors (β=.53), social factors (β=.039) and government activities (β=-.43); Commercial units- psychological factors (β =2.72), government activities (β=1.25) and social factors (β=.02); Institutions- psychological factors (β=.384), social factors (β=.35) and government activities (β=.06). Solid wastes management behaviour correlated significantly with households' attitudinal disposition (r=.18) and neighbourhood appreciation (r=-.10) but aesthetic value did not. For commercial units, SWMB correlated significantly with all psychological factors: attitudinal disposition (r=.157), aesthetic value (r=.148) and neighbourhood appreciation (r=-.117) while for the institutions, SWMB also correlated significantly with all psychological factors: neighbourhood appreciation (r=-.35), attitudinal disposition (r=.30) and aesthetic value (r=.12). Significant difference existed in attitude to SWM among commercial units ($\bar{x}$=2.50), institutions ($\bar{x}$=2.25) and households ($\bar{x}$=1.25). Also significant difference existed in general knowledge about SWM among households ($\bar{x}$=2.75), commercial units ($\bar{x}$=2.25) and institutions ($\bar{x}$=2.25). Although households had a better SWM awareness, they had poor attitude compared to commercial units and institutions. Interviews revealed that urban dwellers were kn owledgeable about SWM but had poor disposition to its management due to long-standing tradition.

Delineation of dumping sites, provision of bins, attitudinal disposition and knowledge of environmental education positively determined solid waste management behaviour among households, industrial and institutional organisations. Therefore, urban dwellers' disposition towards proper management of solid wastes needs to change, while all the strategies to improve SWMB must take into consideration these identified factors.

Keywords: Psycho-social factors, Government activities, Solid waste management behaviour, Nigerian Southwestern cities

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Abbreviations	
Df	Degree of Freedom
E.P.A.	Environmental Protection Agency
F	F Ratio (ANOVA Value)
F.E.P.A.	Federal Environmental Protection Agency
Fig.	Figure
G.D.P.	Gross Domestic Product
H.B.V.	Hepatitis B Virus
H.C.V.	Hepatitis C Virus
H.I.V.	Human Immunodeficiency Virus
H.N.D.	Higher National Diploma
I.D.I.	In-depth Interview
K.A.I.	Kick Against Indiscipline
K.I.I.	Key Informant Interview
K.N.C.	Keep Nigeria Clean
M.S.W.	Municipal Solid Waste
M.S.W.M.	Municipal Solid Waste Management
N.C.E.	National Certificate in Education
N.C.F.	Nigerian Conservation Foundation
N.E.S.T.	Nigerian Environmental Study/Action Team
N.G.O.	Non-Governmental Organization
OND	Ordinary National Diploma
P.S.P.	Private Sector Participation
P.T.A.	Parents Teachers Association
R.E.B	Responsible Environmental Behaviour
S.D	Standard Deviatiom
S.O.P.T	Sense-of-Place Theory
Sig.	Significant
t	T-test
T.P.B.	Theory of Planned Behaviour
T.R.A.	Theory of Reasoned Action
U.K.	United Kingdom
U.N.	United Nations
U.N.D.P.	United Nations Development Programme
U.N.E.P.	United Nations Environmental Programme
U.N.E.S.C.O.	United Nations Educational, Scientific and Cultural Organization
U.S.A.	United States of America
V.B.N.	Value-Belief-Norm
W.H.O.	World Health Organization

W.A.I. War Against Indiscipline

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Human activities create wastes, the way they are handled, stored, collected and disposed pose risks to the environment and to public health (Zurbrugg, 2003). Increase in human activities has raised the magnitude of wastes generated and the extent of its environmental impact. Over time, man continues to alter the structure and nature of the environment through mining and burning of fossil fuel, destruction of forest and release of wastes through domestic, industrial and agricultural processes. In these processes, human activities generate many by-products, generally seen as useless and discarded as wastes (Akinro, Ikumawoyi, Yahaya & Ologunagba, 2012). These massive wastes subsequently find their ways into the ground, air and water every year.

Solid wastes could be defined as non-liquid and non-gaseous products of human activities, regarded as useless. Wastes could take different forms such as refuse, garbage and sludge (Leton & Omotosho, 2004). According to Leton and Omotosho (2004), solid waste is found in urban and rural areas. While rural area generates waste often organically rich and degradable, urban wastes are characterised by cultural practices of society which are unfriendly to the environment.

Different countries adopt different categorisation for statutory requirement. Solid wastes are categorised into three major groups (Low, 1990); domestic refuse (solid waste generated by markets, food centres, households and commercial premises and so on); industrial refuse (does not include hazardous and toxic waste which requires special treatment, handling and disposal); and institutional solid waste (solid waste from government offices, schools, hospitals, recreational centres). Apart from households, the waste characteristics and quantities vary in markets/ commercial centers, schools, airports,

railway stations, bus stands and so on. At airports, in addition to the waste from airplanes, solid waste is also produced in offices, restaurants, shops, kitchens, restrooms, maintenance areas, cargo operations, hangars, construction and demolition. He avers that typical waste characteristics of developing nations are: high waste densities, high moisture contents, large organic fraction, and cities with sweeping as well as open ground storage, characterised by large amount of dust and dirt. A number of studies have indicated that the inappropriate handling and disposal of waste poses health risks to people who may be directly exposed and to people near waste facilities, particularly children and scavengers who may become exposed to more infectious wastes and risky diseases (Oke, 2008; Program for Appropriate Technology in Health (PATH 2009); World Health Organization, 1999 & 2002). Solid waste also hosts substantial amount of fungi. Out of about 100,000 species of fungi, about 100 are pathogenic to animals and man (Anthony & Elizabeth, 1981). Fungi cause infection to hair, nail, skin and lungs. Toxins generated by Aspergillums flatus can cause liver cancer and fatty degeneration of liver in people who eat contaminated foods. Solid waste production is a function of land use, its composition is inversely proportional to possible soil damage and bacterial contamination of the environment (Achudume and Olawale 2009; Lober 1996; Omuta 1999; Shakibaie, Dhakephalker, Kapadnis, and Chopade, 2009). The World Health Organisation (2005) estimated that each year, there are about 8 to 16 million new cases of Hepatitis B Virus (HBV), 2.3 to 4.7 million cases of Hepatitis C Virus (HCV) and 80,000 to 160,000 cases of Human Immunodeficiency Virus (HIV) due to unsafe injections and mostly due to very poor waste management systems (Townsend & Cheeseman, 2005).

Nigeria as a country is noted to be urbanising at an astonishing rate, (National Population Commission (NPC), 2006; & Nabegu, 2010). The Nigerian urban population increased by 20 per cent in 1970 to about 38 per cent in 1990, with over 40 million out of

the nearly 110 million people living in the cities and towns (Lawal, 2010; National Bureau of Statistics (NBS), 2008). In particular, the cities and towns of South Western Nigeria account for 40 million urban dwellers. This seemingly envious position has serious implications for the provision of urban facilities and services such as water, sanitation, road and waste disposal in the South Western cities of Nigeria. The ability or inabilities of the inhabitant to address the multiplicity of problems that usually accompany the largest unmet demands are aggravated by different environmental problems. These include air, water and noise pollution as well as waste disposal problem, which unfortunately are the most serious environmental problems in South Western Nigeria, (Ogwueleka, 2003; Onibokun, 1999; & United Nations, 1996).

Cities in Nigeria, being among the fastest- growing in the world (Onibokun & Kumuyi, 1996) are faced with the problem of solid waste generation. The implication is serious when a country is growing rapidly and the wastes are not efficiently managed. Waste generation in Nigeria has been of great concern to every stakeholder. Of the different categories of wastes being generated, solid wastes had posed a hydra-headed problem beyond the scope of various solid waste management agencies in Nigeria (Geoffrey, 2005), as the streets experience continual presence of solid waste from residential and commercial activities. For example, one of the main problems facing cities in South Western Nigeria and which has become an intractable nuisance is open and indiscriminate dumping of refuse, human and animal faeces (Omoleke, 2004). Specifically, piles of decaying garbage, substantially domestic in nature are found in locations in the heart and around Ibadan city including the Ibadan-Lagos Expressway (Omoleke, 2004; see Plates a, b & c in the Appendix). The implication is that cities of South Western Nigeria have a lot of wastes to cope with (Akinro et. al, 2012).

Emerging from this is the problem of solid waste management, seen as a major environmental threat to cities in developing countries. United Nations Development Programme (UNDP)(1997) notes that 151 Mayors from around the world ranked solid waste disposal problem as the second most urgent urban challenge surpassed only by unemployment and followed by urban poverty (Agagu, 2009).The growth of cities in recent time in Africa, projected to be 759.4 million and 1.2 billion in 2030 and 2050 respectively has been recognised as a major threat to city environmental quality, leading to series of environmental degradations that reduce quality of life and urban environment (UN Habitat, 2008; & Fadare, 2010).

Solid waste management has gained notoriety in Nigeria today because of its visibility and the embarrassment it is to the image of the nation (Akinro et al, 2012). Only few state capitals have been able to put in place fairly sustainable urban waste management programmes. Reports show that 48 per cent of the waste generated in urban centres are dumped in unauthorised places such as open spaces, drains, streams and roadsides, 23 per cent is heaped in compounds as community's dumping sites and only 29 per cent is properly disposed through government facilities provided and private sector participation (NBS, 2009). According to Alakinde (2012), the volume of waste generated in Nigerian urban areas sometimes overwhelms urban administrative capacity such that planning for their collection and disposal becomes a major challenge.

The quantity and rate of solid waste generation in various states of Nigeria depend on the population, level of industrialisation, socio-economic status of the citizens and predominant commercial activities. Nigeria, having a population of 160 million generates above 0.58Kg solid waste per person per day as indicated in some cities as follows: Abeokuta, Ogun State (0.60Kg/person/day), Ado-Ekiti, Ekiti State (0.71Kg/person/day), Akure, Ondo State (0.54Kg/person/day), Ile-Ife, Osun State (0.46Kg/person/day) and

Ibadan, Oyo State (0.71Kg/person/day) (Adewumi, Ogedengbe, Adepetu & Fabiyi, 2005). About 55.20Kg per day of solid wastes were estimated to be generated in the traditional city of Oyo in Oyo State (Abel & Afolabi, 2007). Another source, Norman (2000) estimated the population of Lagos to be 10.3 million, reports the solid waste generation of 3.7 million tons per year in 1990, and 401Kg per capita per year for Ibadan in 1997. Lagos generates an estimated 276 kg of waste per capita annually, less than African Green Index Average of 408 kg. Municipal solid waste is disposed of at the state's three landfills and two temporary sites. Waste pickers operate informally, although the city has tried to curb their activities, (Economic Intelligent Unit, 2011).

The volume of waste does not actually constitute the problem but the ability or inability of governments, individuals and waste disposal firms to keep up with the task of managing waste and the environment.

Various models have been developed to show the key elements in environmental behaviour so that an understanding of the underlying mechanisms and framework for identifying and organising psycho-social and Government Activities influencing waste minimisation and its management is gained (Stern, 2000). Some of these include attitudinal factors (Katzev & Johnson, 1987), behaviour-specific dispositions (Black, Stern & Elworth, 1985), neighbourhood affectation, residential location, knowledge and awareness of environmental education, family unit/size, cultural/religious affiliation, and income, delineation of dumping site, provision of bins/transportation facilities, advocacies and environmental policy formulation/implementation. The literature has shown that the different causal variables are important (Gardner and Stern, 1996; & Stern, 2000) & may be shaped into specific actions by individuals and the society as a whole (Dahlstrand & Biel, 1997).

Clear indications are that personal/social values with the combination of specific plans or strategies (what bin to use for what item, who is responsible for the bin?) can result in changes in behaviour and commitments to follow a waste management plan. Studies have shown that a key barrier to waste minimisation is that waste is "someone else's problem" (Agunwamba, Egbuniwe & Ogwueleka. 2003; & Lawal, 2010). This is why the combination of the knowledge found in the area of psychology of behaviour and motivation in the area of environment and waste needs are to be considered when discussing potentials in waste management and corporate environmental behaviour (Murphy, 1995; Venetoulis & Talberth, 2008).

1.2 Statement of the Problem

In Nigeria, effective management of waste relies on the combined voluntary behaviours of individual households and institutions. For example past governmental laws and regulations such as War Against Indiscipline (WAI), Keep Nigeria Clean (KNC), Kick Against Indiscipline (KAI), every-last Saturday of month environmental sanitation exercise, Clean Up and Green Up and other various attempts at maintaining good disposal habit had largely failed. This is as a result of inability to include citizens' socio-cultural attitude and consideration for the infrastructures available.

Also, a substantial number of environmental interventions have been carried out focusing on changing attitudes in order to promote the desired environmental behaviour in the area of waste management (Lawal, 2010). Unfortunately many of these initiatives have had limited success: Till date and during the course of the introduction of these interventions government monitoring agencies continue to experience high rate of environmental offenders, court litigations and sabotage against these interventions when people have not been duly educated, provided with the necessary infrastructures and their opinions and attitudes were not taken into consideration in the design and implementation

of these policies. There is dearth of study on what factors are responsible for the negative behaviour demonstrated by the inhabitants of these cities looking at the influence of the combination of governmental activities, psychological and social factors on solid waste management behaviour particularly in the urban centres in south western Nigeria.

This therefore, raises the salient questions: What are the psycho-social and governmental factors that could predispose environmentally friendly solid waste management behaviour among inhabitants of urban centers? To what extent can such psychological factors like attitudinal dispositions, aesthetic values and neighbourhood environmental affectations influence positive solid waste management behaviour? Will social factors such as academic qualification, family unit size, cultural/religious affiliation, knowledge and awareness of environmental education, income status influence solid waste management behaviour? Would delineation of dumping site, provision of bins and transportation facilities, advocacies and environmental policy formulation/implementation on the part of the government help to bring about positive and friendly solid waste management behaviour in the urban centres of South Western Nigerian? Therefore, following from the foregoing, the main objective of this study is to determine the extent to which psycho-social and governmental factors predisposes solid waste management behaviour among residents of urban centres in South Western Nigeria.

1.3 Objectives of the Study

The aim of this study is to determine the extent to which government activities and psycho-social factors predisposes positive solid wastes management behaviour among residents of urban centres in South Western Nigeria. The specific objectives of the study were to:

1. determine the relationship between delineation of dumping site, provision of bins and transportation facilities; advocacies and environmental policy

formulation/implementation on the part of the government and solid wastes management behaviour.

2. ascertain the relationship between psychological factors (attitudinal dispositions, aesthetic values, environmental/ neighbourhood appreciation) and solid wastes management behaviour.
3. determine the relationship between social factors (academic qualification, family/unit size, cultural affiliation, knowledge and awareness of environmental education and income) and solid wastes management behaviour.
4. ascertain the inhabitants' perceptions of, attitude to, and general knowledge about solid wastes management behaviour and environmental education.

1.4 Research Questions

The under-listed research questions used for this study are:

RQ_1: To what extent will governmental activities, psychological and social factors determine solid wastes management behaviour among households in urban centres in South Western Nigeria?

RQ_2: To what extent will government activities, psychological and social factors determine solid wastes management behaviour among commercial units in urban centres in South Western Nigeria**?**

RQ_3: Will government activities, psychological and social factors determine solid wastes management behaviour among public institutions in urban centres in South Western Nigeria?

RQ_4: What are the respondents' perceptions of, attitude to and general knowledge about solid wastes management behaviour and environmental education in the selected cities?

1 .5 Significance of the Study

The expected outcome of this study would be of practical interest and usefulness to governments, policymakers, environmental planners, waste management agencies, industrial organisations, individual families and the society at large with respect to knowing the various ways by which environmental norms and standards can be improved. It indicates directions and depth of environmental education for sustainable physical environment for the citizenry. The anticipated result of this study should also help government in formulating and generating modalities of enforcing appropriate policies to improve waste management practices for different stakeholders in the society. The expected outcome of this study would also help open new areas of related research, thereby widening the scope of knowledge in this study area.

1.6 Scope of the Study

This study examined the extent to which government activities and psycho-social factors will determine solid waste management behaviour of residents of urban centres in South Western Nigeria. The study was delimited to the six capital cities of State of Osun, Oyo, Ogun, Ekiti, Ondo and Lagos states. The choice of the six states was based on the submission of Mabogunje (1980); Onibokun and Kumuyi, (1999); and WHO (2005); that the six states were the dirtiest and highly populated states in South Western Nigeria due to high volume of domestic and industrial wastes, high industrial and auxiliary human activities (Mabogunje, 1980; Olanrewaju and Ilemobade, 2001)

1.7 Operational Definitions of Terms

Government Activities

Government activities identified influence solid waste management behaviour that result from and through the government policy implementation and practices. The activities identified and measured in this study include delineation of dumping site,

provision of bins, transportation facilities, advocacies, environmental policy formulation/ implementation that influence both corporate and individual environmental behaviour.

Psycho-social Factors

Psycho-social factors refer to the combinations of the dispositional, environmental and socio-cultural factors identified to influence corporate and individual solid waste management environmental behaviour of the subjects in this study. The psycho-social variable is made up of: attitudinal disposition, aesthetic values, neighbourhood affectation, academic qualification, family unit/size, cultural affiliation, knowledge and awareness of environmental education and income status.

Solid Waste Management Behaviour

This refers to positive or negative waste management practices as enacted in the collection, separation, storage, transportation, transfer, processing, treatment, and disposal of wastes by stakeholders and practitioners, participants in this study. Positive behaviours include the disposal of solid waste in clean, safe and environmentally friendly manner; initiative seeking to reduce the generation of waste; activities that reduce the environmental impact of waste and initiative to maximise collaboration with regulators in the adoption of environmentally acceptable behaviour in waste management.

However, negative solid waste management behaviour include indiscriminate dumping of refuse, burning that causes environmental pollution to soil and atmosphere .The disposal of waste in a manner that breeds diseases and harmful organism in environment.

Municipal Solid Waste

These refer to the urban solid wastes generated by residents, manufacturers, business enterprises and governments in the urban centres in the south western cities. This type of waste includes predominantly household wastes and industrials wastes.

Solid Waste Management

Solid Wastes management refers to activities that surround the collection, transportation, recycling or disposal, and monitoring of all solid wastes in hygienic, safe and economic manner so as to reduce their harmful effect on health, the environment and /or aesthetics.

Pro-environmental Behaviour

Pro-environmental behaviour is environmentally friendly attitudes such as dumping wastes at designated places, separation of wastes, reduction of wastes, or enacting behaviour that harms the environment as little as possible or even benefits the environment.

Sustainability

Sustainability refers to the capacity of the stakeholders to enact a solid waste management and systems that endures. This also refers to the long-term maintenance of ecological, economic, political and cultural aspects of sound waste management practices that support human wellbeing. This requires the reconciliation of environmental, social equity and economic demands. Thus, sustainability is the enactment of solid wastes management behaviour that meets the needs of the present without compromising the future.

CHAPTER TWO

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

The review of literature undertaken in this chapter covers government activities and psycho-social as determinants of solid waste management behaviour. In addition, the theoretical/conceptual framework is provided.

2.1 Conceptual Framework

Literature review affords research endeavour to give account of what has been published on the research interest by accredited scholars and researchers. This study explores the critical points of current knowledge including substantive findings as well as theoretical and methodological contributions to waste management behaviour. The review begins with conceptual definitions of waste management. The study analysed how government activities and psycho-social factors identified play significant role in solid wastes management behaviour. Solid wastes management behaviour in Nigeria and peculiarity of Nigerian attitude to waste management is presented. The theoretical framework utilised is reasoned action theory to explain how government activities and psycho-social factors identified play significant role in waste management behaviour of urban dwellers.

2.1.1 Concept of Solid Waste Management

Humanity has always produced waste because it is a settled law of nature that all biological organisms must generate wastes no matter their status. Waste is more easily recognised than defined, something can become waste when it is no longer useful to the owner or it is used and fails to fulfil its purpose. Solid waste is any useless, unwanted or discarded material that is not liquid or gas. The Environment Protection Act (1990) describes waste as:

> …. any substance which constitutes a scrap material or an effluent or other surplus substances arising from the application of any process; and

> substance or article which requires to be disposed of as being broken, worn out, contaminated or otherwise spoilt, but does not include a substance which is explosive….

Typical classification of solid waste as suggested by Hosetti and Kumar (1998) include the following:

Garbage: Putrescible wastes from food, slaughterhouses, canning and freezing industries.

Rubbish: non-putrescible wastes either combustible or non-combustible. These include wood, paper, rubber, leather and garden wastes as combustible wastes whereas the non-combustible wastes include glass, metal, ceramics, stones and soil.

Ashes: Residues of combustion, solid products after heating and cooking or incineration by the municipal, industrial, hospital and apartments areas.

Large wastes: Demolition and construction wastes, automobiles, furniture's, refrigerators and other home appliances, trees, fires etc.

Dead animals: Households pets, birds, rodents, zoological animals, anatomical and pathological tissues from hospitals.

Sewage sludge: These include screening wastes, settled solids and sludge.

Industrial wastes: Chemicals, paints, sand and explosives.

Mining wastes: Tailings, slug ropes, culm piles at mining areas

Agricultural wastes: Farm animal manure, crop residues and others.

Traditionally, these wastes are categorised into the following five types.

Residential: It refers to wastes generated mainly from dwelling, apartments and consists of leftover food scrapes, vegetables, peeled material, plastics, wood pieces, clothes, broken utensils, electronic appliances, ashes, and so on.

Commercial: This mainly consists of grocery materials, leftover food, glasses and metals, used needles and syringe, papers, packaging materials, tyres and tubes, industrial wastes

and those from stores, hotels and brothels, markets, shops and hospital, maternity homes, dispensaries, health care centres and others.

Institutional: The wastes generated from schools, colleges and offices include, paper, plastics, glasses and others.

Municipal: This includes dust, leaf litter, building debris and treatment plant sediments. These arise from various activities like demolition, construction and reconstruction, road/street rehabilitation and cleaning and land scraping.

Agricultural: This mainly includes spoilt food grains, vegetables, grass, animal dropping, poultry remains, tools and equipment generated from fields and farms.

These list of wastes remain in-exhaustive however, this study is focused on three modes of waste which include household, institutional and industrial solid wastes.

Waste management simply means the collection, storage, treatment and disposal of waste in such a way as to render them harmless to human and animal life, the ecology and environment generally (Agunwamba, Egbuniwe and Ogwueleke, 2003). It could also be said to be the organised and systematic dumping and channelling of waste through or into landfills or pathways to ensure they are disposed-off with attention to acceptable public health and environmental safeguard (Ogwueleka, 2009). Proper waste management will result in the abatement or total elimination of pollution (Agrawal & Gibson, 2001).

Solid waste management has been variously defined. Solid waste management, according to Blower (1993), involves treatment before disposal to separate certain waste streams or to compact the waste and get its volume reduced. United Nations (1997) defines solid waste management as the handling process of solid waste materials from generation at the source to its disposal. Similarly, the World Bank (2000) defines it as effective control of production, storage, collection, transportation, processing and disposal of wastes in a sanitary and aesthetically acceptable manner. The National Urban

Development Policy (2006) also defines it as the generation, separation, collection, transportation and disposal of waste in a way that takes into account public health and aesthetic quality of the environment. Solid waste management is a planned system of effectively controlling all solid waste in a sanitary, economic, and aesthetically acceptable manner.

In the urban centres, solid waste management is regarded as Municipal Solid Wastes (MSW); and it is defined to include refuse from households, non-hazardous solid waste from industrial, commercial and institutional establishments (including hospitals), market waste, yard waste, and street sweepings. Municipal Solid Wastes Management (MSWM) refers to the collection, transfer, treatment, recycling, resources recovery and disposal of solid waste in urban areas. The goals of Municipal Solid Waste Management are to promote the quality of the urban environment; generate employment and income; ensure healthy environment and support the efficiency and productivity of the economy.

Solid waste management has emerged as one of the greatest challenges facing state and local government environmental protection agencies in Nigeria (Ancheta, 2004). According to him, solid waste management in Nigeria is characterised by inefficient collection methods, insufficient coverage of the collection system and improper disposal of solid waste. In most urban centres in developing nations at the moment, it is either thrown in the open dumpsites, illegally disposed-off in the sea or on unused land, in the streets or burnt in piles in compounds and or wherever they are deposited. Burning of municipal waste is common in towns and cities of Nigeria as man and animals are continuously exposed to destructive effects of carcinogenic toxins from burning as a result of poor management. The volume of solid waste being generated continues to increase at a faster rate than the ability of the agencies to improve on the financial and technical resources needed to parallel this growth (Ancheta, 2004).

2.1.2 Psychological Factors and Solid Waste Management Behaviour

Many psychological studies have attempted to identify correlation factors such as attitudes and barriers affecting waste management behaviour (Tucker, 1999). While acknowledging the need for socio-political and economic measures, government strategies for waste management in Nigeria, emphasis has been drawn to the role of individual consumers and households and a change in societal attitudes. Most studies have achieved partial success, that is, they have been able to explain some of the observed variations, though few have been able to explain the major part of the variations. The study revisits this literature in giving explanations for urban waste management behaviour. This section discusses the psychological variables identified in this study which include attitudinal disposition, personal values to waste management and affectation for the environment.

Personal Value and Solid Waste Management Behaviour

People's attitudes influence not only the characteristics of waste generation, but also the effective demand for waste collection services. Taking responsibility for one's action is a dying art in the world today, as majority of individuals never admit they are wrong. Whereas, doing something relating to this context means being accountable for one's action to the environment. Individual attitude to waste disposal in Nigeria leaves more to be desired. Refuse and domestic waste will not constitute a strange sight to Nigerians whose streets are littered with tons of garbage from animal to human carcasses. A lot of littering goes on in the environment; and the streets and avenues may have been ignored and not cleared (Karshi, 1981).

A situation whereby a landfill that has been closed to the public is still being used as a dump site calls for questioning. Also where waste is placed on the middle of roads, inside and by the sides of gutters, and roadside does not augur well for effective waste management. Despite the fact that illegal communal waste dumps indiscriminately located

in public places have been officially cancelled, several illegal refuse collection points were indiscriminately created by residents which pose health hazard and loss of environment aesthetics. Karshi (1981) has identify that the single most critical problem confronting waste management in metropolitan area is not equipment or manpower but indiscriminate dumping of wastes on road sides, in gutters and other unauthorised dumping grounds by residents of the city. Many households are mainly interested in receiving effective and dependable waste collection service within their immediate vicinity. Only few are concerned with the broader objective of environmentally sound waste disposal, rather, households give priority to water supply and electricity (Nabegu, 2010). President Buhari having correctly identified bad attitude as the main constraints to waste management, a nationwide campaign called "War against Indiscipline" (WAI), was enacted in March, 1984 by a military decree. The WAI campaign was aimed at tackling the most anti-social Nigerian characteristics such as indiscipline, corruption and lack of environmental sanitation, while instilling public moral, social order and civic responsibilities among Nigerians (Egun, Nkonyeasua & Kingsley, 2011). The non-continuance/ implementation of the "War Against Indiscipline" by successive Governments/ Administrations has led to a rapid decline in the social responsibility/discipline among citizens especially the youths which accounts for 52 per cent of the population (Egun et al 2011). This decline has through various ways/ forms impacted significantly on the environment negatively.

Attitudinal Disposition and Solid Waste Management Behaviour

The waste generated by a population is primarily a function of the people's consumption patterns and, their socio-economic characteristics. At the same time, waste generation is conditioned to an important degree by people's attitudes towards waste, their patterns of material use and waste handling; interest in waste reduction and minimisation;

the degree to which they separate wastes and the extent to which they refrain from indiscriminate dumping and littering (Mainieri, Barnett, Valdero, Unipan, & Oskamp, 1997). They opine that people's attitudes influence not only the characteristics of waste generation, but also the effective demand for waste collection services, in other words, their interest in and willingness to pay for collection services. Attitudes may be positively influenced through awareness-building campaigns and educational measures on the negative impacts of inadequate waste collection with regard to public health and environmental conditions and the value of effective disposal. Such campaigns should also inform people of their responsibilities as waste generators and of their rights as citizens to waste management services. Attitudes towards solid waste may be positively influenced by public information and educational measures, improved waste handling patterns can hardly be maintained in the absence of practical waste disposal options.

Studies have shown that individuals with concern for the environment will practice pro-environmental behaviours, like recycling, composting, and source reduction (Stern, 2000). Research has also shown that the environmental attitudes of the public have been increasing and expanding to include various social groups in developed countries, other than just the urban, well-educated and affluent groups (Mainieri, et al, 1997) More specifically, in the United States, Canada and Great Britain, recycling programmes have also expanded, making recycling possible for more people and therefore reducing the effect of environmental concern (Schultz, Oskamp & Mainieri, 1995).

Derkson, Linda & Gartell (1993) compare communities in Edmonton Canada that had varying access to recycling programmes and found that environmentally concerned individuals will recycle if provided the opportunity and, more importantly, even unconcerned individuals will participate when granted access to the programme. Schultz & Oskamp (1996) investigated whether general environmental attitudes and concern are

strong predictors of behaviour when the effort required for the behaviour is high. The research showed that environmental concern predicts recycling behaviour when the effort required for action was high. Instead, behaviours have proven to be more significantly influenced by specific attitude about recycling, like knowledge of waste reduction method, access to programmes, time, effort and convenience (Vining & Ebreo, 1992; Schultz & Oskamp, 1996; Derkson & Gartell, 1993). The past recycling research suggests that an individual's level of environmental concern may not guarantee participation in a recycling programme, other factors may relate more significantly to their actual behaviour.

In a study about environmentally-responsible consumerism, Ebreo, Hershey, & Vining, (1999) observe that general concern for the environment, in addition to social factors and more specific concerns about the effect of the product on human and animal life might be related to purchase decisions and other waste reduction behaviours. Ebreo, Hershey, & Vining, (1999) suggest that environmental concern and attitudes towards the environment are still significant in relation to source reduction, specifically in relation to environmentally-responsible consumerism. The difference between source reduction and recycling in terms of an individual's concern for the environment suggests that environmental concern is still a significant predictor of behaviour in situations where the waste education strategy is not widespread.

Public support for recycling, as measured by opinion, tends to be very high, often over 85 per cent (De Young, 1990). Recycling participation rates show considerable variation with one review of several programmes showing 54.86 per cent (De Young, 1990). These rates also vary with type of material recycled, such as newspapers, cans and bottles. What is particularly interesting about the high participation rates in recycling is that the public receives few tangible immediate benefits while the community as a whole

receives longer term benefits in environmental protection and conservation of resources. One explanation for high level of participation in recycling is that it reflects largely intrinsic motivation such as personal satisfaction related to participating in an activity to conserve resources and be frugal (De Young, 1985 & 1986) and "because it seems like the right thing to do" (De Young, 1990). The importance of intrinsic motivation is underscored by their longevity relative to external ones. One study of paper recycling showed that when external reward such as monetary incentives is removed, there was an immediate return to baseline levels of participation (Witmer & Geller, 1976). Ebreo and Vining (2001) examined reasons and justifications for peoples' self-reported recycling and source reduction behaviours', and found that a number of social variables were related to the waste reduction behaviour. Specifically, employment status, occupation, gender and type of housing were related to recycling behaviour, and the same variables as well as household size were related to source reduction. Oskamp, Harrington, Edwards, Sherwood, Okuda, and Swanson, (1991) conducted a survey in a suburban community with an existing curb side recycling programme, and found that most of the social variables tested, specifically age, education as well as having a liberal political orientation did not distinguish between recyclers and non-recyclers. However, the study found that recyclers had significantly higher family incomes than non-recyclers and were more likely to own their own homes, which proved to be the most significant factor in predicting recycling behaviour.

Aesthetic Values, Environmental Appreciation and Solid Waste Management Behaviour

Environmental aesthetics encompasses natural and built features of the physical environment. Human beings have always valued pleasing natural landscapes; delight in the elements that make up the natural landscape: the colours, textures, shape, and varied

patterns. These natural resources are valued for something more than their mineral, food, and energy contributions: they are valued for their beauty, design, sensory stimulation, expressiveness and symbolic value. Cities, towns and villages have their aesthetic features which are expressed in their architecture, plazas, streets, parks, galleries, and concert halls. Cities of today exhibit greater or lesser degrees of planning but their scale and complexity have been greatly magnified by increased density, accelerated demands for service and by new possibilities for technological developments. Physical and psychological environments thereby converge to establish the experiences and the concepts of environmental aesthetics. (Kals, Schumacher, & Montada, 1999)

The handling and separation, storage and processing of solid wastes at source before collection is the second of the six functional elements in the solid waste management system (Siong, 2005). Infrequent collection and rapid decomposition of waste provide an attractive feeding and breeding site for flies, rats, cockroaches and other scavengers (Sunil, 2005). Similar to mosquito and rodent, flies and cockroach-related problems tend to arise when there is food source. Flies are attracted to waste or unsanitary condition (Sabesan, 2001). They breed in close association with man, in human and animal waste. They can carry various diseases, including cholera, diarrhoea, typhoid and dysentery. Houseflies are mechanical carriers of diseases, which mean they do not bite as mosquitoes do (Pan America Health Organisation, 2002); therefore, germs or pathogens are picked up by houseflies and carried to human food. Residents who live near the communal storage may be at risk. Mackenzie, Davis and Cornwell (1998) asserts that garbage decompose rapidly particularly in warm weather and produce disagreeable odours. Thus, improper schedule of waste collectors can create nuisance to community.

2.1.3 Social Factors and Solid Waste Management Behaviour

Social variables have proven to be inconsistent predictors of recycling (Schultz Oskamp & Mainieri, 1995) and other waste reduction behaviour. For example, Chu, Hornik & Kuan (1995) found that no single social variable was identified as a strong predictor of waste management behaviour. On the other hand, some other studies have found that socio-demographic variables are important correlates of waste management behaviour (Stern, 2000). Many studies in the last two decades on socio-demographic variables and environmental perception have helped in understanding people's views, and thinking about the environment. They have attempted to predict environmental awareness and attitudes of people based on their socio-demographic characteristics (Stern, 2000).

Academic qualification is considered the most important variable in explaining a household's behaviour towards good solid waste management service. Mbeng, Phillips & Fairweather, (2009) affirm that education is the most important variable in the given analysis. Education is always considered a crucial factor to achieve high degree of awareness. In that study, higher education positively affects household willingness to participate in improved solid waste management services. Within the given categories of education, the highest education that is post graduate has a positive and significant relationship with the given household demand for better solid waste management services. This indicates that as the number of highly educated family member increases, family will be more willing to contribute for better services. Thus higher education has significant influence upon public willing to pay for waste management services. For instance, studies have found a positive association between higher education and waste reduction (Samdahl & Robertson, 1989).

Socio-Economic Status (Income) is another very important determinant of household demand for any service. With the increase in family income, people can spare

money for improvement in their living standards. Research has shown that people who fall in the upper middle class are willing to have better manage solid waste and want to contribute monetarily for this purpose. The other two income categories, low and middle income class failed to represent any significant relationship with willingness to pay for waste management service (Khattak, Khan & Ahmed, 2009). Nevertheless, it is still understandable because those households which fall in the low income class might be left with no money after fulfilling their basic necessities. Thus they will find it difficult to spare money for other social issues. On the other hand, households that come under the middle income class have careless attitude or they are already spending a fair amount of money to get their home and surroundings clean (Khattak, Khan & Ahmedl, 2009).

Income and Solid Waste Management Behaviour

A positive relationship between income levels and waste generation at the household level has been established (Nabegu 2008; Rotich, Zhao & Dung, 2006). Income and affluence have often been found to be positively correlated with waste generation (Chang, Pan & Huang, 1993; Dayal, Yadav, Singh, & Upadhyay, 1993) although some studies found inverse relationship; there are negative findings (Rathje & Murphy, 1992) as well. Waste generation is conditioned to an important degree by people's attitudes towards waste especially their patterns of material use and waste handling, their interest in waste reduction and minimisation, the degree to which they separate wastes and the extent to which they refrain from indiscriminate dumping and littering (Zurbrugg, 1999).Access to a garden strongly determines the level of home composting or the collection of organic waste; Tenure and dwelling - home owners are more likely to recycle than tenants, particularly where they are in high-rise blocks where lack of space inside and outside the home becomes more of a pressing issue. Car

ownership, which partly reflects affluence, reflects access to recycling facilities where household collection is not available (Zurbrugg, 1999).

It is interesting to note that middle-income households gave away more than 50 per cent of their recyclables to door-to-door collectors (young boys in pushcarts) in some part of urban centres, who in turn re-used some and sold the rest to junkshops. Plastic wastes, which have a high potential for recycling, had the highest reuse value for households, although almost half of these wastes were disposed instead of collected for recycling. High socio-economic status has been identified to be positively related to recycling (Vining & Ebreo, 1990; Oskamp et al, 1991).

Knowledge, Awareness of Environmental Education and Solid Waste Management Behaviour

There are studies that have examined public, households and students' knowledge and attitudes towards waste management (Barr, Gilg & Ford, 2001; Walling, Walston, Warren, Warshay & Wilhelm, 2004; Meyers, Glen & Anbarci, 2006; Sha'Ato, Aboho, Oketunde, Eneji, Unazi & Agwa, 2007). Ignorance coupled with poverty may be adduced to the poor waste management habit of most people in Nigeria especially in the densely populated areas of the state (Sha'Ato et al, 2006). People can be seen defecating in broad daylight on highways or women urinating on sidewalks or gutters in full glare of the public or where a man or woman parks his or her car and throws waste on the street. Nigerians are permanently accustomed to dirt. Evidence of this can be seen every day by way of indiscriminate discharge of garbage into drains and at times on the highways.

They assert that one aspect of improvement on waste management in developing nations is to promote environmental awareness largely through formal and informal education, wide dissemination of environmental information through environmental publication, seminars, workshops, lectures and the mass media. Illiteracy is high in

developing countries and waste management education occurs mostly in informal ways. Life styles and value systems, aspirations and behaviours and level of education can play important roles in mismanagement of solid waste. Lack of general public awareness of waste management is a result of high levels of mingled waste and littering. Since people are not aware of disposal mechanisms, they simply throw all the waste together in un-segregated form. Fruits like oranges, mangoes, peas are eaten and the seeds and fruits litter the streets. Banana peels, corn husks and nutshells are scattered all over cities as residents simply throw them away anywhere any time (Sha'Ato, et al 2006).

Cultural/Religious Affiliation and Solid Waste Management Behaviour

In developing countries, informal solid waste handling is frequently done by disadvantaged social groups. This is because a fast growing low - income residential community is comprised of diversity of social and ethnic groups (Schubeler, 1996). The recognition of people doing this work runs into cultural attitudes and taboos surrounding filth and dirt, because the urban population regard waste handling as dirty and a low-status job (Kettl, 1994; Schubeler, 1996; Medina, 2000). In some cases, informal waste workers belong to religious, caste or ethnic minorities. Social discrimination is a factor that obliges them to work under completely unhygienic conditions as waste collectors or sweepers (Schubeler, 1996).

Medina (2000) reports that up to 2 per cent of the population in Asian and Latin American cities that depend on waste picking to earn their livelihood often form discrete social groups or belong to minorities. Waste picking is taken as adaptive response to scarcity by these disadvantaged populations. In East African cities there are general negative attitudes or cultural barriers towards compost made by Community Based Organisations. Surveys showed that a minority (5%) of farmers in Dar es Salaam, Tanzania rejected compost derived from waste because they associated it with diseases

and dirt that may be in the waste stream (JICA, 1997). The social marginalisation and culture perceptions do not regard solid waste management activities to be just like any other employment opportunity so, ultimately discourages those who are engaged in it.

Cultural systems are organised innately by a community to fit and support their beliefs and values. What waste includes may be any number of various objects and ideas depending on the culture. For example, spitting on the ground is considered as "dirty" and out of place in some cultures, but not in others. As any botanist will tell you, there is no such thing as a "weed", it is simply a plant that is growing some place where someone has decided it ought not to. In the case of people who dump their wastes due to cultural reasons, the essential idea is that they do not conceive of wastes dumped openly on the ground to be "out of place". The practice of open dumping and open dump sites, are perceived "to belong" in their conception of how the world should be and are considered appropriate (i.e. befitting). Wastes were discarded near their dwellings and had to be left behind as they moved on. In some tribal communities, there are dumping grounds that were shared by the community. Open waste disposal thus fit appropriately with the holistic conception of wastes as part of the earth. Wastes "belong" to the ground.

Kendie (1998) draws attention to cultural elements of sanitation. He believes all cultural derivatives such as beliefs; perceptions and attitudes can be modified or changed through education. The perception of waste also bothers on perception recognition of people working as waste managers and cultural attitudes and taboos surrounding filth and dirt, because the urban population regards waste handling as dirty and a low-status job (Kettl, 1994; Schubeler, 1996; Medina, 2000). In some cases informal waste workers belong to religious, caste, or ethnic minorities.

2.1.4 Governmental Activities and Solid Waste Management Behaviour

Situational factors in this literature relate to contextual and structural factors that influence individual decision-making. In terms of the structural context, a number of studies have shown that waste management behaviour do not exist outside the context within which it is being generated in terms of infrastructure and managing authorities which basically suggest that state policy and governmental strategies towards waste management play significant role in the enactment of responsible waste management behaviour (Omoleke, 2004). In other words, government policies and activities can buffer or constrain waste management behaviour of its citizens. This section explores government activities that play significant role in urban dweller's waste management behaviour.

Environmental policy formulation/implementation and Solid Waste Management Behaviour

Common problems for Municipal Solid Waste (MSW) management in most developing nations include institutional deficiencies, inadequate legislation and resource constraints. According to Visvanathan and. Tränkler (2003), there is a need to practice integrated solid waste management approach such as: Incorporation of more environmental and economic friendly concepts of source separation; recovery of waste; legitimisation of the informal systems; partial privatisation and public participation. Although some governments have formulated policies for environmental protection, it is only the implementation of those policies that become problematic. In developed countries, for example, United Kingdom, government on May 24th, 2007 published the Waste Strategy for England which sets out a vision for sustainable waste management, involving the strategy's objectives, action plan for different parts of the society, the policy approach and indicators and targets (Defra, 2008). Further, the Waste Strategy Board was

established to provide leadership within and across government and also vested with the responsibility of taking forward the delivery of the strategy and developing new policy actions needed for smooth implementation of the strategy (Defra, 2008).

The policies should create solid waste management bodies at the national, provincial, city and municipal levels that will ensure its proper implementation. Governments should support their efforts to clarify the goals and priorities for waste management and environmental protection. Policy supports apply to the formulation of appropriate legislation, bye-laws, regulations and standards and the integration of solid waste management into the general legal framework for public health and environmental protection. Special attention would be paid to legislation and regulations for control and disposal of industrial and hazardous wastes. Support is also required for strategic planning of solid waste management at national and local government levels, responding to the specific needs of large and small cities. The implementation of development strategy must be a long-term process involving cooperation and coordination between various actors and partners. Each contribution needs to build upon existing activities and programmes, avoiding duplication and promoting linkages and synergy effects between on-going efforts (Schübeler, 1996)

Establishment of Regulatory and Monitoring Bodies

To achieve sustainable and effective practice in waste management in developing nations, regulatory and monitoring body saddled with such responsibility will help achieve high environmental performance. It is important to look at the roles, interests and power structures prevalent in waste management services as studies have shown in several countries that cooperation and coordination between the different stakeholder groups like city council, provincial government, service users, NGOs, community based organisations, the private sector (formal and informal) and donor agencies, will ultimately

lead to increased sustainability of the waste management system, such as changes in behaviour and sharing of financial responsibilities (Marchettini, Ridolfi & Rustici, 2007). On the other hand, ignoring certain activities or groups will result in decreased sustainability of the system, for example in the form of negative public health effects or increased unemployment (Nyachhyon, 2004).

Increase in the number and scope of activities for environmental education and awareness programmes should include monitoring and enforcement. When restrictions through legislation and regulations are placed on the disposal of waste to the environment, there tends to be an increase in the cost of waste treatment which gives rise to the need for increased waste minimisation (Crittendon & Kolaczkowski, 1995). Studies have shown where environmental standards and policy instruments such as landfill tax, Eco-management and Audit Scheme created in response to stringent legislation aimed at ensuring that businesses operate in compliance with regulations and improve environmental performance (Bates & Phillip, 1999; Phillips, et al., 2001). In an effort to achieve efficient waste management, the UK government introduced the Environmental Protection Act, which aims to control and reduce pollution by setting standards of management and control and places responsibility on all businesses that deal with waste to manage it properly (Pitt, 2005). Consequently, these measures have increased business efforts to be resource-efficient in the course of its operations (Bates & Phillip, 1999; Phillips, et al., 2001).

Location of Dumping Ground and Solid Waste Management Behaviour

Waste are thrown in a more or less uncontrolled manner and the file of waste does not allow free access to waste points and often produce unpleasant and hazardous smoke from slow burning fires. The present disposal situation in Nigeria is expected to deteriorate even more with rapid urbanisation, as settlements and housing continue to

encircle the existing dump and the environmental degradation associated with these dumps directly affect the population. Many residents in Nigeria do not have authorised dumping sites for waste. This confirms a nationwide survey by the Federal Office of Statistics (FOS) (1978) which found that 52 per cent of urban households in Nigeria do not have access to authorised dumping ground. The same problem applies to most of the land fill sites which are located within highly dense residential areas and now it is difficult to find dump sites which are located at a reasonable distance from the collection area.

Guagnano, Stern, & Dietz (1995) tested a model in which attitudinal factors and external conditions act in combination to influence behaviour. In their conceptualisation, external conditions included a broad range of factors, physical, financial, legal and social, all potentially facilitating or curtailing behaviour. Among the strongest evidence of the effects of external factors, they found that possession of a bin had a significant effect on recycling behaviour. Contextual factors such as location of dumping site and location of waste dumps have been identified to have a direct effect on participation in waste management behaviour through the mechanism of psychological empowerment (Zimmerman & Rappaport, 1988).

Knowledge/Awareness of Environmental Education and Solid Waste Management

Education campaigns which also address common reasons for poor attitude-behaviour correspondence are likely to be more successful than those that just provide more general information about the seriousness of environmental problems. For example, social psychologists state that attitude-behaviour correspondence is increased when the consistent behaviour is easy and less costly to perform (Oskamp, 1977). One of the appeals of environmental education has been that it is liked by policymakers and others who are concerned about behavioural freedom because it engenders ecologically responsible behaviours. To these people, the suggestion is that persuasive principles as

well as accurate information should be used by those creating environmental educational awareness. For example, Burn & Oskamp (1986) observe that the use of persuasive communication incorporating normative social information, accepted beliefs and practices moderated a significant increase in recycling behaviour among urban residents.

Knowledge of waste reduction methods can either motivate individuals to participate or inadequate knowledge can be a barrier to waste management behaviour. In a study investigating motivating factors and barriers to recycling behaviour in New Jersey, Simmons and Widmar (1990) answered the question: "what influences individuals to reduce their production of garbage and participate in recycling programmes?" The study concluded that lack of knowledge and lack of personal salience and efficacy were barriers that interfered with the motivating effect of a person's sense of responsible action and conservation ethics. Therefore, without the information and perception of individual ability to reduce waste, an individual will not act on his/her internal sense of responsibility by participating in waste reduction programmes.

In a review of the empirical psychological research regarding recycling behaviour, Schultz, et al. (1995) observe that recyclers in the past were characterised to have a high level of social responsibility, whereas presently, internal responsibility must be accompanied with knowledge of how and what to recycle. A meta-analysis of recycling research dating back to 1968 by Hornik, et al. (1995) show that there are four groups of variables that predict recycling behaviour, where the strongest predictors are internal facilitators, such as having knowledge of how and what to recycle and awareness of the importance of recycling. Increasing the knowledge of waste reduction for the targeted population has been seen as a necessary method of increasing public participation in waste reduction programmes.

Accessibility to a structured, institutionalised programme that is easy and simple to use, has been described as the most important determinant of recycling behaviour Derkson & Gartell 1993). Waste reduction strategies require individuals to invest personal resources like time, space, money and effort. Hornik, et al. (1995) discuss these barriers and categorises them as 'external facilitators,' one group of four groups of variables that predict recycling behaviour.

2.1.5 Concept of Sustainable Development

Sustainability has been used more in the sense of human sustainability on planet Earth and this has resulted in the most widely quoted definition of sustainability as a part of the concept of sustainable development, of the Brundtland Commission of the United Nations on March 20, 1987: "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. As defined by the United Nations, it is not universally accepted and has undergone various interpretations (Holling, 2000; Kates, Redcliff, 2005; Parris & Leiserowitz, 2005). According to Holling (2000), what sustainability is, what its goals should be and how these goals are to be achieved are all open to interpretation. For many environmentalists 'sustainable development' is an oxymoron - as development seems to entail environmental degradation, he asserts. The conventional approach of solid waste management has been to manage the removal of the solid discards from the immediate vicinity of human settlements. This resulted in mechanised systems of collection and transportation of waste in the industrialised countries and the landfills to bury the waste. In the later part of the 20th century, it was realised that the societies will not be able to master the waste avalanche. The waste management had to change its focus from "efficient removal" to waste avoidance, minimisation and recycling options with higher priority.

Ever-increasing amounts of solid waste accompany rapid economic and population growth in developing countries, challenging municipalities' ability to sustainably manage it all. Solutions to this problem may be found in a proactive system by attacking the source of increasing waste problems and developing integrated waste-management systems and a non-expensive alternative (Durand, 2013).

Global production of municipal solid waste is expected to double in the next 15 years. This increase is primarily attributable to the developing nations, driven by the combined effect of strong urban growth and economic development. Waste management in these countries is a major challenge for the years ahead: the negative external impacts of solid municipal waste are serious, including in particular major impacts on the environment and on health, as open waste dumps remain the dominant processing mode in developing countries (Durand, 2013).

Every year, developing nations spend some US$46 billion on managing their municipal solid waste. Public authorities are finding it difficult to raise the necessary finance to meet these cost they are compelled to concentrate on urgent needs – collection – to the detriment of processing, the result being that they incur high costs while achieving poor performances (Durand, 2013). In these circumstances sustainable waste management appears difficult to envisage. The concept of the waste sector as a whole, integrating all the various players involved within an overarching vision of the waste chain, is not yet sufficiently developed. At the same time the regulatory environment is not robust enough to reassure investors. Despite all these challenges, the waste sector can offer genuine economic opportunities. After all, in an environment where the costs of energy and raw materials are escalating, waste represents an attractive resource; processing it can become a profitable business – leading to the establishment of sustainable management practices within the sector (Durand, 2013).

Sustainable development is an implied development without destruction, it is the judicious use of non-renewable resources for the present and future generations, which are non-renewable resources, must be used at a judicious rate, neither too fast nor too slow and to ensure the natural wealth they represent is converted into long-term wealth as they are used (Taiwo, 2009).

In Nigeria, Taiwo, (2009) identifies sustainable development as a development that does not jeopardise future development, meaning that in the efforts to explore and exploit the natural resources to serve Nigerians; there is the need to ensure economic development, while protecting the environment. He notes that there must be a balance between levels of development and the stock of natural resources, that is, development must be at a level that can be sustained without prejudice to the natural environment or to future generations. Therefore, if there is to be sustainable development in waste management in Nigeria, the availability of land (for landfill), human resources, plant and equipment and other tools including capital must be readily available. There is need to protect the future for the next generation by cleaning up the environment of all types of waste, taking into consideration physical and population development of the cities, as such, waste management must mean the collection, keeping, treatment and disposal of wastes in such a way as to render it harmless to human and animal life, the ecology and the environment generally (Redcliff, 1992).

Sustainability is consuming resources faster than their production and not polluting the environment in an irreversible way. However, latent function of the sustainable environment paradigm include the desire to break, change and improve the anti-environmental attitude, behaviour and cultural practices promoting non-sustainable waste management practices through increasing generation of waste and poor waste management practices. These resources may be environmental, economic or societal.

Many people believe they are living sustainably because they are doing better than others around them by recycling their waste or avoiding non-biodegradable waste. However, there are certain practices and situations where people irrespective of their background display high level of environmental waste generation impunity during festive occasions.

Sustainable wastes management depends on various factors including policies and drivers of a particular country, waste generation rates, composition and others. There are many drivers in waste management, waste generation and waste composition, divided into four broad categories – human, economic, environmental and institutional, all intrinsically related to each other. The human category remains the most virulent driver of the increasing rate of waste generation and wasteful depletion of the natural resources through its consumption pattern, cultural habit and wasteful life styles. Thus an imperative for sustainable environment is the achievement of sustainable life styles for the human elements through breaking due to ever increasing waste generation resulting from population expansion.

Sustainable waste management means a commitment to building the most innovative, forward-reaching waste, recycling and diversion programme to align what is best for business with what is best for the environment and communities. Today, the scope of what it means to be environmentally responsible has changed. It is not just about hauling away trash or recycling it, it is about transforming our world, improving quality of life, protecting wildlife, creating clean, renewable energy and leaving a better place for future generations.

The environment must be able to endure waste management practices. A sustainable waste management system could be practiced indefinitely without any lasting damage to the environment. Even with some precautions, putting wastes in a hole in the ground cannot be continued indefinitely, particularly when increase in the rate at which

waste is generated continued to increase. Kates, et al, (2005) aver that in many areas of the US, there is sufficient land to allow burying of wastes for quite some times this cannot continue forever, as has already been realised in many parts of the world and some parts of the US. Ultimately, landfilling is not sustainable.

Deluca (2000) observes that people must also be able to endure and live with waste management practices.

> As social creatures, we must also be able to successfully live with each other in stable communities. What does that have to do with solid waste management? We all generate waste, and what each of us does with that waste affects everyone else, so we agree to manage our solid wastes together. Solid waste management is one of the basic human functions that bind us together as members of a community. Practiced at the regional level, waste management detracts from the social and economic strength of local communities. It undermines the sustainability of our communities.

Based on these ideas, sustainable waste management will require that we minimize landfilling and, to the extent possible, manage wastes locally. In addition, each individual should be aware of the impacts their waste management choices have on the environment and on their community and that they actively participate in making those choices.

Substantial waste reduction must be an ultimate goal, but it is a long-term goal, (Deluca, 2000). In the meantime, efforts need to be focused on reuse and recycle. According to Deluca, there are numerous alternative waste management options currently available to help in the reuse and recycle. The problems that these alternative systems have faced in the past are many; they include such factors as cost, limited proven technologies and reliance on volunteerism, inappropriate expectations, limited knowledge, inefficiencies, safety and plain old inconvenience. To get beyond these problems, "we must be willing to change factors promoting the waste generation rate. Fully implementing the three reuse, recycle and renew is a key element of sustainable waste management.

Sustainable waste management will only work if everybody - the private sector, the local and regional governments and the general public - work together. No single entity can make it happen on its own. Literature have shown that the ideas presented here are not new (Ratner (2004), Deluca (2005), Abel & Afolabi (2007), Abah & Ohimain (2011). People across the nation have been recycling, composting, and working toward waste reduction in various forms for years, but there are long ways to go: There is the need to learn as much as possible about alternative waste management options and how to help achieve sustainability. There is the need to pass on information to the public and decision-makers; provide more incentives for waste management rather than waste disposal and solid waste managers, regulators and engineers need to follow the predecessors' footsteps, work together to overcome the difficult hurdles and take solid waste management to the next level. Therefore Deluca (2005) & Evans (2006) concluded that we need to make sustainable waste management our goal for the new millennium.

2.1.6 Solid Waste Management Behaviour: Concepts and Issues

Waste management behaviours involve the process of collection, storage, transportation, treatment and disposal of waste in such a way as to render them harmless to plants, human and animal lives and the environment as a whole (United Nations Development Programme, 1997). The processes involved are undertaken by individuals, organisations or institutions either collectively or individually. These behaviours converge under three themes which suggest that all or part of waste may be recycled, reused or disposed. Recycling represents the process of transforming waste into a useable material or product (UNDP, 1997). Reuse of goods can entail usage of the same good (or part) by another entity (perhaps after refurbishment). Disposal is the dispossession of materials without the intent of further use and generally means burying, burning or simply dumping. An efficient waste management system is one that provides ecologically sound

disposal option for waste that cannot be reduced, recycled, composted, combust or processed further (Ali & Cotton, 1999).

Recycling

Recycling waste is one of the commonest ways of managing waste in developed countries (Hickman & Eldregde, 2005). It involves the production of a useful material from waste garbage which has enough value to justify recycling parts of it. It is the process of separating, collecting, processing, marketing and ultimately using a material that would have been discarded. It also helps in the source reduction. It has benefits similar to other forms of source reduction. It reduces reliance on landfills and incinerators. It protects human health and the environment by removing the harmful substances from the waste stream. It also conserves natural resources by reducing the demand for raw materials. To produce a useful material out of waste, another useful material is used up. Recycling reduces the volume of the waste that has to be finally dumped, which means a reduction in pollution at the waste sites. The re-cyclables may be separated by various stakeholders at various stages. A recycling centre can be established at the same location where residents deliver wastes (Hickman & Eldregde, 2005).

The concept of recycling has acquired a moral tone and governments across Europe have succumbed to the political pressure by introducing policies on recycling which require progressively more materials to be dealt with in this way (Atieza, 2007) in fact the use of this system is encouraged.

Collection of Wastes

Collection of solid wastes is the most costly part of waste management; a proper collection system design can reduce the cost significantly. Collection system is operated either by the waste management established in the different states or private collectors. This aspect is left with the local decision makers of the respective areas (Environmental

Protection Agency, 1989). Collection frequency is based on the cost as well as requirements of the locality. The residential wastes usually contain food and other putrescible materials. Frequent collection of these wastes is important for health and aesthetic reasons. Local climate conditions often have a strong influence in determining the collection frequency. In hot and humid climates, solid wastes must be collected at least twice a week, as the decomposing may produce bad odour and the leachate may create unhygienic scene (EPA, 1989). According to the Agency, the quality of solid waste containers/bin on site also affects the collection frequency. Closed containers allow collection frequency up to three days, whereas open and unsealed containers may require daily collection. Collection efficiency mainly depends on the demographic factors (such as income groups and community type and so on) of the area where collection takes place. Based on the intensity of waste production, the points or collection stations are designed to ease disposal.

Containers and Storage

It is necessary to provide facilities at the point of generation of waste for storage until they are collected. The design of an efficient collection system needs careful selection of type and size and location of containers. Small containers are used for single-family households while large containers are required for residential, industrial and institutional units. The containers may be stationary or the type hauled to the disposal stations for emptying before return to the storage site. The materials used for preparing the containers should be light, recyclable, easily moulded, smooth and resistant to corrosion (EPA, 1989). According to the EPA (1989), the use of communal containers is highly dependent on the local practice and culture and attitude of the people towards the wastes. The containers are placed at bus stops on major roads. Longer distances are encountered in areas with high population densities and areas with inadequate waste bins.

The size of the crew for a particular community depends on the labour force and equipment cost, collection methods and route characteristics. The crew size has a great impact on the overall collection systems. With the increase in collection costs there may be decreasing frequency of collection, increased dependency on the residents to sort out the materials and increased automation used in collection. These aspects have resulted in smaller crews in municipalities in recent years. The size of the collection crew depends on the type and size of collection vehicle used, space between the houses, waste generation rate, collection frequency and labour cost. The collection programme must consider the route that is suitable. By proper planning, energy can be conserved and working hours and vehicle fuel consumption can be minimised. The size of each route depends on the amount of waste collected per stop, distance between the stops, loading time and traffic conditions. If the disposal site is far from the collection area, a transfer station may be justified where smaller collection vehicles transfer their loads to larger vehicles, which further carry the wastes to longer distances (EPA, 1989).

Collection Vehicles

The collection vehicles may be small and simple or large, complex and energy intensive. The most commonly used vehicle is the dump truck fitted with a hydraulic lifting mechanism (UNDP, 1997).

Small-scale Vehicles

These are commonly used for waste collection in many developing countries, as well as in rural hilly areas of developed countries. They are suitable in places where relatively less waste is produced. The drawbacks of these small vehicles are limited to travel range, small holding capacity and weather exposure that can affect man and animals UNDP (1997).

Large Vehicles

The non-compactor trucks are more efficient and cost effective in small cities and in areas where waste tend to be very dense and have little potential for compaction. When these trucks are used for waste collection, they require a dumping system to easily discharge the waste. It is generally required to cover the trucks in order to avoid the spillage on roads or rain soaking the wastes. Trucks with capacities of 10-12m^3 are suitable if distance between the disposal site and the collection area is short (UNDP, 1997).

Normally the collection crew and the driver of the vehicle work as a team. Most often the collection crew members take the job as a temporary position, while searching for another respectable job. It is not the case in developed countries. The problem in developing countries is compounded by the attitude of the SWM authorities, who think solid waste collection requires no skill and do not provide any adequate training for the collection crew. Generally, familiarity of the crew with the collection areas improves the work efficiency. The driver becomes familiar with the traffic jams, potholes, and other obstructions that he must avoid (UNDP, 1997).

Waste Disposal

Disposal is the commonest solid waste management practice. All wastes; whether residential, commercial, institutional or from any other source are collected and transported to a disposal site. It may be a landfill site, an incinerator or some other mode of disposal. In most of the third world countries, solid wastes are disposed around cities and towns along the roads, which gave rise to several problems like pollution due to smoke; water pollution due to leachate; blockage of drains and sewers due to plastics; health hazards to workers and rag picker and people living in nearby areas. Disposal sometimes consists merely of shifting the refuse from one part of town to another without

any plan for its management (Mabogunje, 1980; Ogwueleka, 2003, & 2009; Agunwamba, et al, 2003). The obvious conclusion is that Nigeria is far from having solved its domestic waste management problems.

Due to these reasons, safe disposal of solid waste is important for safeguarding public health, environment and wildlife. Safe disposal is possible only when we understand the reasons for inefficient practices. As the quantity of waste generation is enormous, the municipalities struggle to collect the waste and give less importance to disposal. They may be having insufficient funds to pay the salaries of staff, most of the municipal corporations are inefficient in managing the waste due to various reasons (UNDP, 1997).It may be due to corruption at all levels or due to lack of political will to fund the practice of solid waste management. Many government authorities give less priority to waste management and do not reserve any funds. A wide range of options are available for safe waste disposal. According to UNDP (1997) they are listed as follows:

Open Dump;

Sanitary Dump;

Composting;

Incineration;

Gasification;

Refuse Derived Fuel and

Pyrolysis.

Open Dump

In this method, the solid wastes collected from cities and towns are deposited in low lying areas usually on the outskirts of the town in most of the under developed and developing countries. Since the open dumps are usually uncovered, these attract flies, birds, insects and vermin and also emit offensive odours. This method is unhygienic and

constitutes nuisance to the public and is prone to fire. At the same time, it causes health and pollution hazards and not suitable aesthetically. Yet this method is the easiest, and used in many urban places of most developing world because of lack of planning and funding (UNDP, 1997).

Sanitary Landfill

It is essentially an earthen pit, where the environmental risk is controlled at an appropriate and acceptable level and where, subsequent to disposal, land can be made available for other purposes. The purpose of landfilling is to bury or alter the chemical composition of the wastes so that they do not pose any threat to the environment or public health (Phillips & Corsetti, 1995). Landfills are not homogenous and are usually made up of cells in which a known volume of waste is kept isolated from adjacent waste cells by a suitable barrier. Barriers between the cells are made of a layer of natural soil or clay, which checks the downward or later escape of the waste components or leachate. If properly executed, it is safer and cheaper than incineration. Appropriate liners for protection of the ground water from leachates, surface run off are integral components of environmentally sound sanitary landfill (Philips, et al., 1995). The feasibility of the land disposal of solid waste depends on factors such as type, quality, quantity and characteristics of wastes, legal aspects and soil/site characteristics (UNDP, 1997).

The microbial degradation process is the most important biological activity occurring in sanitary landfills. These activities also influence the physical and chemical changes in the waste mass, which determine the quality of leachate and the quantity of landfill gas. Assumed that landfills mostly receive organic wastes, microbial process will dominate the stabilisation of waste. Soon after disposal, the predominant part of waste becomes anaerobic and the anaerobic bacteria will start degrading the solid organic carbon, eventually to produce carbon dioxide and methane. The solid and dissolved

organic compounds are hydrolysed and decomposed by the fermenters, primarily to volatile fatty acids, alcohols, hydrogen and carbon dioxide. An acid genic group of bacteria converts the products of the first stage to acetic acid, hydrogen and carbon dioxide. The methenogenic bacteria convert acetic acid to methane and carbon dioxide. Hydrogenophilic bacteria transform hydrogen and carbon dioxide to methane, (UNDP, 1997).

Landfill

Landfill is currently the most common method of disposing waste in many developed countries. It accounts for the bulk of waste disposal in the UK (90%). At its most basic, this involves digging a hole in the ground and filling it with rubbish. The site is usually too busy with different types of waste in the same landfill site (World Bank, 1999; World Health Organisation, 2005). Usually, domestic waste is disposed of with industrial waste; the latter serves to reduce the concentrations of components leached from the former-diluting the industrial leachate. In particular, domestic refuse can serve to neutralise acid wastes which arise in considerable amounts in many countries including Nigeria (World Bank, 1995 & 1996).For many years; a well-run landfill could be an inexpensive solution to garbage disposal. Some local landfill authorities have found it difficult to locate nearby landfill areas, because of political opposition from landowners concerned about lowered property prices. This definitively is not the case with Nigeria (Onibokun & Kumuyi, 1999); the Land Use Regime makes it very easy for government to obtain land for this purpose.

Three types of landfills are in practice:

Trench method: This method involves excavation of trench into which waste is deposited and covered with a layer of soil

Area method: Waste may be deposited in layers and so form terraces over the available area. In this type of operation, excessive leachate generation may occur and is difficult to control.

Cell method: This method involves the deposition of waste within pre-constructed bonded area. It is the preferred method in industries, since it encourages the concept of progressive filling and restoration. Operating a cellular method of fill enables wastes to be deposited in a tidy manner since the cell serve conceals the tipping and traps most of the litter, which may be generated. In all the above, at the end of each working day, all the exposed surfaces including the flanks and working space are covered with a suitable inert material to a depth of about 15 cm. This daily covering is essential, as it minimises the windblown litter and also reduces the odours. Domestic waste, sometimes, human excreta, is usually emptied into gutters (UNDP, 1997).

Where waste bins are provided, their contents are not regularly nor promptly removed and cleared thus spilling on streets and roads. When cleared, it is transported in open vehicles through residential and busy commercial areas, with the wind blowing them in all directions. This often results in waste dispersal and not disposal (UNDP, 1997).

Incineration

The other major method of waste disposal is incineration. This means burning waste in an incinerator. In many areas of Japan, France, Germany, Italy and Scotland, such low value recyclable waste (mostly paper and plastics) are incinerated. The reality is that a lot of domestic waste in these forms that is, paper and plastics (packaging waste) is a major contributor to the waste stream and to the problem of litter. Incineration could reduce the domestic waste volume by 95 per cent (UNDP, 1997). When waste is burnt, there are two consequences: gases will be emitted into the air and residues in the form of ash and sludge will be left behind (UNDP, 1997).

New Methods of Waste Disposal

Added to the above methods of waste disposal is a new technology for domestic waste collection called Pneumatic Collection System for Domestic Waste. This system conveys waste without the need for trucks driving through towns and is operational hours per day, every day of the year. The system is especially suited to the development of new urban areas and for renovation of historic centres (World Bank, 2003). Pneumatic collection is a break away from conventional forms of collection in that it avoids the need to place waste on the public highway and does away with movement of trucks and all the system contributes to protection of the environment by creating cleaner urban areas that function better and are more environmentally friendly. It is an innovative service with a simple operating principle. Users deposit their waste boxes on the streets or in the garbage disposal areas of residential buildings and hotels. Each box has an associated "waste value" allowing intermediate storage before transportation of the bags to a central collection point. The bags are then dropped automatically into tanks where the waste is compacted. The air needed to propel the bags is provided by high-power blowers and the system is entirely controlled from a computerised cock pit.

Access to the dropped boxes is available at any time, every day of the year and without restriction. Pneumatic collection has many economic advantages (World Bank, 2003): designed to last for 50 years, the installation and operating costs are optimised by a high level of automation and energy-efficient processes.

2.1.7 Solid Waste Management Behaviour in Nigeria: Issues and Prospect

Nigeria is located in Western Africa on the Gulf of Guinea. The country shares borders with the Republic of Benin in the Western, Chad and Cameroon Republics in the East, and Niger Republic in the north and has a coastline of about 853 km in the South. Nigeria is a region of contrast: She has varied landscape, from the Obudu Hills in the

southeast through the eastern highlands in the east, Yoruba ranges in the Western to the Hausa Highland in the north. The vegetation also ranges from mangrove swamp forest in the south through the High rain forest and the savannah in the north. Sahel Savannah is the vegetation type in the extreme north. The country is drained by rivers Niger and Benue and their tributaries. The two rivers converge into a confluence at Lokoja and empty into the Niger Delta, the world's largest river delta. The climate is characterised by two main seasons: dry and wet. 33.02 per cent of the land is arable (Obioh & Fagbenle, 2009). She is a developing country, with a land area of 923,768 km^2 and a population of about 140 million with growth rate of 2.38. She is the most populous country in Africa and ninth most populous country in the world with population distributed at 48.3 per cent urban and 57.7 per cent rural; and population density at 139 people per square km (Ogwueleka, 2009). The country has GDP per capita of $1,800 and population below poverty line is 60 per cent. She has a labour force of 50.13 million.

The country comprises 36 states and one Federal Capital Territory, which were further subdivided, into 774 local government areas. Life expectancy is 47 years (average male/female). The government provides education free at primary school level. 68 per cent of the population is literate and the rate of men (75.7%) is higher than for women (60.9%) (Igbinomwanhia & Olanipekun, 2009).

Waste management is a problem in the cities of the country. Many cities like Lagos, Ibadan, Kano and Enugu are largely characterised by poorly controlled and illegal roadside dumping of wastes (Omoleke, 2003). Such dumping degrades aesthetic quality, pollutes soil and water resources and is a potential health hazard to the urban dwellers (Omoleke, 2003). The Nigerian Environment and Study/Action Team (1991) observe that:

> …in many Nigerian cities, the volume of solid wastes has overwhelmed urban administrators' capacity to plan for their collection and disposal.

> Thus, it is not uncommon to find urban streets and roads practically blocked by solid wastes. The ever increasing and improper disposal of wastes is fast becoming global issue which many urban centres in developing nations such as Nigeria find problematic due to the environmental concerns associated.

Waste management has therefore become a major issue over the years as different methods of managing waste have been applied (Defra, 2007). This is an indication that waste management is receiving significant attention and efforts to achieve efficient and effective waste management is being intensified.

In most of the cities, waste management authorities in Nigeria manage solid waste without adequate manpower and infrastructures. Besides, their waste management systems lack the ability to forecast the quantity of waste generated based on inaccurate data. The authorities appear to be incapable of coping with the mountain load of waste generated and heaped on land. In order to address the environmental problems, the Federal Government of Nigeria introduced the following measures: the monthly national sanitation exercise in 1984; the creation of the Federal Environmental Protection Agency (FEPA) under Decree No. 59 of 1988; formulation of the National Guidelines and Standards for Environmental Pollution Control in 1992 and the creation of the Federal Ministry of Environment in 2000. FEPA (1988) established a nation-wide system of environmental management and monitoring based on State Environmental Protection Agencies. They are to serve as a regulatory body charged with the responsibility of managing solid and liquid wastes in their respective states. Recently, weekly environmental sanitation exercise is being introduced and enforced in most markets of cities and towns of federation. The objective is primarily to rid the markets of wastes. To date, attempts to address solid waste management in various cities in Nigeria have failed to incorporate urban planners. According to Mabogunje (1988), it points to the poor attention to planning in most of the cities. Studies have argued that any attempt towards

an environmentally sound waste management must be rooted in cooperation with urban planners who play a key role in making "the urban environment in Nigeria generally safe, clean, healthy and aesthetically pleasing for all the urban residents" (National Urban Development Policy, 2006). Mabogunje (1980) observes that ineffective solid waste management is caused by the poor attention being paid to physical planning in most Nigerian cities, the relics of pre-industrial urbanisation in these cities such as narrow, irregular and unploughed lanes and small streets hamper the efficient collection and disposal of solid wastes in the cities.

According to Nze (1977), several factors like inadequate infrastructure, weak environmental administration, lop-sided planning structure, are responsible for ineffective waste management services in Nigerian urban areas. For instance, about 83 per cent of population in Nigerian cities dump refuses illegally in their neighbourhoods due to inadequate street or compound wastes bins, thereby creating unsanitary condition (Benneh, et al, 1993). Karanja (2005) asserts that land use patterns in most cities of developing countries have remained a major bottleneck to effective solid waste management. In other words, space development was unplanned and had with time, grown into slums, with inaccessible roads and streets. With the example of Ibadan, Filani & Abumere (1986) reckon that solid waste management is not handled in a comprehensive manner because vital issues such as health and aesthetic character, culture of hygiene and cleanliness and environmental awareness are relegated to the background.

Most developing countries, Nigeria inclusive, have solid waste management problems different from those found in industrialised countries in areas of composition, density, political, and economic framework, quantity, access to waste for collection, awareness and attitude. The wastes are heavier, wetter and more corrosive in developing cities than developed cities (Atienza, 2007).

In developing countries, local authorities spend 77-95 per cent of their revenue on collection and the balance on disposal (Ogwueleka, 2003), but can only collect about 50 to 70 per cent of municipal solid waste (MSW). In the past, the focus has been on the technical aspects of different means of collection and disposal (World Bank, 1992), but recently, attention has been on enhancing institutional arrangement to service delivery, with emphasis on privatisation (Cointreau, 1994). Nigeria is presently experimenting with the privatisation of this sector. The Federal Government has instituted National Integrated Municipal Solid Waste Management Intervention Programme in seven cities of Nigeria. The seven cities are Maiduguri, Kano, Kaduna, Onitsha, Uyo, Ota, and Lagos (World Bank, 1999). Lagos state government established municipal solid waste management policy to encompass private sector participation in waste collection and transfer to designated landfill sites.

Ogu (2000) observes that despite the importance of adequate solid waste management to the urban environment, it remains a daunting challenge to developing countries of which Nigeria is one. NEST (1991), estimates that the annual per capita solid waste generated in Nigeria is 20 kg, which amounts to about 2 million tonnes a year if approximate annual population figure of 100 million of 1996 is used. However, 80 to 90 per cent of the waste generated is not collected for safe disposal.

Poor management of Nigeria's environment is costing the nation roughly $5 billion annually. Executive director of the Nigerian Conservation Foundation (NCF), Muhtari Aminu-Kano spoke as regards the country's environment asserting that much of the damage resulted from oil and gas extraction in the Niger Delta region. "We are losing more than $5 billion in Nigeria annually based on the way we manage our environment," he said, blaming "poor agricultural practices, oil exploration, oil spills, grazing and habitat destruction". The problem becomes compounded during the rainy season; water, does not

flow freely along the gutters, it remains stagnant, resulting in mosquitoes and vector borne diseases like malaria. It became so bad that a pragmatist approach was adopted requiring residents to spend the last Saturday morning of every month - cleaning their property; and the refuse to be placed on the streets for collection.

Legislative and Enabling Laws

The Federal Government of Nigeria has promulgated various laws and regulations to safeguard the environment. These include Federal Environmental Protection Agency Act of 1988. The Federal Ministry of Environment administers and enforces environmental laws in Nigeria. It took over this function in 1999 from the Federal Environmental Protection Agency (FEPA), which was created under the FEPA Act.

Pursuant to the FEPA Act, each state and local government in the country set up its own environmental protection body for the protection and improvement of the environment within its jurisdiction. Municipal solid waste management is a major responsibility of state and local government environmental agencies. The agencies are charged with the responsibility of handling, employing and disposing solid waste generated. The state agencies generate fund from subvention from state governments and internally generated revenue through sanitary levy and stringent regulations with heavy penalties for offenders of illegal dumping and littering of refuse along streets (Ogwueleka, 2003; Agunwamba, et al, 2003).

Laudable provisions exist in local legislations for environmental protection. All states have environmental sanitation laws or edicts which ought to enable proper disposal of domestic waste (Lagos State Waste Disposal Board, 2005). For instance in Lagos, the Environmental Sanitation Edict mandates every landlord or occupier of a house to keep free and clear drains, gutters, clear the street of all rubbish or refuse of any sort, to provide trash cans and generally prohibited any indiscriminate disposal of refuse into such gutters

and channels. An improvement on this law classified waste into domestic and commercial. It prohibited the burning of the commercial waste and the dumping of waste at sites other than design at ones. Two years later, the Environmental Sanitation Edict empowered the Waste Disposal Board to designate proper refuse disposal sites for the deposit of refuse or waste and prohibited the burning of refuse collected in garbage cans at designated sites. (The prohibition on burning was to forestall destructive fire outbreaks and reduce the emission of greenhouse gas to the atmosphere). It also authorised the board to register interested persons as private collectors. Jurisdiction to try offences under these edicts is vested on customary courts.

Domestic waste management has become an area of major concern in Nigeria today. It appears to be a lost battle against the harmful consequences of unguided waste and the attainment of a clean healthy environment for all Nigerians. He further states that the common sight in Nigeria today is to see heaps / accumulation of festering waste dumps in urban and commercial cities. All sides of residential apartments, the drains, the highways, corners of major and minor streets, undeveloped plots of land have all become waste dumps for many households. As some writers put it, waste increases in a geometrical progression and collection and disposal is at an arithmetical progression (Onibokun & Kumuyi, 1999).It does not appear to be a problem of absence of legislative framework for domestic waste management. Other factors have been identified as being responsible for penetrating the crises experienced in the management of domestic waste in Nigeria (Lawal, 2010).

Lack of Adequate Funding and Excessive Population

Waste management is by nature capital and labour intensive. This requires huge capital outlay. Many state governments spend a good percentage of their funds on domestic waste management. For example, Lagos State Government spends between 20

and 25 per cent of its funds on waste management (Lagos State Waste Management Board, 2004), what this amount could accomplish is dwarfed by the population it caters for. The state has a projected population of 12 to18 million persons. It is estimated that the average individual in such mega cities as Lagos generates an average of 0.15kg of waste daily. It is noted that the funds available or at least earmarked for domestic waste management are grossly inadequate to fund the public agencies and other private sector participants (PSP) involved in collection and disposal of domestic waste and to fund the procurement of equipment and materials required for effective domestic waste disposal (Lagos State Waste Management Board, 2004; Olanrewaju & Ilemobola, 2009).

Lack of Trained / Professional Waste Managers

There are just a few sanitation and environment engineers in Nigeria. In fact most private sector operators in waste management are mainly party stalwart who know little or nothing about waste management (Onibokun & Kumuyi, 1999; Federal Environmental Protection Agency, 1999; Olanrewaju & Ilemobola, 2009).

Lack of Effective Monitoring and Control

The waste regime in the UK provides a quintessence of a system that makes for effective monitoring of domestic waste prior to disposal and the steps to be taken on disposal. The regime distinguishes between controlled and special waste. Under section 30 of the EPA, 1990, waste authorities in charge of waste administration have three basic functions: regulation, collection and disposal. Waste disposal authorities are toward waste disposal contracts through competitive tendering and are to make contracts with waste disposal contractors who may be private sector companies or companies set up by the local authority which must be at arm's length from the waste management authority. The Waste regulation authority is responsible for issuing a waste management license (U.K Environmental Protection Agency, 1997; & Atienza, 2007).

Under the regime, controlled waste may not be deposited, treated, kept or disposed without a license. The licensing method is issued as a means of controlling waste. Section 33(1a) of the EPA provides that it is an offence to "treat, keep or dispose waste in a manner likely to cause pollution of the environment or harm to human health". "Pollution of the environment" is defined in section 29 to mean the release or escape of the waste into any medium so as to cause harm to man or any other living organism supported by the environment. "Harm" is further defined to mean "impairment to the health of living organisms or other interference with the ecological systems of which they form part and in the case of man, it includes offence to any of his sense or harm to his property". Thus the offensive smell of a waste tip would be covered; as presumably would its unattractive appearance. The offence can be committed whether or not the offender has a license. So the offence focuses on environmental protection, not with enforcing the licensing regime (EPA, 1997). This unbroken chain of waste transmission ensures indiscriminate dumping and disposal is eliminated. The waste management regime in Nigeria is far from what is described above, the house-holder-producer of domestic waste is not deterred by any form of sanctions, because mostly, waste management agencies or contractors hardly exist in many places in Nigeria nor is monitoring and monitoring authorities effective (Federal Environmental Protection Agency ,1999).

Peculiarity of the Nigerians' Attitude

Onibokun & Kumuyi (1999) assert that the "government-does-everything" philosophy of many Nigerians contributes to domestic waste management problems. A careless attitude permeates the thinking especially, of those living in cities and towns. Self-help methods of domestic waste disposal are available and could be explored by individuals and institutions. Domestic incineration, landfill system is practicable, but most Nigerian's would take to the easy way of depositing waste along highways and corners of

street for “government” to pick up. Some have founded this attitude on illiteracy but this would be a fallacy (Ogwueleke, 2003 & 2009). According to him traditionally, as is still apparent in some of our villages, where a good number of individuals are still illiterate, residents are very conscious of the importance of having a clean environment and this is evidenced by the sanitation arrangements in force in these societies.

2.1.8 Empirical Review of Related Studies

Tamas, Tobias, Caballero, & Miranda (2009) examine factors influencing people's intention like attitude, social norm and perceived behavioural control of attitude towards waste management using data from 350 households. They conclude that all the psycho-social factors influence waste behavioural intention. However, influence patterns are different for different types of behaviour. Their interventions specifically targeted at the various determinants of behaviours were developed.

Tucker & Smith (1999) have recently developed an integrated model of households’ solid waste management behaviour that simulates cause-effect links between individual household attitudes, perceptions and behaviours and the scheme-wide waste management performance indicators that are of concern to the waste management professionals. The model simultaneously considers all waste management activities within an integrated system, from source reduction activities, through home composting to kerbside and drop-off recycling. The model was developed to provide decision support to the waste management professional, to assist in making the necessary planning and management decisions, and to allow these decisions be made more objectively and with less risk, implicitly building the 'people factor' more into the decision making process. In the model, the waste management simulation is effected through the development of artificial societies of households. Each society comprises an assemblage of individual households, of given demographics, who are allowed to behave individually or respond

coherently to stimuli such as management interventions (Tucker, 1999), or to interact with each other through normative influences (Tucker & Smith 1999).

Swamia, Chamorro-Premuzicc, Snelgara, & Furnhamd (2011) examine the influence of personality and socio-demographic factors as predictors of waste management behaviours. The results of the structural equation modelling showed that individuals who were less Machiavellian, less politically cynical, older and more conscientious were more likely to report positive waste management behaviours. Waste management behaviour was related to individual psychological differences.

Mbeng, Probert, Phillips & Fairweather (2009) researched into household waste and the environmental and public health problem, improper management of household waste in Cameroon was linked to the systematic failure of policy makers and municipal authorities to identify the best sustainable ways of dealing with it in such a manner that is in line with their socio-economic aspirations. Their study found different trends in behaviour in the management of household waste, whereas psycho-social factors influenced the waste management behaviour among urban dwellers in Douala, Cameroon.

Barr, et al (2001) research into individual waste management and focused primarily on recycling behaviour. It is argued that there is the need for a focus on reuse and reduction of waste. The diversity of waste behaviour and its antecedents is therefore emphasised. The declared reduction, reuse and recycling behaviour of 673 households in Exeter, Devon is detailed. In the context of the intentions stated by respondents towards these three activities, their results demonstrated psycho-social factors determining differences in reuse and reduction of waste.

Ittiravivongs (2012) investigated factors influencing waste recycling behaviour of Thai households and examined the role of responsibility as a moderator. The results of logistic regression analysis of 381 random samples in Bangkok indicated that attitude

toward recycling, subjective norm of engaging communities, awareness of recycling benefit, perceived facility condition; perceived recycling skill and degree of responsibility significantly influence household recycling intention. The moderating effects of responsibility were found on economic incentive and perceived recycling facility condition. Higher responsibility level tends to weaken the impacts of economic incentive and perceived facility condition on willingness to recycle household waste. The results from the logistic regression analysis supported the theory of planned behaviour as attitude toward recycling, external subjective norm and perceived beliefs of difficulty in completing recycling (perceived facility condition and perceived recycling skill) significantly explained intention to recycle. In addition, the study verified that recycling tends to be an altruism behaviour as recycling intention appeared to be shaped by awareness of the need and household responsibility. The degree of responsibility provided direct effect on recycling intention and moderated the impacts of economic incentive and facility condition on willingness to recycle of household waste.

Ojedokun (2009) investigated the mediatory role of attitude towards littering in the relationship between self-monitoring and responsible environmental behaviour among a sample of residents of Ibadan city, Oyo State, Nigeria. Data was gathered from 1,360 participants using measures of self-monitoring, attitude towards littering and responsible environmental behaviour. Findings of their study revealed that there is a negative influence of self-monitoring on attitude towards littering, but no significant influence on responsible environmental behaviour; in addition, attitude towards littering had a negative influence on responsible environmental behaviour.

Jayashree, Marthandan, & Malarvizhi (2011) studied the impact of education, promotion, knowledge, awareness and reference group on the intention to minimise waste which will lead to a changed behaviour of individuals on waste minimisation in Malaysia.

A sample of 300 households from all nine districts of Selangor State was selected and the questionnaire will be used as the main tool of data collection. Education, promotion, knowledge, awareness and reference group have impact intention to minimise waste.

Taylor & Todd (1997) compare three models of waste management behaviour: a theory of reasoned action model; an environmental belief-behaviour model and an integrated waste management model which is based on the theory of planned behaviour. Using data from a sample of over 1,400 individual respondents who each completed a survey and a 2-week diary of their consumer composting activities, overall, their results revealed that while the environmental beliefs- behaviour model and the integrated waste management models fit the data well, the integrated waste management model provided better predictive power and offers significant insight into the factors that influence composting behaviour.

Bezzina, & Dimech, (2011) explore different factors of recycling behaviour with evidence from Malta in order to determine which of these factors emerge as significant predictors of the recycling participation of Maltese residents. The result shows that nine factors – personal recycling attitudes, norms and skills, satisfaction with service provided, inconveniences, awareness of consequences, knowledge of issues, social recycling attitudes and norms, motivating factors, intentions to act and scheme preference – account for 68.5 per cent of the variability in the recycling behaviour of Maltese residents. Additionally, the first three factors highlighted above emerged as significant predictors of recycling participation and together, accounted for 48.5 per cent of the variability in recycling participation. In the light of the findings, the issue of adopting a corporate communications programme emerges as a possible strategy aimed at putting mandatory European Union (EU) recycling targets for Malta back on track. The Model of Altruistic Behaviour as well as other additional variables (e.g. situational factors and demographic

factors) makes significant contribution to the understanding of the recycling behaviour and the recycling participation of Maltese residents

Nils & Sterner (1999) analysed waste disposal, recycling and composting in a municipality in South Western Sweden. This makes it possible to carry out a more reliable and more detailed analysis than has been previously possible, particularly with respect to attitudinal variables. The most important determinants of each individual household's waste were composting of kitchen waste, living area, age and attitudes concerning the difficulty of recycling various materials. Separate sections look at composting behaviour, willingness to pay for sound waste management and for the sake of comparison three other municipalities were also studied. The main finding is that economic incentives, although important, are not the only driving force behind the observed reduction in municipal waste.

Black, et al (1985) observe that attitudes predicted low-cost residential energy improvements but not high-cost ones. While behaviourists avoid reference to attitudes, and perceive them to be relatively superfluous when it comes to behaviour change, their research suggests that recycling programmes which offer curb pickup, drop sites in proximity to residents, and containers which make it easy to separate different kinds of recyclables, should all increase recycling. Reid, Luyben, Rawers, & Bailey (1976) observe proximity of containers to increase newspaper recycling in apartment complexes. Humphrey, Bord, Hammond, & Mann (1977) observe that office workers provided with wastebaskets divided for recyclables and non-recyclables reported more responsible environmental waste management behaviour than workers with two separate wastebaskets or those with one wastebasket for recyclables and a centrally located receptacle for other trash.

2.2 Theoretical Framework

Many psycho-social theories, models and frameworks have been applied in evaluating and predicting environmental behaviour (Montada et al., 2007; Wall et al., 2007; Van Birgelen et al., 2009). Most theories proposed for understanding, predicting and changing human behaviour recognise the importance of a person's disposition, environmental norm and context factors necessary for producing any behaviour (Fishbein et al., 2001; Gielen & Sleet, 2003). Perhaps the most frequently applied and empirically proven theory in environmental behavioural research is theory of planned behaviour. This includes theory of reasoned action, responsible environmental theory, value belief model of environmental behaviour and sense-of-place theory. Considered most appropriate and relevant to this study is reasoned action theory which gives credence to the government activities and psycho-social factors as important variables in waste management behaviour outcome.

2.2.1 Theory of Reasoned Action

Theory of Reasoned Action (TRA) and Theory of Planned Behaviour (TPB) (Ajzen & Fishbein, 1980) were used in this study as a framework in understanding, explaining and predicting behaviour. The theories assume that individual behavioural intentions are directly associated with their attitudes. The theory of reasoned action views an individual's intention to perform or not to perform as an immediate determinant of the action. This behavioural intention has two determinant; attitude towards the behaviour and the subjective norms. The beliefs related on attitude towards the behaviour are called behavioural beliefs whilst normative beliefs are for the subjective norms. The theory of planned behaviour holds the view that an individual's determination is influenced by government activities and psycho-social factors. Thus, it is best to examine human behaviour when participation decisions are voluntary and under an individual control.

Therefore, this theory is suitable to predict and understand urban dwellers behaviour in relation to solid waste management.

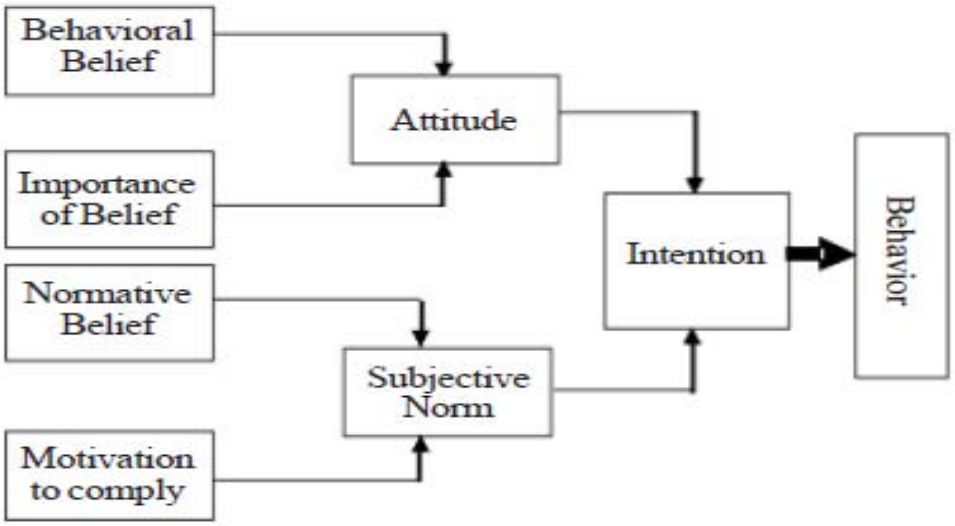


Figure 2.1: Theory of Reasoned Action

Source: Adapted from Ajzen, (1991).

The Theory of Reasoned Action identifies two conceptually independent determinants of intention. The first is a personal factor called attitude and refers to the degree to which a person has a positive or negative evaluation of the specific behaviour in question. If a person perceives that behaviour is positive, she will have a positive attitude toward that behaviour. The opposite can also be stated if the behaviour is thought to be negative (See Fig.2.1). The second is intention; if individual's intention is socially and environmental reinforced by significant orders in the social milieu, the intended behaviour is more likely to be achieved with a positive attitude. This puts intention in a powerful position, because of its strong relationship to behaviour, many studies that use the Theory of Reasoned Action, measure behavioural intention and forego the more difficult measurement of behaviour. In this study, it was possible to measure behaviour directly and thus there was no need to use intention as a proxy for behaviour (See Figure 2.1).

Cognitive and personality variables were perceived as the main drivers of the intention to act which in accordance to the psychological approach of the Theory of Reasoned Action (Ajzen & Fishbein, 1980) is the most direct determinant of behaviour. A review of the empirical literature suggests that although the Theory of Reasoned Action has been utilised successfully to analyse various types of behaviour, it has received limited and differing attention in environmental management (Vining & Ebreo, 2002) and waste reduction (Bagozzi & Dabholkar, 1994).

The theory of reasoned action provides an account of the way in which Attitude, Norms and Intentions combine to predict Behaviour. A glimpse at the conceptual and empirical literature reveals that the Theory of Reasoned Action appears to have a unifying power in the sense that it fits well with knowledge that has already been learned and integrates it into a few constructs. This implies that one should understand the social, economic and cultural contexts in which people are likely to behave and manage their wastes. The theory suggests that enacting responsible solid waste management behaviour is the function of an individual's perception about the behaviour and social norms surrounding the attitude towards performing the act. The situation is such that when stakeholders display non-challant attitude and negative perceptions of acting responsibly, people choose to dump waste indiscriminately because the government and policy makers are careless about issues of waste minimisation, recycling and reuse and makes the movement of waste to dump sites as paramount, caring less about what happens to the waste. The residents also endeavour to emulate the government by only shifting the waste from one place to another outside their immediate environment and bothered about the impact of the waste. Thus, to encourage responsible waste management behaviour, the government, the stakeholders and the urban dwellers must be responsible towards their environment and feel positively in doing so.

Despite the number of research and literature on wastes, a number of interesting findings are emerging that attitudes toward waste management and subjective norms over waste disposal and management have all been found to be related to respondents' intentions to pro environmental waste behaviour. Thus, there is an increasing realisation that application of the Theory of Reasoned Action in the environmental arena introduces a level of complication, because the benefits to be derived from behaviour change are derived by the community as a whole rather than the individual making the change, thus providing less motivation for individual change despite the predictive success of the theory.

2.2.2 Constructing a Waste Management Behaviour Model for the Study

Stern, (1995) developed a theoretical model of environmental behaviour that serves as a useful framework for identifying government, psychological and social factors influencing wastes management behaviour (Stern, et al, 1995; & Stern, 2000). As Stern (2000) notes, the attitude-behaviour relationship is strongest when contextual factors that make such behaviour practicable are constant when context is strongly in favour of or opposed to the behaviour. Favourable attitudes about waste minimisation are unlikely to promote good waste management behaviour if waste bins and dumping sites are unavailable, easy to access and recycling inexpensive.

These researchers have come to realise that attitude and decision to act responsibly, state policy and provision of infrastructure and socio-cultural circumstance are factors majorly responsible for poor waste management behaviour worldwide. For the Nigeria situation, all the three factors have been identified to put responsible environmental behaviour at risk. Several interventions outside empirical based research have often targeted attitude and enforcement of environmental laws. But unfortunately, such efforts have met with only limited success, that is, past governmental laws and

regulations such as War Against Indiscipline (WAI), Keep Nigeria Clean (KNC), Kick Against Indiscipline (KAI), Clean up and Green Up and other various attempt at maintaining good disposal habit and proper waste management have largely not been able to change the waste management behaviour of people in the South-Western cities of Nigeria (Omoleke, 2004; & Agwamba, 1998).

A reason to note is that such efforts were created in the absence of how psycho-social factors which include social norms, cultural practices, individual perception of waste management and specific action plans affects waste management practice. Also, these interventions neglect the role of contextual factors such as the availability of transport services and waste management regulations in the community (Olli, Eero, Gunner, Grendstad & Dagwollebaek, 2001).

The formation of stable, long-term attitudes that motivate responsible waste management behaviour requires a sound psychological disposition and environmental knowledge base. Theories like Reasoned Action, Planned Behaviour have linked human attitude and decision to act as the central factor in waste management behaviour. These theories suggest that attitude and personal disposition play significant roles in attitude change and responsible waste management behaviour. Recent postulation and empirical studies have shown that waste management behaviour is not devoid of context and governmental policies.

A limitation to the past studies is that they have narrowly studied the range of waste management problem behaviour determinants from singular approach than from combining governmental activities and psycho-social factors in a single study. By using a singular approach, researchers and practitioners might be prevented from seeing the complex nature of attitude towards waste management through a governmental lens. The functioning of solid waste management systems is influenced by the waste handling

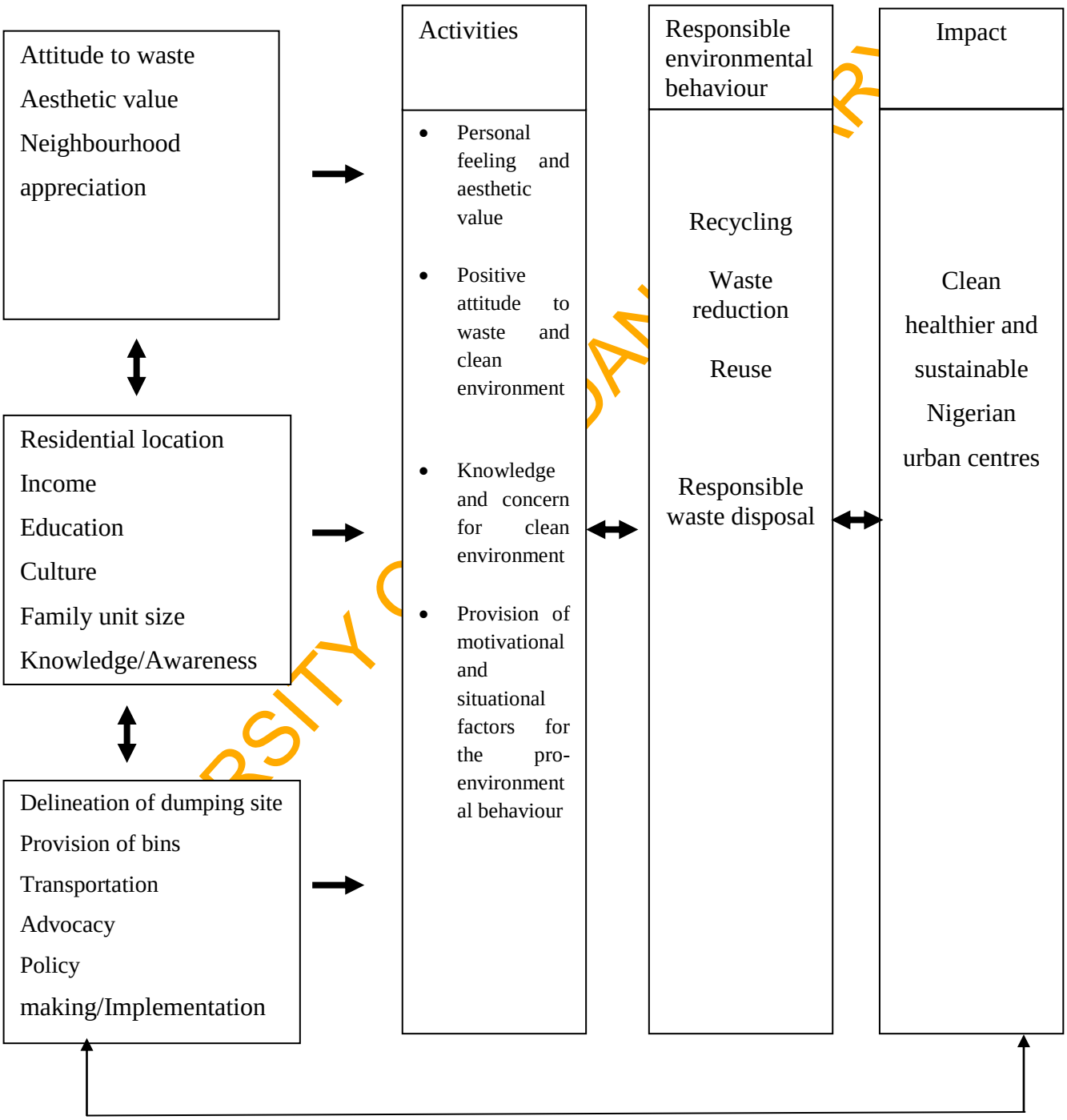
patterns and underlying attitudes of the urban population. These factors are, conditioned by the people's social and cultural context.

As such, this study converge these ideas to the point that the model may provide a clearer and more manageable psycho-social model which could explain factors responsible for responsible environmental behaviour either as a response to external socio-cultural dynamics or a psycho-social dynamics of influences serving as the major determinant of waste management behaviour. For this study, the hypothesised model is based on the premise that psycho social and government activities will directly influence solid wastes management behaviour toward a sustainable environment through:

- Personal feeling and aesthetic value;
- Positive attitude to waste and clean environment;
- Knowledge and concern for sustainable environment and
- Provision of situational motivators

And these go on to influence a positive pro-environmental behaviour (see Figure 2.2). Thus, the relationship between psycho-social determinant of wastes management behaviour and the waste management behaviour suggested will moderate and mediate the development of sound waste management behaviour and engender cleaner and sustainable environment.

Figure 2.2: Hypothesised Framework of Solid Waste Management Behaviour



2.2.3 Appraisal of Literature Reviewed

The review of literature revealed that Nigeria remained largely a country with poor waste management practices induced by myriad of socio-demographic, psychological and government activities. Meanwhile, several interventions designed to manage solid wastes did not yield the desired result (Omoleke, 2004; Ogwueleka, 2009; & Nabegu, 2010).The literature, showed that waste management behaviour is a function of people, environment and governmental activities. Theoretically, the relationship among these variables (people, environment and governmental activities) was explained using theory of reasoned action which suggests that personal attitude as well as availability of the necessary facility will play crucial roles in the enactment of proper waste management behaviour. The empirical review of past studies showed that age, gender and socio-economic status play significant role in waste management behaviour. Also, the contribution of attitude and perception as determinants of waste management practices was identified.

Several models have been proposed regarding the determinants of waste management behaviour, observably most of the models largely neglected bringing government and psycho-social factors together in their explanation of waste management behaviour. This study expands the model adopted to include government activities and psycho-social factors in its analysis of determinant of wastes management behaviour. Based on this, it is assumed that the intended result will show that psycho-social and governmental activities generally will determine waste management behaviour of respondents in the South Western cities in Nigeria.

2.2.4 Hypotheses:

The following four null hypotheses were tested at the 0.05 level of significance:

HO_1: There is no significant correlation between each of delineation of dumping site, provision of bins and transportation facilities, environmental policy formulation/implementation, advocacies, on the part of the government and solid wastes management behaviour.

HO_2: There is no significant correlation between each attitudinal dispositions, aesthetic values, environmental/ neighbourhood appreciation and solid wastes management behaviour.

HO_3: There is no significant correlation between each of academic qualification, family/ unit size, cultural affiliation, knowledge and awareness of environmental education, income and solid wastes management behaviour.

HO_4: HO_4: There is no significant difference between the impacts of government activities and psycho-social factors on solid wastes management behaviour on the basis of households/residential, commerce/industrial, institutions and cities.

CHAPTER THREE

METHODOLOGY

3.1 Research Design

The descriptive survey research design of expo-facto type was adopted for the study. This is considered appropriate as it provides a strategy for obtaining and describing existing conditions without any manipulation of the governmental activities and psycho-social factors.

3.2 Population

The population of the study consisted inhabitants of the six urban centres selected for the purpose of the study. The population was classified into three categories on the basis of households (residential), commerce (industrial), and institutions in the state capitals of Oyo, Ogun, Osun, Ekiti, Ondo and Lagos, that is, 14,181,840.

3.3 Sample and Sampling Technique

The multistage sampling procedure was used in selecting the actual sample for the study. A combination of different sampling techniques were used to collect data/information about households/residential, commerce/industrial, and institutions. The households were selected using the multistage sampling technique. The sample size was first determined from total population using RaoSoft online sample size calculator (Raosoft Inc, 2004) (Appendix M – it is an online calculation of sample size from a main population developed by Raosoft Inc.).

The sample size for each of the city is based on their populations. The result is presented in Table 3.1.

Table 3.1: Estimated sample size for each of the city based population

State Capitals	Population	Calculated sample size	Household (scaled up)	Industrial	Institutions
Lagos	8789133	385	500	100	100
Ibadan	3565810	385	425	50	70
Osogbo	499444	384	385	40	50
Abeokuta	593140	384	385	40	50
Akure	420623	384	385	40	50
Ado-Ekiti	313690	384	385	40	50
Total	14,181,840	2,306	2,465	310	370

The average sample size across the six cities is 384; however the sample sizes of Lagos and Ibadan were scaled up to 500 and 425 respectively to cater for population variations. The second step was the designation and stratification of the population on the basis of household unit on high, medium and low density areas using stratified sampling method. At the third stage, systematic sampling technique was used to distribute the questionnaire to households. Every third house on the selected street or district was sampled in the study. For industrial/commercial and institutions, owing to the spatial dispersion and the sample size, cluster and convenience sampling techniques were used to select (e.g. wards or units) the sample of the study (i.e. element) from each group. Industrial layouts/estates and business wards constitute the clusters (Table 3.2). The parameters considered for the selection of the study sample were type of activities, scope of the business and industrial activities.

Table 3.2: Selected cluster areas in six cities

Cities	Industrial	Institutions
Lagos	Ikeja, Apapa, Oshodi and Isolo	Lagos Island/Ikoyi, Ikeja, Agege, Apapa
Ibadan	Oluyole, Challenge, Ojoo, Iwo road, Dugbe,	Yemetu, Mapo, Bodija, Agodi and Mokola
Osogbo	Ikirun Road and Ajegunle, Ife-Ipetumodu road	Oke Baale and Abere
Abeokuta	Itoosin and Oke Ilewo,	Ibara, Asero, Quarry Road and State Secretariat
Akure	Oyemekun Road and Lagos Road	Oba Adesida Road and Oyemekun Road
Ado-Ekiti	Akure Road and Industrial Layout	University of Ado Ekiti and State Secretariat

Using convenience sampling technique, 310 commercial (industrial) organisations and 370 institutions were sampled from the industrial (commercial) and administrative districts. The study made use of 2,465 respondents from household/residential, 310 from commercial/industrial, and 370 from institutions.

3.4 Instruments

The main instruments for data collection were four sets of questionnaires on the basis of household/residential (Appendix A); commercial/industrial (Appendix B); and Institutional organisation, (Appendix C).These are Government Activities Scale, Psychological and Social Factors' Scale and Solid Waste Management Behaviour Inventory Scale. These instruments were complemented with qualitative techniques of Key Informant Interviews (KII) and In-depth Interview (IDI) (Appendix N).

3.4.1 Government Activities' Scale

This contains questions on government activities such as delineation of dumping site, provision of bins and transportation facilities, environmental policy formulation/implementation and advocacies.

The instrument used to elicit information from the respondents is the Likert rating scale and few open-ended questions that sought general opinion of the respondents. The instrument was adapted from waste disposal behaviour in Jamaica questionnaire instrument developed by Post (2007). The scale achieved a reliability of 0.79 Alpha in the previous study. For validity check, the questionnaire was verified. It was pre-tested and all necessary corrections made and incorporated before administration. The reliability of the instrument was re-established using cronbach alpha and reliability coefficient of 0.73 was recorded.

3.4.2 Psychological Factors' Scale

The questionnaire was used to elicit information from the respondents on the psychological factors that influence solid waste management behaviour among residents. It contains questions on such psychological factors as attitudinal dispositions, aesthetic values and environmental/neighbourhood appreciation.

It was constructed using the four-point Likert rating scale with responses varying from Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) (Appendix A). There were a few open-ended questions that sought for general opinion of the respondents. It was adapted from pro-environmental behaviour questionnaire instruments developed by Dunlap, Riley & Michelson, (1998) and environmental behaviour scales by Steg & Vlek (2009). The scale recorded strong reliability of between 0.71 and 0.91 alpha, based on review of previous studies (Dunlap et al, 2000). The questionnaire was verified for validity, pre-tested and all necessary corrections made and

incorporated before the questionnaire was finally administered. Reliability of the instrument was re-established by the researcher using Cronbach Alpha and reliability coefficient at 0.84 was obtained.

3.4.3 Social Factors' Scale

The questionnaire was used to elicit information from the respondents on the social factors that influence solid waste management behaviour among residents of the urban centres. The questionnaire contained questions on social factors such as academic qualification, family unit/size, cultural affiliation, knowledge and awareness of environmental education and income status.

Four-point Likert rating scale and questions that sought general opinion of the respondents were employed (Appendix A).The instrument was adapted from waste disposal behaviour questionnaire instruments developed by Post (2007) in Jamaica; and environmental behaviour scales by Steg & Vlek (2009). They have high reliability (α = 0.88, α = 0.86, (Cronbach Alpha) and were verified for validity. The questionnaire was pre-tested; all necessary corrections made and incorporated before it was finally administered on the respondents. The reliability of the instrument was re- affirmed using cronbach alpha and reliability coefficient at 0.80 was recorded.

3.4.4 Solid Waste Management Behaviour Inventory

A questionnaire was used to elicit information from the respondents on solid waste management behaviour. The questionnaire contains questions on citizen's behaviour towards solid waste management, (dependent variable) and was also constructed and structured into the four-point Likert rating scale. Few open-ended questions that sought general opinion of the respondents were asked.

The instrument was adapted from waste disposal behaviour and habits instruments developed by Dunlap and Michelson (1998), Stern (2001) and Post (2007). The

instruments have been identified to be reliable from previous studies of Dunlap and Michelson (1998); Post (2007); Steg & Vlek, (2009). The validity of the questionnaire was verified, this was pre-tested and necessary modifications made before it was administered. The instrument recorded a relationship of 0.78 using cronbach alpha.

Qualitative instrument

The study also utilised the focus group discussion (FGD) and In-depth interview (IDI) to elicit information from the respondents in the six urban centres selected for the study.

In-Depth Interview (IDI):

The qualitative method of In-Depth Interview (IDI) was used as supplement to the survey method in order to ensure that information that may not be captured by the survey technique was captured through mutual interaction of the researcher with the respondents. Questionnaire alone may not serve the purpose of getting adequate information needed. A total of 9 Key Informant Interview sessions was conducted among residents, government officials and workers in industry selected from three (3) states of the Southwestern Nigeria. The study also utilizes qualitative methods of the In-Depth Interview (IDIs) to elicit information from 3 respondents in each of the urban cities in the three (3) selected urban centres.

Table 3.3: Location and In-Depth Interview (IDI)

Cities	Units	No of Participants	No of Sessions
Abeokuta	Household Commercial Institutions	1 1 1	1 1 1
Ibadan	Household Commercial Institutions	1 1 1	1 1 1
Lagos	Household Commercial Institutions	1 1 1	1 1 1

The IDI was made up of nine questions and conducted at the various urban cities after the questionnaire has been administered. The interview date was scheduled about ten days in advance. Before starting each IDI session, the study was explained to participants individually. After confirming their acceptance to take part, the IDI interview session was conducted. Each session lasted between 20 to 30 minutes. All discussions were tape-recorded, and the researcher also took notes. The in-depth interview enabled the researcher to get the various responses of the respondents, which help in finding out their real experience of waste management behaviour practices. The IDI sessions was conducted with the aid of discussion guide and tape recorder to store responses apart from note taking.

B. Focus Group Discussion (FGD).

The study also utilizes the qualitative research instrument (Focus Group Discussion) to elicit information about factors influencing waste management behaviour. This was adopted to get information in an informal atmosphere of a discussion group. Three Focus group Discussions were conducted among residents, government officials and workers in industry in the three states. Six (6) respondents each made up of Two (2) members of households, Two (2) members each from institutions and commercial units attended the

focus group discussions in the three (3) selected urban cities. Each session was attended by 3 male and 3 female respondents in each of the sessions. The FGD was made up of ten themes based on the waste management behaviour activities in the selected urban centres. The responses were tape recorded and notes were taken during the sessions.

Table 3.4: Focus Group Discussion (FGD)

Cities	Units	No of Participants	No of Sessions
Abeokuta	Household Commercial Institutions	2 2 2	1
Ibadan	Household Commercial Institutions	2 2 2	1
Lagos	Household Commercial Institutions	2 2 2	1

3.5 Key Informant Interview (KII) guides in sub themes

- Solid waste management behaviour in Nigeria – what factors will influence the decisions of waste disposal in households, industries and institutions?
- Factors affecting responsible waste management behaviour in Nigeria – What are the salient factors that can influence responsible waste management behaviour?
- Psychological factors and waste management behaviour – What are the psychological factors that may determine and/ or influence solid waste management behaviour in the cities and towns?
- Attitude towards waste and solid waste management behaviour – What are the observed attitudes of households, industries and institutions towards solid waste management behaviour?
- Neighbourhood appreciation and environmental concerns and solid waste management behaviour – An enumeration of Neighbourhood appreciation and concerns of solid waste management behaviour.
- Social factors and solid waste management behaviour – Listing of households, industries and institutions' social factors affecting solid wastes management behaviour.

- Income and alternative solid wastes management strategies – How income influences households, industrial and institutional solid wastes management behaviour.
- Knowledge and awareness of solid wastes management behaviour – The impact of levels of awareness and knowledge on solid wastes management behaviour.
- Government activities and solid wastes management behaviour – The roles of governments and its agencies in solid wastes management behaviour.
- Environmental policy formulation/implementation and solid wastes management behaviour- Existing policies and programmes and their implementations on solid waste management behaviour.
- Establishment of regulatory and monitoring bodies – Which institutions and agencies are available and responsible for solid wastes management?
- Environmental education and solid waste management - Which environmental education is on ground and its impact on households, industries and institutions for solid wastes management behaviour?

3.5 Procedure for Data Collection

The researcher obtained permissions from the Department ethical review board to carry out the study. The researcher administered the questionnaire personally to the targeted sample population with the assistance of at least ten trained research assistants. One household was sampled in every third house on the selected street or district. For industrial/commercial and institutions, owing to the spatial dispersion and the sample size, cluster and convenience sampling techniques were used to select (e.g. wards or units) the sample of the study (i.e. element) from each group. The researcher administered the questionnaires at the industrial/commercial and institution clusters using the convenience sampling technique where questionnaire were administered on available members of the commercial /industrial organisations and institutional heads. This procedure was carried out in the six urban centres in the six states.

3.6 Methods of Data Analysis

The data collected were analysed using the descriptive statistics .Frequency counts, percentages, pie and bar charts were used for the demographic information of the respondents. The inferential statistics of Pearson product moment correlations was used to analyse relationship between governmental activities and psycho-social factors (independent variables) and solid waste management behaviour (dependent variable); and multiple regressions were used to analyse the effects and level of determinant of the independent variables (government and psycho-social) on the dependent variables (solid waste management behaviour) at 0.05 level of significance.

CHAPTER FOUR

FINDINGS AND DISCUSSION

The results of the analysis and discussion are presented in this Chapter in quantitative and qualitative forms. The summary of the analysed data (findings) are presented.

4.1 Demographic Characteristics of Respondents on Household

Figure 4.1 shows average sample size across the six cities. The sample size distribution shows that Lagos has the highest recorded population, 20.28%; followed by Ibadan, 17.24%; while the sample size was equal across the remaining four cities, that is, 15.62% each. The calculated population for the six cities is 2,465. There are variations in the population and thus, the difference in the sample size for each of the cities.

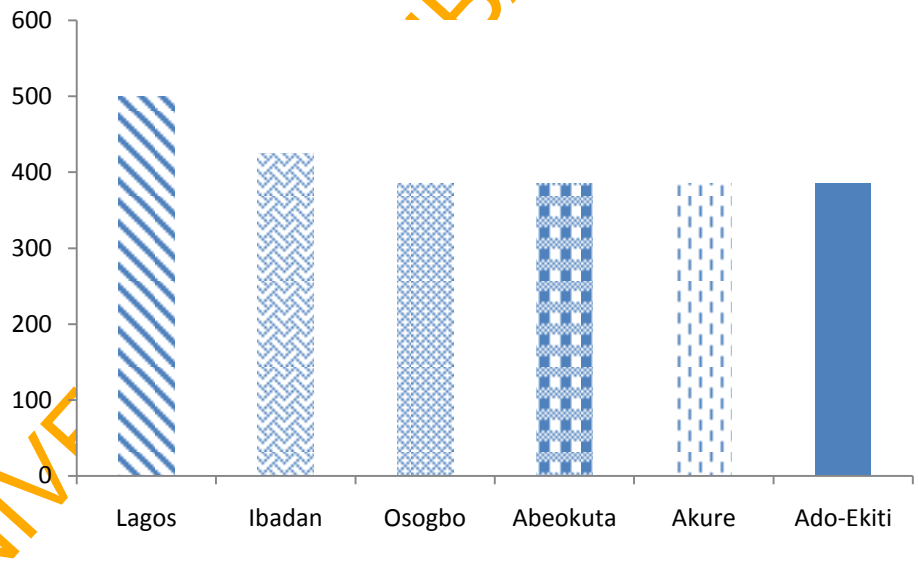


Figure 4.1: Sample Size Distribution.

Distribution of Respondent by Sex.

Distribution of respondents by sex is shown in Figure 4.2. There were more males than females: 43.0% were females while majority 57.0% were males; see Figure 4.2; distribution of respondents by sex.

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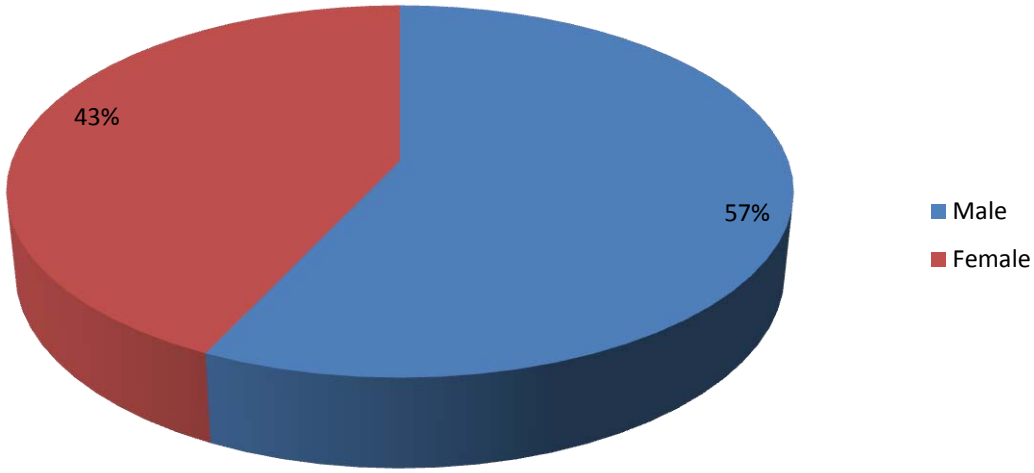

Figure 4.2: Respondents by Sex

Respondents by Age.

The age distribution revealed that 35.4% of the household respondents fall between 20 and 29 years age bracket, while the largest proportion, 42.3% were between the age bracket of 30 and 39 years; 18.9% fall between 40 and 49 years, 3.4% fall between the age bracket of 50 years and above see Figure 4.3. This demonstrates that the data collected cut across all age cohort; and largest proportion of the respondents are the active population which are more involved in waste management; this population is receptive to new ideas, awareness and education.

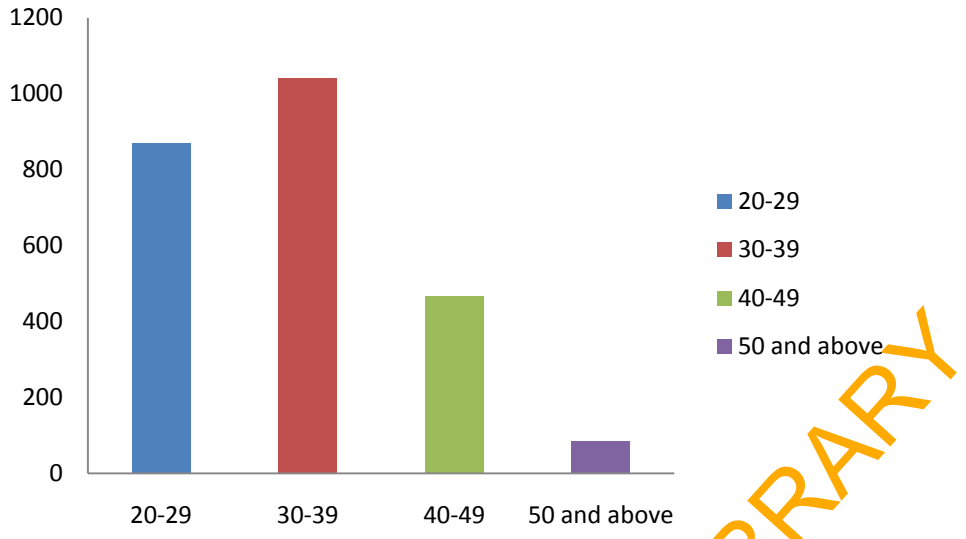

Figure 4.3: Respondents by Age.

Respondents by Marital Status.

Distribution of the respondents based on marital status is shown in Figure 4.4. 43.0% of the respondents were single, majority, 55.0% were married and 2.0% were divorced. This is necessary in order to determine the social economic demand.

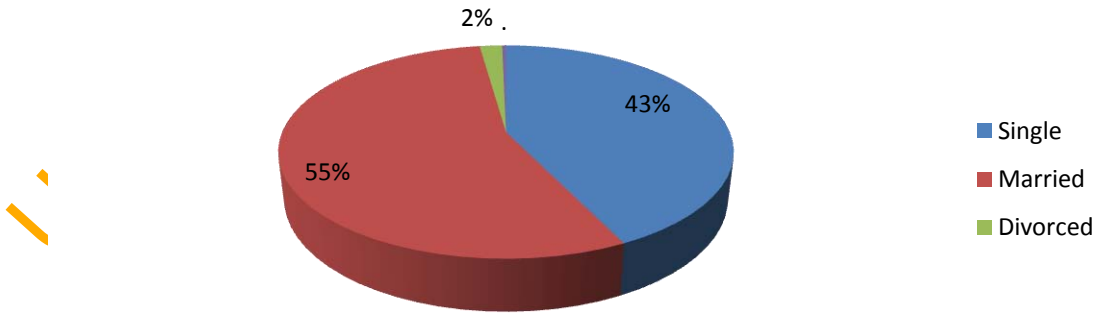

Figure 4.4: Respondents by Marital Status

Respondents by Religious Affiliation.

Figure 4.5 reveals the distribution of the respondents by religious affiliations. Largest proportion, 64.00% (1,578) were christians, 35.66% (854) were muslims and 1.34% (33) practice other religions: All religious affiliations were duly represented.

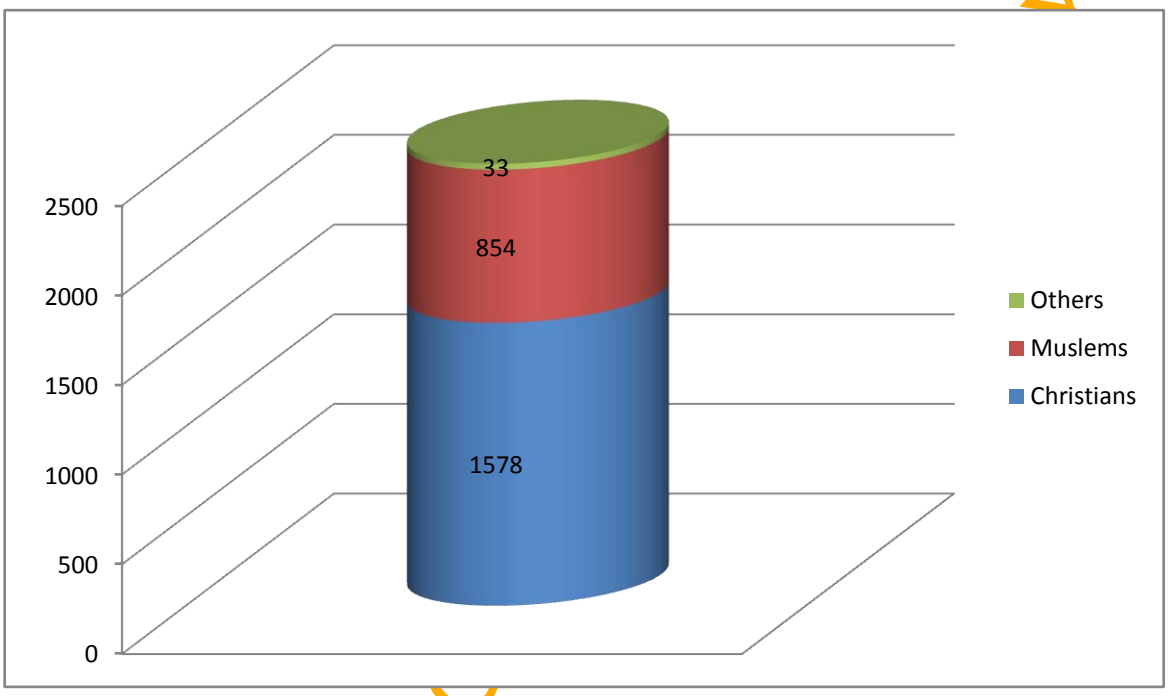

Figure 4.5: Respondents by Religious Affiliation

Respondents by Ethnicity.

Four ethnic groups were identified: Yoruba, Igbo, Hausa and others (specified). Majority, 81 per cent, were Yoruba. The proportion is this large because the research and the survey were conducted in South Western, Nigeria where Yoruba ethnic group dominates. 12.0% were Ibo, 5.0% were Hausa, and others (specified) 1.8%. (Figure 4.6) The "others" specified, include other major ethnic groups of Nigeria resident in the region and a few of other nationals.

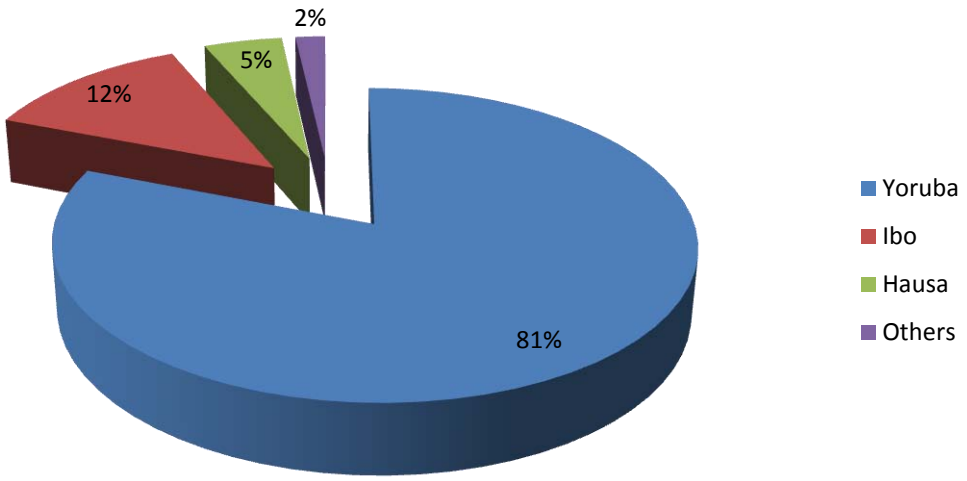

Figure 4.6: Respondents by Ethnicity

Respondents by Employment Status.

By employment status, majority 59.0%; were employed, 12.0% were unemployed, 27.0% were students/apprentices, and 2.0% were retirees (Figure 4.7) Over 60 per cent are involved in one activity or the other that leads to waste generation and thus, eligible to respond to questions on solid waste management behaviour.

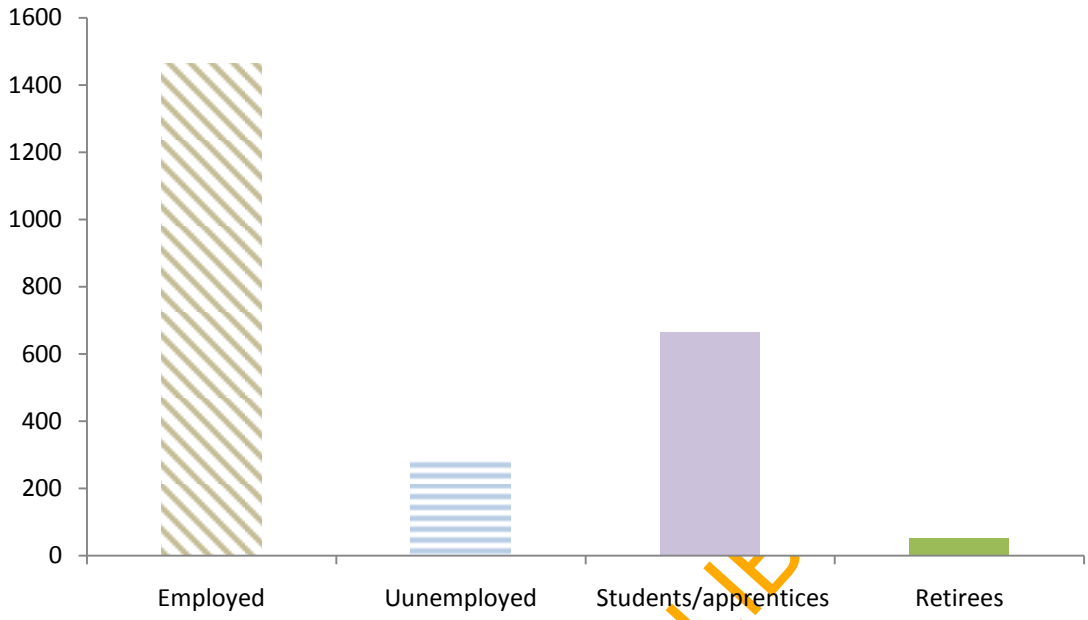

Figure 4.7: Respondents by Employment Status

Respondents by Income Status.

The distribution of respondents by income status per month is shown in Figure 4.8. 33.0% received no income, 16.0% earned less than ₦30,000, 29.0% earned between ₦30,001 and N60,000 monthly, 10.0% earned between ₦60,001 and N90,000, 5.0% earned between ₦90,001 and ₦120,000, 6.0% earned between ₦120,001 and ₦150,000, the rest 1.0%, earned above₦150,000 per month. This distribution cuts across all income groups. Majority falls within middle income group. This implies that they will be able to finance alternative waste management strategies such as paying private waste collectors, recycling and capable to afford inorganic foods that may be expensive but degradable.

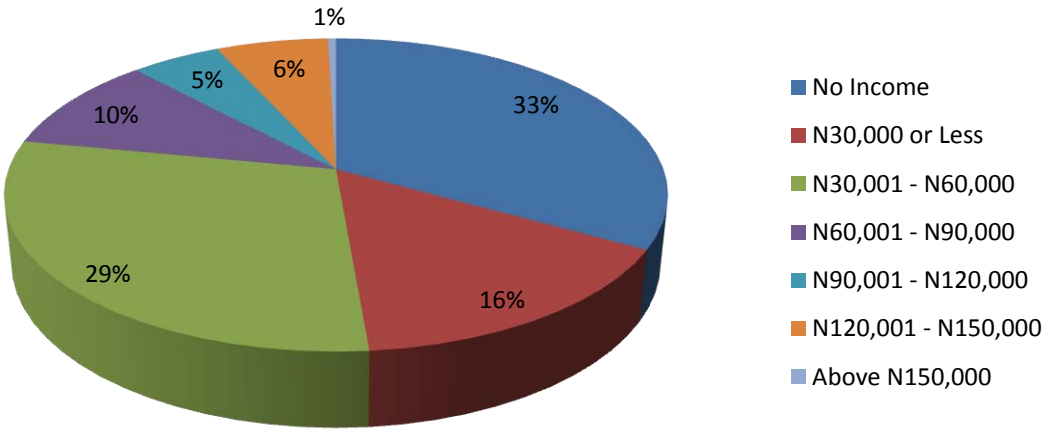

Figure 4.8: Respondents by Income Status

Respondents by Educational Qualification

The distribution of respondents based on educational qualification reveals that 5.7% had no formal education, 35.5% had secondary school education and equivalent, 6.5% had teacher training and equivalents, 18.2% had OND/NCE. 11.8% hold HND and 22.2% possess B. Sc. and post graduate certificates; (Figure 4.9). Majority of the respondents, over 80%, had basic education and might have acquired knowledge of proper waste management behaviour

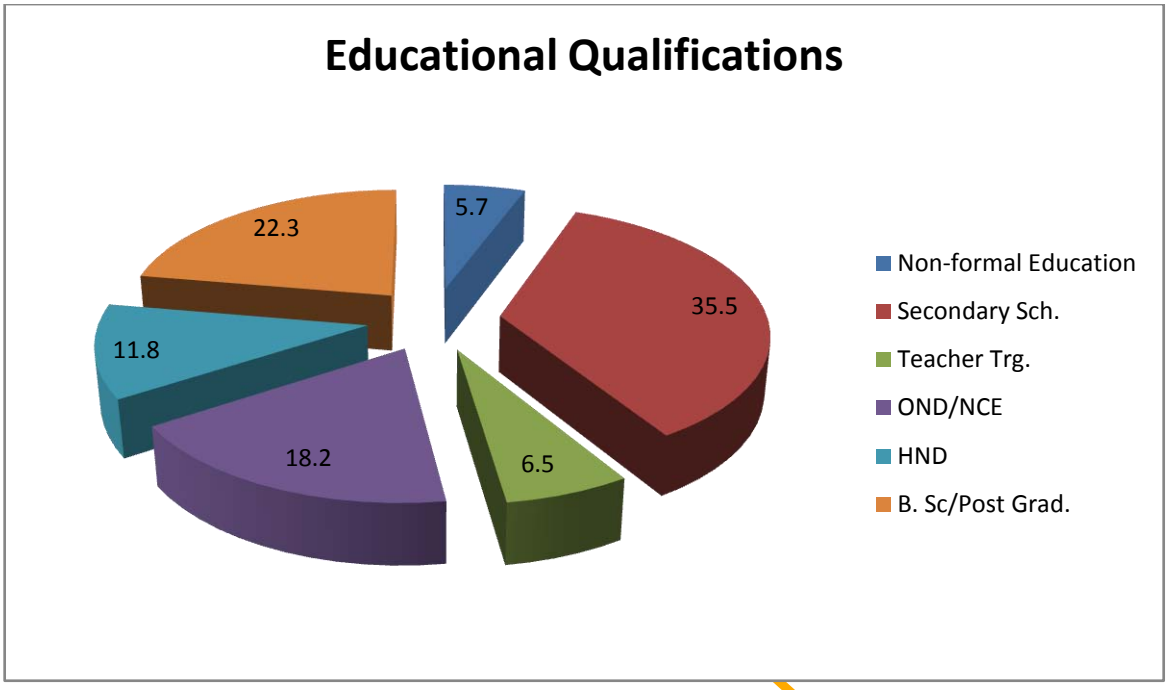

Figure 4.9: Respondents by Educational Qualification

Respondents by Family Size.

Based on respondents' family size, 41.8% recorded between 2 and 3 family size; 45.5% recorded between 4 and 6 family size; 9.6% reported between 7 and 9 family size; and 3.1% posted 9 and above (Figure 4.10).

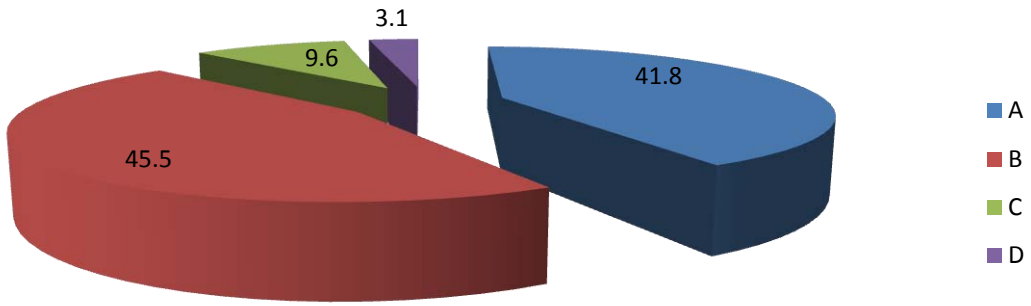

Figure 4.10: Respondents by Family Size.

4.1.2 Demographic Characteristics of Industrial Organisations

This section discusses the demographic characteristics of industrial organisations respondents vis-a-vis the organisational characteristics.

Industrial Units by Unit Size of Organisations.

The sizes of the organisations, by number of staff, revealed that 61.90% employed between 10 to 250 people. Thirty point three per cent employed between 251 and 500 persons; 5.1% had between 501 and 750 staff; and 2.7% employed over 750 people (Figure 4.11). In other words, 92.20 per cent of organisations employed between less than 250 and 500 persons.

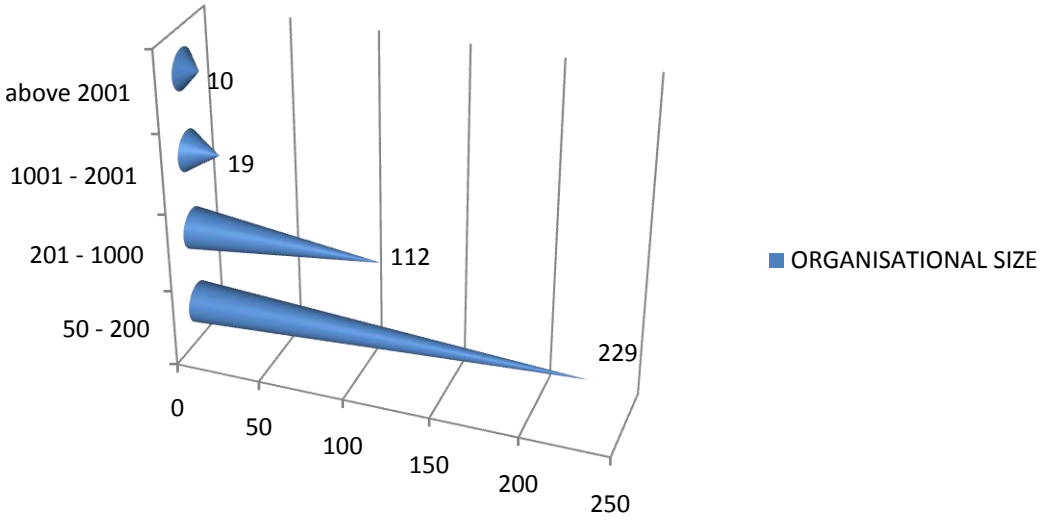

Figure 4.11: Industrial Units by Size.

Industrial Units by Ownership of Organisations

Two hundred and sixteen, that is, 58.00% of the organisations were owned by government; while the rest, 42.0% were owned by private individuals and groups (Figure 4.12).

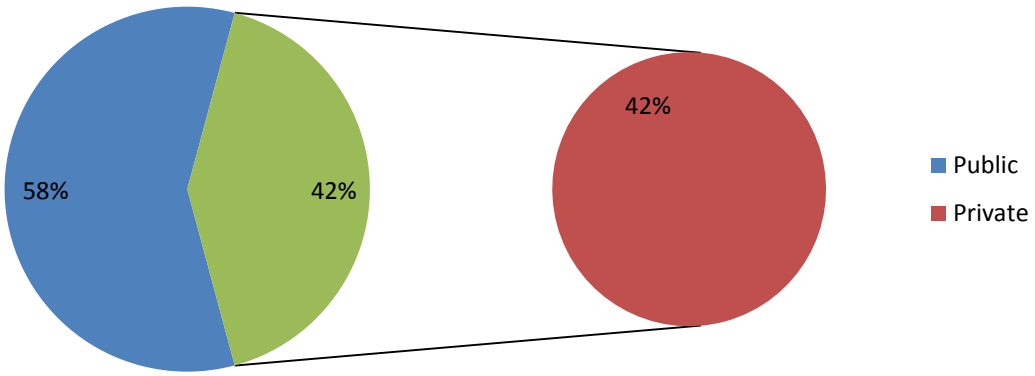

Figure 4.12: Industrial Units by Ownership of Organisations

Industrial Units by Type of Organisation

Going by the types of organisations, 32.0 per cent is into manufacturing and 68.00 per cent, marketing and retails (Figure 4.13).

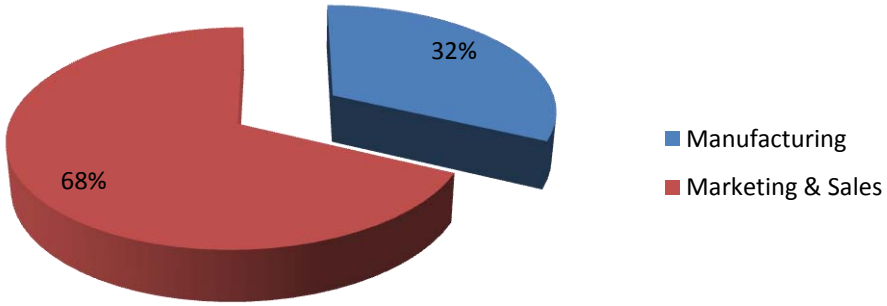

Figure 4.13: Industrial Units by Type of Organisation

4.1.3 Demographic Characteristics of Institutional Units

Altogether, 310 institutional subjects responded to the questionnaires. The largest proportion of them is from Lagos, 32.3%. This is followed by Ibadan, 16.1%. Others, Abeokuta, Osogbo, Ado Ekiti and Akure had 12.9% respondents each (Figure 4.14).

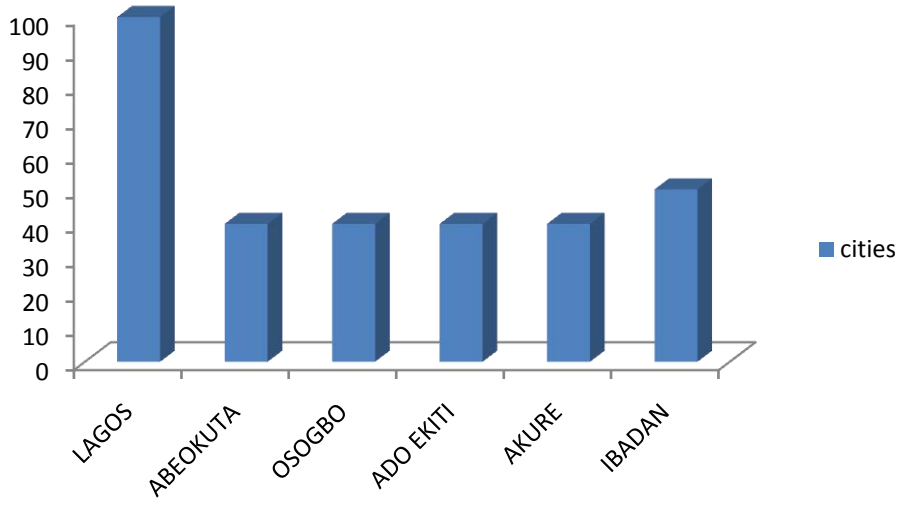

Figure 4.14: Sampled Institutions across the Cities

Job Types among Institutional Units.

The job description of the institutional respondents ranges from secretaries (4.8%), through machinists (10.6%) and security personnel (4.5%), to receptionists (27.7%) that are of lower cadres. The management status respondents include managers (29.7%), production supervisors (4.8%), and entrepreneur/owner (2.3%). Others include production staff 30, (9.7%) and procurement officer (5.80%) (Figure 4.I5).

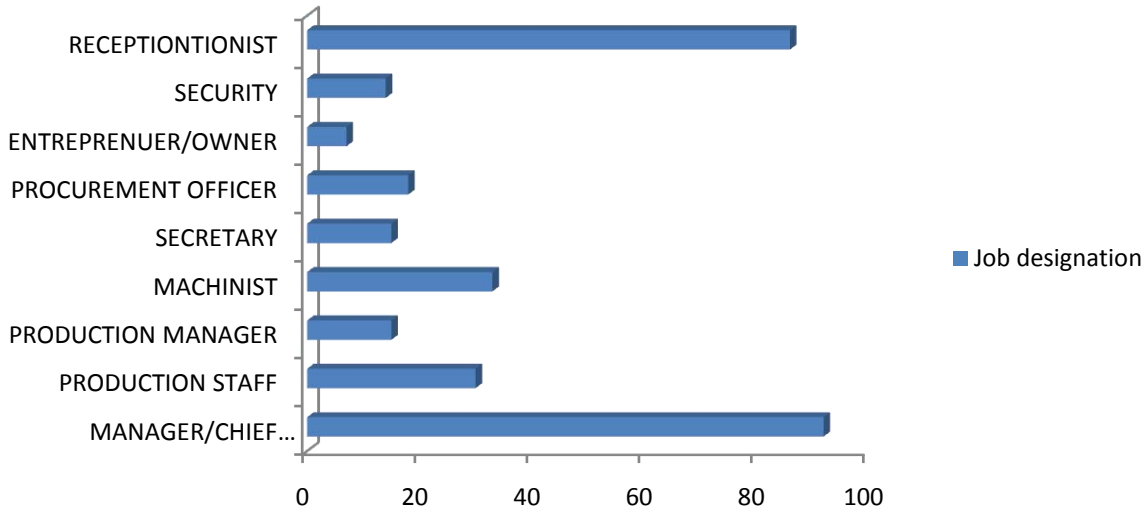

Figure 4.15: Job Types among Institutional Units

Institutional Units by Educational Qualifications

There is none of the respondents without education. The largest proportion 34.2% had primary and or secondary school education, 33.6% had OND/NCE certificate; 13.9% had HND and as much as 18.4% had University degree and Post graduate diploma (Figure 4.16).

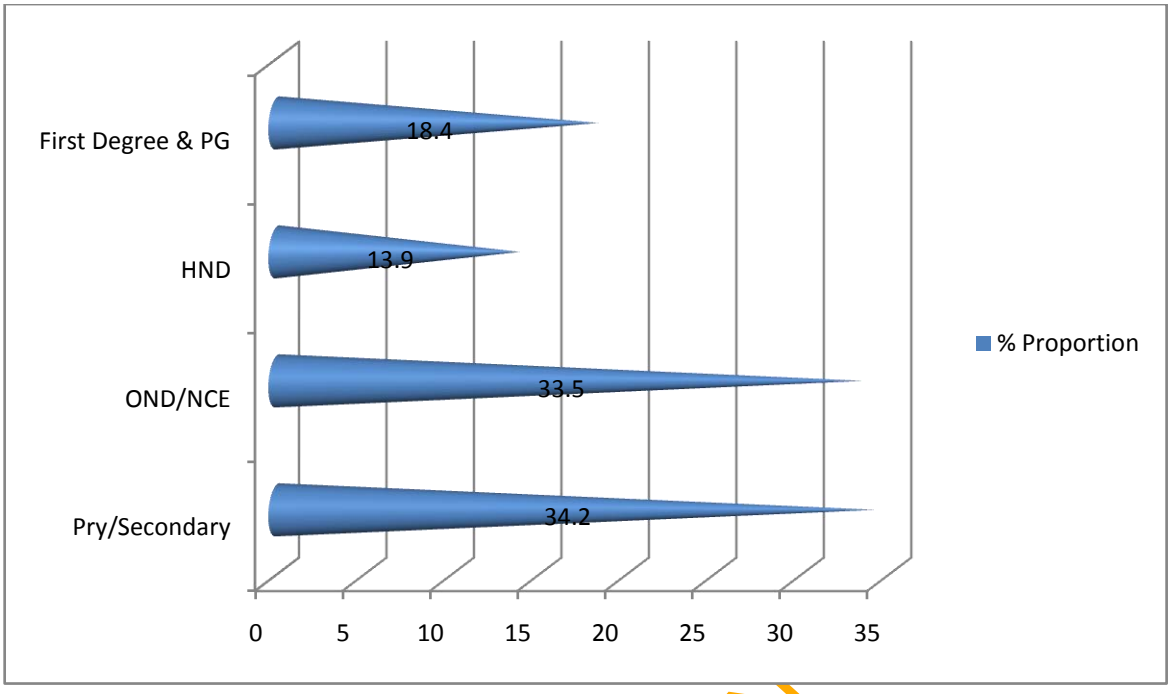

Figure 4.16: Institutional Units by Educational Qualifications

Institutions by Organisation Size

The size of these institutions, by number of members, range between less than 250 and greater than 500 members, 52.6% have 100 or less people, 9.0% have between 101 and 200 persons. Twenty-seven point seven per cent have between 301 and 400 people; and 2.6 per cent over 400 (Figure 4.17). In other words, 97.4 per cent of the organisations have less than 400 persons in their organisations.

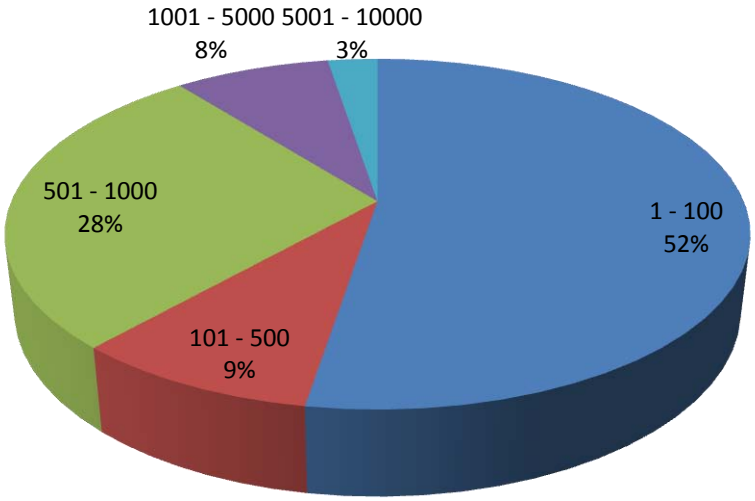

Figure 4.17: Institutions by Organisation Size.

Institutional Type

Thirty-four point two per cent) of the institutions are primary, secondary schools and tertiary educational institutions, 33.5% are religious places that is churches, mosques and so on, 13.9% are hospitals or clinics while the remaining 18.4% are government offices; (Figure 4.18).

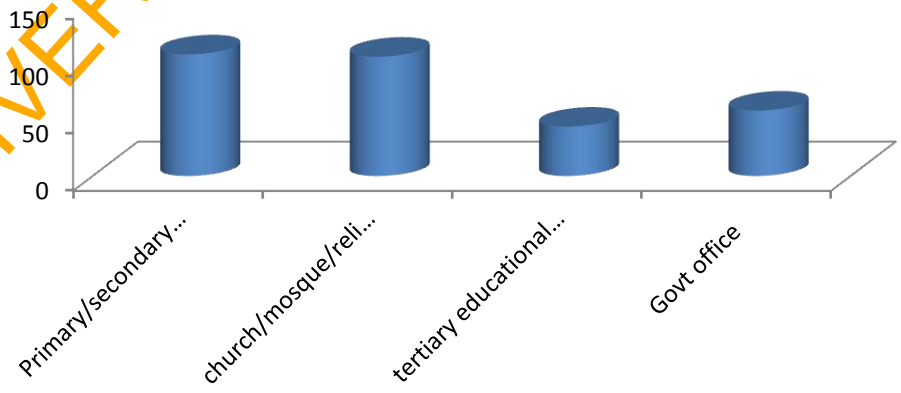

Figure 4.18 Institutional Types.

Institutions by Ownership

Fifty-four point eight per cent of the organisations are owned by governments; while 45.2% are owned by private individuals and groups (Figure 4.19). From the foregoing, the selected sample is a good representation of the population of the study area. The respondents selected for the study cut across the entire population size of the urban centres, sex, age, marital status, religious affiliation, ethnicity, employment status, income distribution, educational qualification, family size, size and types of organisations found in the urban centres in South Western Nigeria.

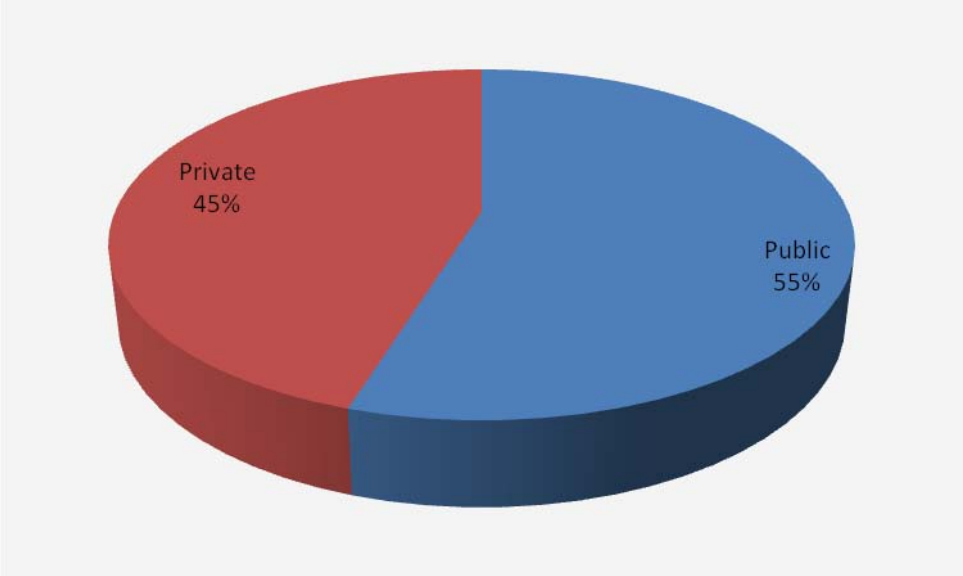

Figure 4.19: Institutions by Ownership

4.2 Testing of Research Questions and Hypotheses

Determinants of Solid Waste Management Behaviour

The influence of Government Activities and psycho-social factors in determining solid waste management behaviour in South Western Nigeria is presented in this section.

Research question 1:

4.2.1 Governmental activities, Psycho-social Factors and Solid Waste Management Behaviour among Households

The analysis on how government activities and psycho-social factors predispose positive solid waste management behaviour among households was tested using MRA. The summary of the result is presented in Table 4.1.The discussion that follows provide the explanation on how the government activities and psycho-social factors determine solid waste management behaviour.

Table 4.1: Composite Effect of Government Activities and Psycho-social factors on Solid Waste Management Behaviour of Households

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	931.580	3	310.527	16.834	.000
	Residual	45378.410	2454	18.447		
	Total	46309.990	2456			

R= .14, R^2= .02, Adj. R^2= .02 SEM = 4.29

Table 4.2: Relative Effect of Governmental Activities and Psycho-Social on Solid Waste Management Behaviour among Households.

Household	Coefficients			Remark
Predictors	**Standardized Coefficients**	T	Sig.	
	Beta			
(Constant)		26.62	.00	
Government activities	-.43	-5.37	.00	**Significant**
Psychological factors	.53	4.59	.00	**Significant**
Social factors	.04	2.98	.00	**Significant**

Interpretation and Discussion

Table 4.1 indicates that the composite effect of government activities and psycho-social and factors on households' solid waste management behaviour is significant ($F_{(3, 2456)} = 16.834$; $R = .14$, $R^2 = .02$, Adj. $R^2 = .02$, $p<0.001$). The result indicates that the government activities and psycho-social (independent variables) have significant effect on solid waste management behaviour (dependent variables) among urban residents in South Western Nigeria. R and R^2 values obtained from the regression analysis are significant (Table 4.1). Independent variables of government activities and psycho-social factors when put together yielded a coefficient of multiple regression (R) of 0.14 and an adjusted $R^2 = 0.02$. This implies that 2% of the total variance in solid waste management behaviour

of the household members is accounted for by a combination of the independent variables. This indicates that independent variables play important role when considering factors that influences negative or positive solid waste management behaviour among urban households in the six cities.

Further, the analysis on relative effect of independent variables on dependent variables reveals that psychological factors (β= .53; t = 4.59, p<0.05), social factors (β= .04; t = 2.98, p<0.05), and government activities (β= -.43; t = -5.37, p<0.05), made significant contributions to the prediction of solid waste management behaviour of households (Table 4.2). Psychological factors were found to be the major factors influencing waste management behaviour among the urban households.

The findings from this study support the work of Guagnano, et al (1995) that attitudinal factors and external conditions influence waste management behaviour. In their conceptualisation, external conditions included a broad range of factors, physical, financial, legal and social, all potentially facilitating or curtailing behaviour. Among the strongest evidence of the effects of external factors, they find that possession of a bin significantly impact on waste management behaviour (Guagnano, et al 1995). Also, the result of this study corroborate the work of Zimmerman & Rappaport (1988) that contextual factors such as location and location of waste bins have been identified to have direct effects on participation in waste management behaviour through the mechanism of psychological empowerment (Zimmerman & Rappaport, 1988). The result produced in the analysis also corroborates Ojedokun & Balogun (2010) that psychological factors predicted attitude towards littering behaviour better than socio-cultural characteristics.

The findings in Table 4.2, demonstrated that psychological factors are important determinant of solid waste management behaviour which is in concordance with the findings of Momoh & Oladebeye (2010). Momoh & Oladebeye (2010) found that

household size significantly affect waste management behaviour with respondents in the middle size family of between 5 and 7, more willing to participate in environmentally responsible waste management behaviour. They also find that employment status affects solid waste management attitude with civil servants willing to recycle more than others. Momoh & Oladebeye (2010) also demonstrate that income significantly affects solid waste management attitude as respondents in the middle income group were more willing to recycle.

Further analysis on how the independent variables influence the variation in solid waste management behaviour was carried out using mean weight comparison to ascertain which level of exhibited characteristics influence acceptable solid waste management behaviour. (See Appendices D, the impact of psychological variable on households' solid waste management behaviour E, impact of social variables on households' solid waste management behaviour; and F, impact of governmental activities on households' solid waste management behaviour). These impacts were analysed by comparing the weighted average scores on solid waste management behaviour based on the psycho-social factors. Respondents who perceived poor government environmental policy reported poor solid waste management behaviour compared to those with good perception of environmental policy. Residents who received high advocacy reported good solid waste management practices compared to those with low advocacy. On delineation of dumping site, households who reported that the area have no delineated waste dump sites reported poor solid waste management behaviour compared to those with properly delineated waste dump sites. Respondents living in areas where provision of bins and transportation facilities are not available reported poor solid waste management practices compared to respondents in areas where bins and transportation are provided.

Also, results reveal that residents with poor attitudinal disposition towards proper waste management practices reported poor solid waste management practices compared to those with positive attitude towards the environment. Respondents with low aesthetic value reported poorer solid waste management practices compared to those with high aesthetic value. Also, respondents with poor environmental and neighbourhood appreciation reported better solid waste management practices compared to those with good environmental neighbourhood affectation. Finally, respondents who do not receive income reported better solid waste management behaviour compared to others. These findings complement and strengthen those reported by Guagnano, et al (1995) & Egunjobi (1986) on the role of government activities and psycho-social in responsible solid waste management behaviour. In their conceptualisation, external conditions included a broad range of factors, physical, financial, legal and social, all potential facilitating or curtailing behaviour.

The results were supported by the findings from the in-depth interview (IDI) with the waste management practitioners in Lagos, Abeokuta and Ibadan. In the interview with a Waste Management expert, he notes that factors affecting solid waste management are multifaceted, lack of equipment and transportation. He submits that:

> Lagos is one of the six mega cities in the world where the population is more than 10 million people. For you to move waste in Lagos from a transfer station to the dump site, you cannot make up to two trips before the end of the day. In other cities where the population is not as dense, you can make 10 trips. Invariably, traffic congestion becomes a problem in waste disposal and management. Again, the peculiarity of Nigerians attitudes is another potent factor. …. We have just come from a strike. We are now looking at the backlog of wastes for over a week unattended to. …. We do not need anybody to tell us that waste management should occupy priority position in Nigeria, because of the multiplier effects. Apart from funding, there is another important problem – peoples' attitude… Now there is a gradual shift from government funding with management being transferred into private hands. We are looking at partial commercialisation intended to bring the people into focus……. In fact, paying a stipend of N 150 to N200 for

> refuse to be collected monthly is an uphill task collecting from house-holds.

This view was also supported by a focused group discussion (FGD) carried out in Abeokuta, Lagos and Ibadan revealed that the major challenge of poor waste management is people's attitude. Discussants identified that poor waste management has nothing to do with educational background or socio-economic position. According to a discussant:

> It is not an uncommon sight to see an educated man who lobs a cob of corn into the street corner unconcerned about the impact of his action on public health and the environment. The same attitude defines the behaviour of a woman or man who defecates and or urinates by the roadside on the assumption that if no one could see him, it must be okay to answer the call of nature anywhere and at any time. It is this disregard for sanctity of public health and our contempt for our environment that characterises the quality of life we live.

According to the discussants, most people in urban centres have bad sense of hygiene and it is one of the most difficult problems of the state. A discussant reacted thus:

> *Filthy roads, gutters and canals blocked with papers, bottles, cans, polythene bags and the ever-popular pure water nylons, ….; all these attest to the fact that Lagosians need to be cautioned. But it is not only Lagos residents who bear the mark of appalling attitude to waste disposal. It is also a common practice in Nigeria.*

Another discussant stated that:

> We live in a disorderly society in which no one cares about the welfare and wellbeing of others. It is a society in which everyone feels the government owes him something – to clean up their own mess. It is a society in which the government is perceived as the solution to all problems. Do we really need government to tell us how to maintain our environment? Do we need government to lift our level of personal hygiene in our own homes?

Research question 2

4.2.2 Governmental activities, Psycho-social Factors and Solid Waste Management Behaviour among Commercial and Industrial Units

For the joint and relative effects of independent variables on solid waste management behaviour among industrial firms, MRA was carried out to ascertain the

composite contributions of governmental activities and psycho-social factors to solid waste management behaviour (Tables 4.3.and 4.4).

Table 4.3: Composite Effect of Government Activities and Psycho-Social on Solid Waste Management Behaviour - Commercial/Industrial

Model		Sum of Squares	Df	Mean Square	F	Sig.
3	Regression	2061.11	3	687.04	3.65	.01b
	Residual	57540.18	306	188.04		
	Total	59601.29	309			
		$R = .18$, $R^2 = .35$, Adj. $R^2 = .02$ SEM = 13.71				

Table 4.4: Relative Effect of Government Activities and Psycho-Social on Waste Management Behaviour - Commercial/Industrial

Commercial/Industrial	**Coefficients**			**Remark**
Predictors	**Standardized Coefficients**	T	Sig.	
	Beta			
(Constant)		5.89	.00	
Government Activities	.12	1.30	.20	**Not significant**
Psychological variables	.32	2.36	.02	**Significant**
Social factors	.03	.45	.65	**Not significant**

Interpretation and Discussion

Table 4.3 shows that the composite effect of government activities and psycho-social on industrial waste management behaviour is significant ($F_{(3, 306)}$= 3.65, R= .18, R^2= .35, Adj. R^2= .02, p<0.001). From Table 4.4, governmental factor (β= .12; t = 1.30, *p*>0.05), and social factor (β= .03; t = .45, *p*> 0.05) did not make significant independent contributions to the prediction of waste management behaviour, while only psychological factor (β= .32; t = 2.36, *p*< 0.05) made significant independent contribution to the prediction of solid waste management behaviour of industries in urban centres,

The result produced in the summary of the analysis presented in Table 4.3 and 4.4, is similar to the findings in Guagnano et al (1995) that tested a model in which combined attitudinal factors and external conditions were found to influence waste management behaviour. Guagnano et al (1995) demonstrated that external conditions such as physical, financial, legal, and social, are all potential facilitators of responsible environmental behaviour. This study also supports the psychological model of waste management behaviour that psychological dispositions and attitude were central to individual and organisational actors' decision to act in an environmentally responsible manner (Zimmerman & Rappaport, 1988). The results of analysis above are in tune with the study of Ojedokun & Balogun (2010) who have demonstrated that socio-demographic characteristics influence are weakened in the presence of psychological factors which play a greater role in waste management attitudes.

However, the result of psychological factors as the major determinant of solid waste management behaviour among industries in urban centers is at variance with the findings from other studies which indicate that population growth, distance to and from disposal sites in the city, finance and lack of modern technology were the determinant of

the ineffectiveness of solid waste management behaviour among urban dwellers (Omoleke, 2004).

Further analysis on how government activities and psycho-social impacted on industrial waste management behaviour was carried out using mean weight comparison to ascertain how government activities and psycho-social factors influence the variations in solid waste management behaviour. (See Appendices G, the impact of psychological variable on industrial waste management behaviour; H, impact of social variables on industrial waste management behaviour; and I, impact of government activities on industrial waste management behaviour). These impacts were analysed comparing the average scores on waste management behaviour based on the respondents' exhibition of high or low scores on particular characteristics or traits in terms of the psycho-social and governmental variables. The mean comparison reveals that industrial organisations with acceptable attitudinal disposition reported responsible solid waste management practices compared to industrial organisations with poor attitude. Industrial organisations low in aesthetic value for the environment reported poor solid waste management practices compared to those with high aesthetic value (Appendix G, the Mean Weight comparison). Likewise, industrial organisations with poor neighbourhood appreciation reported poor solid waste management practices compared to those with good environmental neighbourhood appreciation.

Looking at the impact of the social variables on industrial waste management behaviour, the independent influence of social factor was not significant in the multiple regression analysis model, however the mean weight comparison based on the level of exhibitions or experiences of psycho-social and governmental variables reveal that industrial organisations with officers that have high educational awareness on solid waste management reported positive solid waste management practices compared to those with

low educational awareness. Organisations with those that have tertiary education reported good solid waste management practices compared to those with lower qualifications. Large industrial organisations reported better solid waste management practices compared to small organisations. Manufacturing industrial organisations reported poor solid waste management practices compared to those in service oriented organisations. Publicly owned organisations reported poor solid waste management practices compared to organisations under private ownership. Notably, these differences were found not to be significant (Appendix H).

The government activities were also found to cause a non-significant variation in industrial waste management behaviour. The mean weight comparisons reveal that industrial organisations who received high advocacy information reported good solid waste management practices compared to those with low advocacy information. Organisations who reported that there is a dump site close to their organisation reported better waste management than those with far dump sites. Organisations low in environmental awareness reported poor solid waste management practices compared to those with high level of environmental awareness. Organisations in the areas where bins and transportation were provided reported better waste management practices than organisations where bins and transportation facilities were not provided (Appendix I).

Most cities have widespread industrial waste management and pollution problems; this is peculiar to most urban centres in Nigeria with well-felt negative impact on public health, quality of environment and sustainable growth of the cities Ilemobade, 2004). Despite rapid industrialisation of the South Western Nigeria, little is being done in terms of legislation and design of a befitting industrial waste management system for the industries and the industrial zones (UNDP, 2002).

Research question 3

4.2.3 Governmental activities, Psycho-social Factors and Solid Waste Management Behaviour among Institutions

For the effect of government activities and psycho-social factors on solid waste management behaviours among institutions in the cities in South Western Nigeria, MRA was carried out to ascertain the composite effects. The result is presented in Tables 4.5 and 4.6. The tables present summary of the analysis, for the understanding, of the information on the data collected for Research Question 3, which explains how government activities and psycho-social factors determine private and public institutions' solid waste management behaviour.

Table 4.5: Composite Effect of Government Activities and Psycho-social Factors on Solid Waste Management Behaviour- Institutions.

Model		Sum of Squares	Df	Mean Square	F	Sig.
2	Regression	7911.92	3	2637.31	18.29	.00b
	Residual	52781.98	366	144.21		
	Total	60693.90	369			

R= .36, R^2= .13, Adj. R^2= .12 SEM = 12.01

Table 4.6: Relative Effect of Psycho-Social and Governmental Activities on Solid Waste Management Behaviour – Institutions.

Institution	Coefficients			Remark
Predictors	**Standardized Coefficients**	t	Sig.	
	Beta			
(Constant)		6.55	.00	
Governmental activities	.35	3.95	.00	**Significant**
Psychological variables	.38	4.12	.00	**Significant**
Social factors	.07	1.30	.19	**Not Significant**

Interpretation and Discussion:

Table 4.5 shows that the composite effect of government activities and psycho-social factors on institutions on solid waste management behaviour is significant ($F_{(3, 366)} = 18.288$, $R = .36$, $R^2 = .13$, Adj. $R^2 = .12$, $p<0.001$). Also, government activities ($\beta = .35$; $t = 3.95$, $p<0.05$),and psychological factors ($\beta = .38$; $t = 4.12$, $p<0.05$), made significant independent contributions to the prediction of solid waste management behaviour of institutions in urban centres, whereas, the contribution of the social factors ($\beta = .07$; $t = .30$, $p>0.05$) is not significant, (Table 4.6). These demonstrate that governmental activities through provision of dumping sites and legislation as well as the psychological disposition of the individuals heading the industrial/commercial institutions goes a long way in determining the waste management behaviour in the sector. Poor legislation and

enforcement as well as negative attitude towards clean and safe operating environment induce unfriendly and harmful waste management practices among the commercial and industrial managers.

These findings support the work of Steg & Vleg (2009) who identify the psycho-environmental factors especially psychological factors which have more significant influence on people's attitude to act in an environmental responsible manner. It also supports Agwu, (2012) that environmental perceptions have helped in understanding people's views and thinking about the environment. Environmental attitudes have been found to predict environmental awareness and waste management practices among communities (Agwu, 2012). The result from the analysis presented in Table 4.6, also supports the findings of Ojedokun & Balogun (2010) that psychological factors predict attitude towards littering the environment better than socio-cultural characteristics. Also, other researchers (Mensah & Whitney, 1991; Gigliotti, 1992 and Sheppard, 1995) have demonstrated that correlates of environmental knowledge as well as environmental quality awareness and concern were major determinants of waste management behaviour.

Notably, this result is at variance with the findings in earlier studies which report the significant impact of socio-demographic variables in solid waste management behaviour. For instance, Raudsepp (2001) submits that age, education and gender have strong and consistent significant relationship with solid waste management behaviour. In the same vein, Chanda (1999) notes that environmental concerns among business concerns of Gaborone vary according to education and income levels.

Also, analysis on how government activities and psycho-social factors impacted on institutional solid waste management behaviour was carried out using mean weight comparison of the solid waste management behaviour scores to ascertain which level of the exhibited psycho-social and Government Activities influences acceptable waste

management behaviour, (see: appendices J, the impact of psychological variable on institutional solid waste management behaviour; K, impact of social variables on institutional solid waste management behaviour; and L, impact of government activities on institutional solid waste management behaviour). These impacts were analysed looking at the average scores on waste management behaviour based on the psycho-social variables. The analysis using mean weight comparison of the impact of psychological variables on institutional waste management reveals that institutions with good attitudinal disposition reported good solid waste management practices compared to those with poor attitude. Institutions low in aesthetic value reported poor solid waste management practices compared to those with high aesthetic value. Likewise, institutions with poor Neighbourhood appreciation reported poor solid waste management practices compared to those with good environmental neighbourhood appreciation; (Appendix J).

In the case of the social factors, though their independent influence was not significant in the multiple regression analysis, this study notes that the impact of the social variables on institutional solid waste management behaviour also influences variations in institutions' solid waste management behaviour. The mean weight comparisons reveal that institutions with officers that have high educational awareness reported good solid waste management practices compared to organisations with officers that have low educational awareness. Institutions with officers that have higher educational qualification, reported good solid waste management behaviour compared to those that have low educational qualifications. Tertiary institutions reported good solid waste management practices compared to others. Large size institutions reported good solid waste management practices compared to small size institutions. Public owned organisations reported poor solid waste management practices compare to institutions owned privately ownership (Appendix K).

The impact of the government activities on institutional solid waste management behaviour reveals that institutions exposed to high advocacy information reported good solid waste management practices compared to those with low advocacy information. Institutions in areas where dumping sites were delineated reported good solid waste management practices compared to those with no delineated dumping sites. Institutions low in environmental awareness reported poor solid waste management practices compared to those with high environmental disposition. Likewise, institutions in areas where bins and transportation are not provided reported poor solid waste management practices compared to those in areas where bins and transportation were provided (Appendix L).

These findings are at variance with those of Ifegbesan, (2010) who found that respondents in educational institutions have adequate knowledge and awareness about environmentally responsible waste management behaviour. His work shows that more than 70% of the respondents sampled have good knowledge about proper waste disposal on campus. He observes that these disposal methods were not in practice in the households the students emanated from.

4.2. Testing of Hypothesis

4.2.4 Relationship between Government Activities and Solid Waste Management Behaviour

Ho_1: The relationship between government activities and solid waste management behaviour in the cities as stated in hypothesis 1 was tested in this section. The PCA was used and the following results on the basis of household, institution and industrial organisations are presented in Table 4.7.

Household

Table 4.7: Pearson Correlation on Relationship between Government Activities and each of Household, Industrial and Institutional Waste Management Behaviour.

Variables	Mean	S.D	Pearson r	Sig.	Remark
Solid waste management behavior	74.67	12.12			
Advocacy	23.37	4.22	**.07****	**<.01**	**Significant**
Delineation of dumping sites	18.59	5.40	**-.20****	**<.001**	**Significant**
Environmental policy formulation/Implementation	20.22	6.44	**-.16****	**<.001**	**Significant**
Provision of bins and transportation facilities	20.09	5.72	**-.21****	**<.001**	**Significant**

**. Correlation is significant at the 0.01 level (2-tailed).

Interpretation and Discussion

Table 4.7 shows that for households, there is significant positive relationship between advocacy (r =.07, p<.05) and solid waste management behaviour, while there is significant inverse relationship between delineation of dumping sites (r=-.20, p<.05), environmental policy formulation/Implementation (r=-.16, p<.05), provision of bins and transportation facilities(r=-.21, p<.05) and solid waste management behaviour. Given that the hypothesis states there is no significant correlation between each of delineation of dumping site, provision of bins and transportation facilities, environmental policy formulation/implementation, advocacies on the part of the government and solid waste management behaviour among households in urban centres, this hypothesis is thus rejected and the alternative hypothesis accepted.

These findings corroborate Al-Khatib (2009) who submits that participants cited insufficient garbage bins (or other disposal options) as the main cause of littering behaviour in the area studied. These findings also support Bamileke, (2004) that population growth, distance to and from disposal sites in the city, finance and lack of modern technology contribute to ineffectiveness of solid waste management behaviour

among urban dwellers. This finding is also in support of Reid, Luyben, Rawers, & Bailey (1976) that proximity of waste containers to the offices increases the newspaper recycling behaviour among staff in apartment complexes. In addition, three studies by Jacobs & Bailey (1979a, 1979b, describe in Geller, Winett, & Berett, (1982) find recycling to be significantly increased when citizens were supplied with a three-compartment source separation container.

Commercial/Industrial

Table 4.8: Pearson Correlation on Relationship between government activities and Industrial/Commercial Organisations Solid Waste Management Behaviour.

Variables	Mean	S.D	Pearson r	Sig.	Remark
Solid Waste Management Behaviour	70.07	13.88			
Advocacy	22.77	7.42	.03	**>.05**	**Not significant**
Delineation of dumping sites	21.25	4.43	.08	**>.05**	**Not significant**
Environmental policy formulation/Implementation	22.92	5.25	.05	**>.05**	**Not significant**
Provision of bins and transportation facilities	23.85	6.35	.13**	**<.01**	**Significant**

**. Correlation is significant at the 0.01 level (2-tailed).

Interpretation and Discussion

For industrial organisations, it is revealed that only the relationship between provision of bins and transportation facilities and solid waste management behaviour is significant (r=.13, *p*< .05).The result indicates there is no significant relationship between advocacy (r=.03, *p*>.05) environmental policy formulation/Implementation (r=.05, p >.05) and delineation of dumping sites (r=.08, p >.05) (Table 4.8). These findings are in contrast to Ilemobade (1999) and Egunjobi (1986) who identify the role of government activities in the poor waste management of industries in South Western Nigeria. Egunjobi (1986) identifies that poor state of solid waste management in South Western cities of Lagos, Ibadan, Abeokuta and so on is caused by inadequate facilities, poor funding and poor implementation of policies as well as wrong lifestyles (consumption pattern). Also

Humphrey, Bord, Hammond & Mann (1977) observe that office workers provided with waste disposal facilities exhibit responsible waste management behaviour and reported better behaviour than workers who were not given such facility.

Institutions

Table 4.9: Pearson Correlation on Relationship between Government Activities and Institutional Solid Waste Management Behaviour

Variables			Pearson r	Sig.	Remark
Solid Waste Management Behaviour	71.42	12.83			
Advocacy	21.25	4.43	.12**	<.001	Significant
Delineation of dumping sites	22.92	5.25	.23**	<.001	Significant
Environmental policy formulation/Implementation	23.85	6.35	.10	>.05	Not significant
Provision of bins and transportation facilities	20.12	7.15	.33**	<.001	Significant

**. Correlation is significant at the 0.01 level (2-tailed).

For institution, there is significant positive relationship between advocacy (r=.12,df = 310,p < .05), delineation of dumping sites (r=.23,df = 310,p < .05), provision of bins and transportation facilities(r=.33, df = 310, *p*< .05) and solid waste management behaviour. However, the relationship between environmental policy formulation/implementation and solid waste management behaviour is not significant (r=.10, p < .05) (Table 4.9).

These findings corroborate Longe, et al (2009) who establishes that waste management behaviour among respondents on solid waste management system were influenced by service providers and cost recovery methods. They also contend that the performance of the waste management authorities influence public opinions and

perceptions. Public opinion and perception on solid waste management system were characterised by irregularity and inefficient collection system and poor monitoring of the private waste service providers by the local authority.

According to Egunjobi (1986), the problem of effective solid waste management has to do with poor social services delivery efforts which often cause unnecessary delays in solid waste clearance. It is either broken down machinery, non-maintenance of dumpsters, poorly maintained urban streets and roads as well as irregularities in the designation of sanitary landfill sites. Observably, Nigerians' attitudes did not help matters as they seem to be permanently accustomed to dirt. Evidence can be seen every day by way of indiscriminate discharge of garbage into drains and at times on the highways (see Plates 1, 2.

According to a member FGD interviewed:

> We don't have a dump site here but the local government has waste disposal truck that normally come here to pick our refuse every Thursday during the environment day. Some factors affecting waste management behaviour in this area are lack of transportation facilities ….there are many places that the truck visit before coming here; and if they don't come, the waste piles up in a matter of days …
>
> (**Local Government. skill Acquisition centre**, pers. Comm., 2013)

This shows that Government Activities play a major role in the waste management outcome of respondents in this study and it has been identified as one of the major factors in solid waste management outcome.

4.2.5 Relationship between Psychological Factors and Solid Waste Management Behaviour.

Ho_2: To determine the relationship between psychological factors and solid waste management behaviour as stated in hypothesis 2, Pearson Correlation Analysis was used; and the following results on the basis of household, institutions and industrial/commercial set up were obtained (Table 4.10).

Household

Table 4.10: Pearson Correlation on the relationship between psychological factors and household solid waste management behaviour.

	Mean	S.D	r	Sig.	Remark
Solid Waste Management Behaviour	74.67	12.12			
Attitudinal Disposition	23.37	4.22	.18**	<.001	Significant
Aesthetic Value	13.59	4.40	-0.03	>.05	N.S
Neighbourhood Appreciation	14.22	5.44	-.10**	<.01	Significant

**. Correlation is significant at the 0.01 level (2-tailed).

Interpretation and Discussion

Table 4.10 shows that for households, there is significant positive relationship between attitudinal disposition and household solid waste management behaviour (r=.18, df = 2456, p <.05). The result also reveals that there is significant inverse relationship with Neighbourhood appreciation (r=-.03, df =2456, p>.01) and solid waste management behaviour, while there is no relationship between aesthetic value (r=-.09, df = 2456, p>.01) and solid waste management behaviour. The null hypothesis states there will be no significant relationship between each of attitudinal dispositions, aesthetic values, neighbourhood appreciation and solid waste management behaviour, that is rejected and the alternative is accepted.

The findings corroborate the earlier findings of Ojedokun (2011) which demonstrates the significant influence of personality and psychological variables such as altruism and locus of control in responsible waste management behaviour. Cary (1993) observes that instrumental beliefs, those which maximise personal interests, are significantly related with pro-environmental conduct; this relationship is not observed in comparing symbolic beliefs, which are based on convention. The findings also support

Ojeda-Benitez & Armijo de Vega (2005) who observes that the beliefs as a dispositional factor of conventional nature affect the behaviour of reuse and recycling.

Commercial/Industrial

Table 4.11: Pearson Correlation on the relationship between psychological factors and industrial solid waste management behaviour

	Mean	S.D	Pearson r	Sig.	Remark
Solid Waste Management Behaviour	70.07	13.88			
Attitudinal Disposition	21.97	2.16	.157**	<.001	Significant
Aesthetic Value	12.79	3.40	.148**	<.001	Significant
Environmental Neighbourhood Appreciation	13.72	1.44	.117*	<.001	Significant

**. Correlation is significant at the 0.01 level (2-tailed).

Interpretation and Discussion

For industrial, Table 4.11 reveals there is significant relationship between attitudinal disposition, (r=.15, df = 310, p<.05), aesthetic value (r=.14, df = 310, p<.05), Neighbourhood appreciation (r=.11, df = 310, p<.05) and solid waste management behaviour. The null hypothesis states there will be no significant relationship between each of attitudinal dispositions, aesthetic values, neighbourhood appreciation and solid waste management behaviour, this hypothesis is rejected and the alternative hypothesis accepted. These findings are synonymous with those of Barr (2001) who observes that the predictors of waste reduction, reuse and recycling behaviour differed significantly, with reduction and reuse being predicted by underlying environmental values, knowledge and concern-based variables. Recycling behaviour is, in contrast, characterised as highly

normative behaviour. In the same vein Cordano & Frieze (2000) as well as Flannery and May (2000) identify managers' attitudes as an important antecedent to preferences for industrial waste management behaviour. In this light, commercial and industrial organisations vary in terms of level of environmental commitment according to how strongly their executives embrace eco-centric values inherent in their beliefs systems.

Institutions

Table 4.12: Pearson Correlation on the Relationship between Psychological factors and Institutional Solid Waste Management Behaviour

	Mean	S.D	r	Sig.	Remark
Solid Waste Management Behaviour	71.42	12.83			
Attitudinal Disposition	21.65	3.47	.30**	<.001	Significant
Aesthetic Value	21.98	2.14	.12*	<.001	Significant
Neighbourhood Appreciation	21.45	6.49	.35**	<.001	Significant

**. Correlation is significant at the 0.01 level (2-tailed).

Interpretation and Discussion

For institutions there is significant positive relationship between attitudinal disposition (r=.30, df = 370, p <.05), aesthetic value (r=-.12, df = 370, p<.05), neighbourhood appreciation (r=.35, df = 370 p <.05) and solid waste management behaviour (Table 4.12). Given that the null hypothesis states there will be no significant relationship between each of attitudinal dispositions, aesthetic values, neighbourhood appreciation and solid waste management behaviours the hypothesis is thus rejected and the alternative hypothesis is accepted.

This indicates that waste management behaviour increases with positive attitudinal disposition, aesthetic value and neighbourhood affectation. This finding supports the

position of Ying (2010) who reports that positive attitudes towards waste management programmes have been shown to improve waste management behaviour. In the same vein Blaszczak (2011) investigated the influence of environmental aesthetics, crowding and the location of composting bins on waste management behaviour in students' cafeteria, he observes the composting habits of people during crowded versus un-crowded times this reveals that good waste management habits improve with crowding.

4.2.6 Relationship between Social Factors and Solid Waste Management Behaviour

Ho_3: In order to determine the relationship between social factors and solid waste management behaviour in the cities as raised by hypothesis 3, Pearson Correlation Analysis (PAC) was used and the following result on the basis of household, institution and industrial firms were obtained (Table 4.13).

Household

Table 4.13: Pearson Correlation on Relationship between Social Factors and Households' Solid Waste Management Behaviour.

Variables	Mean	S.D	Pearson r	Sig.	Remark
Solid Waste Management Behaviour	74.67	12.12			
Academic Qualification	**3.78**	**1.83**	**-0.03**	**>.05**	**N.S**
Family size	**1.74**	**0.73**	**0.00**	**>.05**	**N.S**
Education awareness	**28.66**	**4.08**	**0.02**	**>.05**	**N.S**
Culture belief	**14.28**	**4.1**	**-.08****	**<.001**	**Significant**
Income	**2.59**	**1.51**	**.21****	**<.001**	**Significant**

**. Correlation is significant at the 0.01 level (2-tailed).

Interpretation and Discussion

Table 4.13 reveals significant inverse relationship between solid waste management behaviour and cultural belief (r=-.08, df = 2465, p<.05) and income (r=.21,

df = 2465, p<.05). These suggest that responsible waste management behaviour decreases with unacceptable cultural beliefs and increases with income. Meanwhile, there is no significant relationship between qualification (r=-.03, df = 2465, p>.01) education awareness (r=-.02, df = 2465, p>.01), family size (r=.00, df = 2465, p>.01) and solid waste management behaviour; Given that the hypothesis states there is no significant correlation between each of academic qualification, family/ unit size, cultural affiliation, knowledge and awareness of environmental education, income and solid waste management behaviour is partially supported and the alternative hypothesis is accepted on the basis of households in urban centres.

These findings corroborate empirical findings in literature (Ojedokun & Balogun, 2009). Social factors have been found to influence individual affectation for the environment and responsible environmental management behaviours (Edgerton, 2009; Park 1998).The findings from this result is similar to those of Purcell & Magette, (2010) that the residents' view about paying for waste services have significant relationship with their waste management behaviour. Poor average income of respondents was found to be an important variable that influences people's perception and attitude negatively to solid waste management behaviour (Parfitt et al 1994).This result corroborates Salequezzaman et al, (2001), who observe that willingness to pay for community-based solid waste management influences the sustainability of responsible waste management behaviour in Bangladesh. Longe et al, (2009) also note that urban dwellers were willing to pay for the services if regularly provided and this perceived rate of willingness is bound to increase with higher income earnings and adequate environmental education of the populace. Cary (1993) observes that instrumental beliefs, that is those that maximise personal interests, are significantly related with pro-environmental conduct; this relationship was not observed in comparing symbolic beliefs based on convention. The role of culture in the

explanation of behaviour has been recognised by Sponsel (1987), Blum (1987) & Noe & Snow (1990); studies which profile the relationship between culture and environmental/individual action. Along this line, for example, Corral, Obregón, Frias, Piña & Barjas (1994) contend that cultural belief system are significant indicators of ecological competencies.

Commercial/Industrial

Table 4.14: Pearson Correlation on Relationship between Social Factors and Industrial Waste Management Behaviour.

Variables	Mean	S.D	N	Pearson r	Sig.	Remark
Solid Waste Management Behaviour	70.07	13.88				
Organisational size	1.99	1.16	310	-0.064	>.05	N.S
Educational Qualification	2.16	1.09	310	0.034	>.05	N.S
Type of organisation	1.30	.46	310	0.011	>.05	N.S
Ownership	1.45	.49	310	0.098	>.05	N.S

**. Correlation is significant at the 0.01 level (2-tailed).

Interpretation and Discussion

Table 4.14; shows there is no significant relationship between organisational size (r=-.06, df = 310, p>.05), educational qualification of respondents(r=.03, df = 310, p>.05), type of organisation (r=-.01, df = 310, p<.05), ownership (r=.09, df = 310, p<.05) and waste management behaviour. Overall, the result indicates that no social factor is significantly associated with solid waste management behaviour. Given that the hypothesis states there is no significant correlation between each of academic qualification, family/ unit size, cultural affiliation, knowledge and awareness of environmental education, income and solid waste management behaviour is supported.

These results from the analysis did not support the findings from literature (Purcell & Magette, 2010). The findings contrast those of Purcell & Magette, (2010) that a significant association exists between type of business (education, restaurant, hotel) and respondents' views on paying for waste management services and significant associations between reasons given for beliefs on payments for waste services and whether businesses were publicly or privately owned. Based on these findings, it is suggested that industries that are located where waste management facilities are provided will show more responsible waste management behaviour than organisations located where waste management facilities are not provided.

Institutions

Table 4.15: Pearson Correlation on Relationship between Social factors and Institutional Solid Waste Management Behaviour.

Variables	Mean	S.D	N	Pearson r	Sig.	Remark
Solid Waste Management Behaviour	71.42	12.83				
Highest qualification	**3.95**	**1.84**	**370**	**0.011**	**>.05**	**N.S**
Organisational size	**1.48**	**.71**	**370**	**0.05**	**>.05**	**N.S**
Type of organisation	**8.79**	**8.09**	**370**	**0.074**	**>.05**	**N.S**
Ownership	**1.63**	**.81**	**370**	**0.024**	**>.05**	**N.S**

**. Correlation is significant at the 0.01 level (2-tailed).

Interpretation and Discussion

The result displayed in Table 4.15 shows there is no significant relationship between qualification of respondents (r =.01, df = 370, p >.05), organisational size (r =.05, df = 370, p >.05), type of organisation (r =-.07, df = 370, p > .05), ownership (r

=.02, df = 370, p >.05) and solid waste management behaviour. Table 4.15 is quite revealing. Given that the hypothesis states there is no significant correlation between each of academic qualification, family/ unit size, cultural affiliation, knowledge and awareness of environmental education, income and solid waste management behaviour is supported.

This finding contradicts studies that find significant contribution of organisational type and size to institutional waste management behaviour. The finding is in contrast to Purcell & Magette, (2010) that find a significant association between difficulty people encounter in managing waste and the local authority in which they are located. They also observe a significant association between type of business (education, restaurant, and hotel) and their views on paying for waste services and significant associations between reasons given for beliefs on payments for waste services and whether businesses were publicly or privately owned.

4.2.7 Differences in the Impact of Government Activities and Psycho-social factors on Solid Waste Management Behaviour across the Cities.

Ho_4: In order to determine the differences in the impact of government activities and psycho-social factors on solid waste management behaviour on the basis of households/residential, commerce/industrial and institutions in the urban centres as stated in hypothesis 4, MRA was used, the results are presented on the basis of household, industrial and institutions.

Household

Table 4.16: Composite and Relative Effect of Governmental Activities and Psycho-Social Factors on Waste Management Behaviour of Households across the Cities.

	Lagos City		Abeokuta		Oshogbo		Ado Ekiti		Akure		Ibadan	
Variables	B	T	B	T	B	T	B	T	B	T	B	T
Government Activities	-.149	-3.342	-.089	-1.741	.136	2.659	.036	.655	.066	1.181	.075	1.458
Psychological Factors	.242	5.244	.199	3.812	.002	.038	-.052	-.956	-.112	-1.994	-.160	-3.124
Social factors	.111	2.501	-.029	-.577	-.111	-2.198	-.030	-.594	.064	1.247	.088	1.799
R	.291[b]		.197[b]		.181[b]		.060[b]		.119[b]		.190[b]	
R Square	0.085		0.039		0.033		0.004		0.014		0.036	
R Square adjusted	0.079		0.031		0.025		-0.004		0.006		0.029	
F	15.33		5.158		4.312		0.464		2.809		5.221	
Sig.	.000[c]		.002[c]		.005[c]		.707[c]		.050[c]		.002[c]	

Interpretation and Discussion

The results displayed in Table 4.16 indicate that government activities and psycho-social factors predict solid waste management behaviour across the five cities in the study. The multiple regression (R) and adjusted R^2 for the cities of Lagos (R = 0.29, R^2= 0.08), Abeokuta (R = 0.19, R^2= 0.03), Oshogbo(R = 0.18, R^2= 0.03), and Ibadan (R = 0.19, R^2= 0.03) are significant. However, that of Ado-Ekiti (R = 0.60, R^2= 0.00.) is not significant. This implies that 1to 9% of the total variance in solid waste management behaviour of the household members in the five cities is accounted for by a combination of the independent variables.

Also, the result from the Table 4.16 reveals that significant influence of government activities on waste management behaviour was found among households in

Lagos (β= -.14; t = -3.34, p<0.05), and Oshogbo (β= .13; t = 2.65, p<0.05). However, government activities did not significantly influence the solid waste behaviour of households in Abeokuta (β= -.08; t = -.17, p>0.05), Ado- Ekiti (β= .03; t = .65, p>0.05), Akure (β= .06; t = 1.18, p>0.05) and Ibadan, (β= .07; t = 1.45, p>0.05).

Psychological factors significantly influence the solid waste management behaviour of households in Lagos (β= .24; t = 5.24, p<0.05), Abeokuta (β= .19; t = 3.81, p<0.05), Akure (β= -.11; t = -1.99, p<0.05) and Ibadan, (β= -.16; t = -3.12, p<0.05). Psychological factors did not influence the waste management behaviour of households in Oshogbo (β= .00; t = .03, p>0.05), and Ado- Ekiti (β= -.52; t = -.95, p>0.05).

Significant influence of social factors on the solid waste behaviour of households was found among respondents from Lagos (β= .11; t = 2.50, p< 0.05) and Oshogbo (β= -.11; t = -2.19, p< 0.05). Meanwhile, social factors did not significantly influence the solid waste management behaviour of households in Abeokuta (β= -.02; t = -.57, p> 0.05), Ado- Ekiti (β= -.03; t = -.59, p> 0.05), Akure (β= .06; t = 1.24, p> 0.05) and Ibadan, (β= .08; t = 1.79, p> 0.05).

The findings show that the distributions of the effect of government activities and psycho-social factors and were not equal across the six cities. Psychological factors were significant across four cities excluding Oshogbo and Akure while social and Government Activities were significant for Lagos and Oshogbo only. These findings also support Guagnano, et al (1995) contention that combined attitudinal factors and external conditions act to influence waste management behaviour. Also, these findings corroborate the study of Zimmerman & Rappaport, (1988) on contextual factors such as location of dumping site and location of waste dumps have been identified to have a direct effect on participation in waste management behaviour through the mechanism of psychological empowerment (Zimmerman & Rappaport, 1988).

Commercial/ Industrial

Table 4.17: Multiple Regression Analysis of Composite and Relative Effects of Government Activities and Psycho-Social Factors on Waste Management Behaviour of Industries.

	Lagos city		Abeokuta		Oshogbo		Adoekiti		Akure		Ibadan	
Variables	β	T	B	T	B	T	B	T	β	t	B	t
(Constant)		2.510		1.158		2.686		-.328		3.231		2.982
GOVERNMENT ACTIVITIES	.012	.126	.285	1.787	-.163	-1.998	.175	1.098	.219	1.33	.401	2.097
PSYCHOLOGICAL FACTORS	.115	1.963	.027	.168	.105	2.634	.180	2.150	.059	.353	.165	2.355
SOCIAL FACTORS	.246	2.496	.196	1.238	.058	.351	.235	1.505	.361	2.30	.058	.421
R	.275[b]		.337[b]		.210[b]		.394[b]		.430[b]		.469[b]	
R Square	0.075		0.113		0.044		0.156		0.185		0.22	
R adjusted	0.047		0.04		0.035		0.09		0.12		0.17	
F	2.613		2.535		2.956		2.212		2.718		4.316	
Sig.	.051[c]		.050[c]		.050[c]		.041[c]		.043[c]		.009[c]	

Interpretation and Discussion

The display in Table 4.17 indicates that government activities and psycho-social factors predict solid waste management behaviour across the six cities used in the study. The multiple regression (R) and adjusted R^2 for the cities of Lagos (R = 0.27, adjR^2= 0.05), Abeokuta (R = 0.33, adjR^2= 0.04), Oshogbo(R = 0.21, adjR^2= 0.04), Ado-Ekiti (R = 0.39, adjR^2= 0.09), Akure (R = 0.43, adjR^2= 0.12), and Ibadan (R = 0.46, adjR^2= 0.17) are significant. This implies that 5 to 17% of the total variance in solid waste

management behaviour of the industries in the six cities was accounted for by a combination of the independent variables.

Government Activities significantly influence industrial solid waste management behaviour of industries located in Ibadan (β= .40; t = 2.09, p< 0.05). While Government Activities did not significantly influenced solid waste management behavior in Lagos(β= .01; t = .12, p> 0.05), Abeokuta (β= .28; t = 1.78, p>0.05), Oshogbo (β= -.16; t = -.99, p> 0.05), Ado Ekiti (β= -.17; t = 1.09, p> 0.05), and Akure (β= .21; t = 1.33, p> 0.05).

Psychological factors significantly influence the industrial solid waste management behaviour of industries located in Lagos (β= .11; t = 1.96, p< 0.05), Oshogbo (β= .11; t = 2.63, p<0.05), Ado- Ekiti (β= .18; t = 2.15, p<0.05), and Ibadan, (β= .17; t = 2.35, p<0.05). However, the result reveals that psychological factors did not significantly influence the industrial solid waste management behaviour of industrial organisations located in Abeokuta (β = .02; t = .16, p > 0.05), Akure (β = .05; t = .35, p > 0.05)

Social factors significantly influence the solid waste management behaviour of industries in Lagos (β= .24; t = 2.49, p<0.05) and Akure (β= .36; t = 2.30, p>0.05). However, they did not significantly influence solid waste management behaviour in Abeokuta (β= .19; t = 1.23, p>0.05), Oshogbo (β= .05; t = .35, p>0.05). Ado- Ekiti (β= .23; t = 1.50, p>0.05), and Ibadan, (β= .05; t = .42, p>0.05).

This finding contradicts Black, Stern & Elworth (1985) who contend that attitudes predict low-cost residential energy improvements but not high-cost ones. In the same vein, these findings negates Reid, Luyben, Rawers & Bailey (1976) who aver that proximity of waste containers increase newspaper recycling in apartment complexes. Also, Humphrey, Bord, Hammond & Mann (1977) posit that office workers with wastebaskets divided for recyclables and non-recyclables recycled more than workers

with one wastebasket for recyclables and other trashes. In addition, three studies by Jacobs & Bailey (1979a, 1979b, described in Geller et al, 1982) found recycling to be significantly increased when citizens were supplied with a three-compartment source separation container.

Institutions

Table 4.18: Multiple regression analysis of composite and relative effect of government activities and psycho-social factors on waste management behaviour of institutions.

	LAGOS CITY		ABEOKUTA		OSHOGBO		ADOEKITI		AKURE		IBADAN	
Variables	β	T	B	t	β	T	B	T	B	T	B	t
(Constant)		2.883		3.739		-.093		2.446		2.026		1.240
GOVERNMENT ACTIVITIES	.190	1.944	.052	.384	.199	1.492	.178	1.063	.016	.103	.312	2.476
PSYCHOLOGICAL FACTORS	.063	0.647	.458	3.444	.410	2.855	.040	.273	.096	.584	.255	2.017
SOCIAL FACTORS	.269	2.716	.067	.496	.138	.957	-.071	-.428	-.096	-.572	.051	.462
R	.384[b]		.464[b]		.443[b]		.235[b]		.105[b]		.483[b]	
R Square	0.148		0.216		0.196		0.05		0.011		0.233	
Adjusted R square	0.121		0.164		0.144		0.05		-0.054		0.198	
F	5.549		4.215		3.738		0.899		0.17		6.685	
Sig.	.001[c]		.010[c]		.017[c]		.449[c]		.916[c]		.001[c]	

Interpretation and discussion

Table 4.18 indicates that psycho-social factors of government activities and psycho-social factors predict solid waste management behaviour across four cities in the study. The multiple regression (R) and adjusted coefficient of determination for the cities of Lagos (R = 0.38, adjR^2 = 0.12), Abeokuta (R = 0.46, R^2 = 0.16), Oshogbo(R = 0.44, AdjR^2 = 0.14), and Ibadan (R = 0.48, AdjR^2 = 0.20) were significant. This implies that 12 to 20% of the total variance in solid waste management behaviour of the institutions in the four cities was accounted for by combined independent variables. Nevertheless, the regression (R) and adjusted coefficient of determination for the cities of Akure (R = 0.10, R^2 = 0.05) and Ado-Ekiti (R = 0.23, R^2 = 0.05) are not significant.

Government activities significantly influence solid waste management behaviour of institutions in Ibadan (β = .31; t = 2.47, $p < 0.05$), but they did not influence the solid waste management behaviour in Lagos (β = .19; t = 1.94, $p > 0.05$), Abeokuta (β = .05; t = .38, $p > 0.05$), Oshogbo (β = .19; t = 1.49, $p > 0.05$), Ado Ekiti (β = .17; t = 1.06, $p > 0.05$), and Akure (β = .01; t = .10, $p > 0.05$).

Psychological factors significantly influence solid waste behaviour of institutions in Abeokuta (β = .45; t = 3.44, $p < 0.05$), Oshogbo (β = .41; t = 2.85, $p < 0.05$), and Ibadan, (β = .25; t = 2.01, $p < 0.05$). However, psychological factors did not significantly influence waste behaviour of institutions in Lagos (β = .06; t = .64, $p > 0.05$), Ado-Ekiti (β = .04; t = .27, $p > 0.05$), and Akure (β = .09; t = .58, $p > 0.05$).

Social factors significantly influence waste behaviour of institutions in Lagos (β = .26; t = 2.71, $p < 0.05$), while they did not influence waste behaviour of institutions in Abeokuta (β = .06; t = .49, $p > 0.05$), Oshogbo (β = .13; t = .95, $p > 0.05$). Ado-Ekiti (β = -.07; t = -.42, $p > 0.05$), Akure (β = -.09; t = -.57, $p > 0.05$) and Ibadan, (β = .05; t = .46, $p > 0.05$).

The results indicate that factors responsible for waste management behaviour vary across the six cities. The result reveals that combined social variables are the major factors determining solid waste management behaviour among institutions in Lagos. For Abeokuta and Oshogbo, the major variables influencing solid waste management behaviour was psychological factors that is attitude and appreciation for their environment, while institutional solid waste management behaviour in the city of Ibadan was influenced by a combination of psychological factors comprising; attitude, appreciation for their environment and government activities.

This finding contradicts Longe et al (2009), Ilemobade (1999) & Egunyomi (1986) on the role of government activities in the poor waste management in the South Western Nigeria. Egunjobi (1986), identify that poor state of solid waste management in South Western cities of Lagos, Ibadan, Abeokuta and so on is caused by inadequate facilities, poor funding and poor implementation of policies as well as wrong lifestyle (consumption pattern).

Research question 4:

4.2.8 Perceptions of, Attitude to and General Knowledge about Solid Waste Management Behaviour and Environmental Education in Selected Cities

The extent of the perceptions of, attitude to and general knowledge about solid waste management behaviour and environmental education in selected cities are analysed using the average mean weight and frequency tables. The analysis and results took three dimensions: along the basis of household, industry and institution.

Table 4.19: Differential Attitude and Solid Waste Management Behaviour

	Household	Industrial	Institution
	Mean	Mean	Mean
Lack of waste bin and open dumping	1.9643	2.5258	3.0811
Attitude to reuse and recycling	1.8673	2.6613	3.1892
Attitude to burning	2.0272	2.9355	2.6622
Following governmental regulation	1.8588	3.1258	2.9108
Total	7.7176	11.2484	11.8433

Interpretation and Discussion

Table 4.19 shows an analysis of attitude of the respondents on waste management behaviour; the institutional respondents reported more positive attitude towards waste management behaviour by not dumping waste in an open site compared to households and industrial respondents. It was also revealed that the institutional respondents reported more positive attitude about the reuse and recycling of waste compared to respondents in households and industries who reported negative attitude towards reuse and recycling. Respondents in industries reported more positive attitude to waste management behaviour by not burning waste in the open or road side compared to household and institution respondents who reported poor attitude of engaging in waste burning and road side dumps. Also, industrial respondents reported more positive waste management behaviour towards governmental regulations compared to respondents in institutions and households who generally do not obey government regulations on waste management.

Table 4.20: Education and Awareness of Waste Management

	Mean Household	Mean Industrial	Mean Institution
Awareness of waste separation and categories of waste	3.0856	2.7387	3.1595
knowledge of impact of waste management on flooding and environmental hazard	3.1201	2.8710	2.9351
Perception of poor waste management and increasing pest and diseases in the area	2.5302	2.6355	2.1811
Awareness of proper waste management through TV and Radio.	3.0909	2.8323	2.6378
Total	11.8268	11.0775	10.9135

Interpretation and Discussion

In respect of education and awareness of waste management behaviour, Table 4.20 shows that high level of educational awareness is higher among institutions compared to households and industries on the knowledge about waste separation and categories of waste. It is also revealed that households have better knowledge of impact of waste management on flooding and environmental hazard compared to respondents from institutions and industries who reported poorer knowledge of the impact of waste management on flooding and environmental hazard. Respondents in industries reported better knowledge of how poor waste management increases pest and diseases in the area compared to households and institutions who reported poorer knowledge, The Table shows that household respondents reported highest level of informational awareness of proper waste management through TV and radio compared to institutions and households respondents who reported low level knowledge of proper waste management.

These findings indicate that knowledge and attitude vary across the households, industrial and institutions. This result demonstrates that institutions have better knowledge and awareness compared to household and industries. It also reveals that the institutions are the major sources of awareness that is, schools and governmental offices; as such, institutions have better knowledge than households and industries. The findings support the work of Purcell and Magette (2010) who observe that variations exist among businesses and households in waste management attitudes and behaviour. As Adesiyan (1998) assert waste positive management behaviour is still developing in Nigeria and as such, sound knowledge about it is still at its elementary levels in household and organisations in Nigeria. According to Adesiyan (1998), at present the training of waste generators and managers as regards waste recovery is virtually non-existent in Nigeria. Personal interviews also reveal that people generally burn their waste. For example, a sawmiller at ***Bodija ,Iso pako*** interviewed states that:

> 'We normally burn our waste; we set it on fire because it is saw dust. If the government provide a certain place or a truck for us to dump our saw dust, we will be happy and there will not be a dirty surrounding. There is no proper waste disposal mechanism here for example, such as providing waste Truck'
>
> (A sawmiller at ***Bodija, Iso pako***.Personal Communication. 2013)

> …… everybody in this area do come and dump their refuse….. in the waste trucks, If the government continue to send the truck every time there will be no problem. It is just advisable for government to send the truck most especially every Thursday, that is, environmental day.
>
> (Ibadan North Local Government Office, 2013)

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

This Chapter summarises the forgoing discussions, concludes and gives some recommendations. It outlines limitations of this work and identifies new research frontiers.

5.1 Summary

The purpose of this research is to determine the extent to which psycho-social and government activities predisposes solid waste management positive behaviour among residents of urban centres in South Western Nigeria. This is with a view of establishing the relevance of psycho-social and government activities in determining positive waste management behaviour .The research is in five chapters Chapter one dwell on the introduction, the objectives, and significance, scope and operational definitions of terms used in the study. In the second chapter, the study focuses on the literature review. This is made up of the theoretical framework, review of relevant concepts and review of related studies. The review of literature has shown that Nigeria remained largely a country with poor waste management practices induced by myriad of socio-demographic, psychological and Government Activities. Observably, several interventions have been designed to tackle the problem but did not yield the desired result based on evidence from past studies. The empirical review of past studies reveals that psycho-social and Government Activities play significant role in waste management behaviour. Also, the contributions of attitude and perception as determinants of solid waste management practices were identified. Chapter three is on methodology. This consists of the research design, instrument, procedure and method of statistical analysis. The research expands the model adopted to include psychological, social and government activities in its analysis of determinants of waste management behaviour. It is assumed that the intended result will

show that psychological factors, social characteristics and governmental practices will determine solid waste management behaviour of respondents in the South Western cities of Nigeria.

Chapter four is on data presentation, analysis and discussions of the research findings, while chapter five presents the summary, conclusion, policy implications, recommendations and contribution to knowledge, limitations of the study and suggestions for further studies.

The results reveal that the joint effect of government activities and psycho-social factors on households' solid waste management behaviour is significant ($F_{(3,\ 2456)}$ = 16.834; R= .14, R^2= .02, Adj R^2= .02, p<0.001). From this result, it could be concluded that 2% of the variance of solid waste management behaviour was accounted for by a linear combination of the independent variables. Government activities and Psycho-social factors were significant important predictors of solid waste management behaviour of households in urban centres. Psychological factors are found to be the most potent in influencing solid waste management behaviour among urban dwellers.

The composite effect of government activities and psycho-social factors on industrial solid waste management behaviour is also significant ($F_{(3,\ 306}$ = 3.654, R = .18, R^2 = .35, Adj R^2 = .02, p <0.001). From this result, it could be concluded that 2% of the total variance of solid waste management behaviour is accounted for by a linear combination of the total independent variables. Psychological factors made significant contributions to the prediction of solid waste management behaviour of industrial organization, while government activities and social factors did not make significant independent contributions to the variation in the solid waste management behaviour of industrial organisations in urban centres.

Government activities and psycho-social factors also predicted institutional solid waste management behaviour ($F_{(3, 366)} = 18.288$, $R = .36$, $R^2 = .13$, Adj $R^2 = .12$, $p<0.001$). Some 12% of the total variance in solid waste management behaviour is accounted for by a linear combination of the total independent variables. Government activities and psychological factors make significant independent contributions to the prediction of solid waste management behaviour of institutions in urban centres while the contributions of social factors are not significant.

For the relationship between psychological factors and solid waste management behaviour, on households, it is noted that there is significant positive relationship between attitudinal dispositions and solid waste management behaviour, while significant inverse relationship existed between neighbourhood appreciation and solid waste management behaviour. However, no significant relationship existed between aesthetic value and solid waste management.

For industrial organisations, it was revealed that there was significant relationship between attitudinal disposition, aesthetic value, neighbourhood appreciation and solid waste management behaviour, for institutions, there was significant positive relationship between attitudinal disposition, aesthetic value, neighbourhood appreciation and solid waste management behaviour.

The summary of the contribution of the social factors reveals that solid waste management behaviour had inverse relationship with cultural belief and income among households.

Among industries there was no significant relationship between organisational size, educational qualification, type and ownership of organisations and solid waste management behaviour. For institutions, there was no significant relationship between the

qualification of respondents, organisational size and type of organisation, ownership and solid waste management behaviour.

Looking at the relationship between government activities and solid waste management behaviour, the results show that, for household, there was significant positive relationship between advocacy and waste management behaviour, while there was significant inverse relationship between delineation of dumping sites, environmental policy formulation/implementation, provision of bins and transportation facilities and solid waste management behaviour. For the industrial sector, it is revealed that there is significant positive relationship between solid waste management behaviour and provision of bins and transportation facilities. However, there was no significant relationship between advocacy, delineation of dumping sites, environmental policy formulation/implementation and solid waste management behaviour. In case of institutions, there was significant positive relationship between advocacy, delineation of dumping sites, provision of bins and transportation facilities and solid waste management behaviour while significant relationship does not exist between environmental policy formulation/implementation and solid waste management behaviour.

5.2 Conclusion

This study has shown that services provided for solid waste management, psychological and social factors identified predispose the households, industrial and institutions to poor waste management behaviour in South Western cities of Nigeria. Strategies to improve solid waste management in South Western cities must take into consideration these identified factors with a view to reduce negative influence and promoting positive influences on solid waste management behaviour. Psychological factors are the major determinants predisposing poor solid waste management behaviour which have significant implications for how widespread the problem of solid waste is

across the cities. Thus, government activities and psycho-social factors have implications on the nature and type of interventions that could be implemented in these cities. The government should play a major role through the provision of state-wide environmental education and far-reaching attitudinal change, and information awareness programmes which should inculcate waste reduction and reuse strategies. Adequate funding, materials, manpower and creating an enabling environment for private investors in solid waste management including recycling activities should be inculcated

5.3 Policy Implications

This study combined variables that have been hitherto studied separately neglecting the combined influence of government activities and psycho-social factors contribution to the challenges of waste management in South Western Nigeria. Different policies introduced by successive state administration across the six cities have failed due to the inability of the government to incorporate socio-cultural values and orientation as well as the psychological disposition of urban dwellers and institutions into these interventions. For example, past governmental laws and regulations such as War Against Indiscipline (WAI), Keep Nigeria Clean (KNC), Kick Against Indiscipline (KAI), every-last Saturday of month environmental sanitation exercise, Clean Up and Green Up and other various attempts at maintaining good disposal habit had failed. This is as a result of inability to include citizens' socio-cultural attitude and consideration for the infrastructure available.

Till date and during the course of the introduction of these interventions government monitoring agencies continue to experience high rate of environmental offenders, court litigations and sabotage against these interventions when people have not been duly educated, provided with the necessary infrastructure and their opinions and attitudes were not taken into consideration in the design and implementation of these

policies, thereby changing the attitudes of citizens who are majorly adults with ineffective education, poor communication and poorly conducted mass awareness programme tend to be unproductive. Based on these, policy implementation needs very strong inputs from citizens and policy experts such as the adult educators for meaningful policy development and implementation.

5.4 Recommendations

5.4.1 Public Awareness and Education on Waste Management

There must be adequate public awareness on proper waste management towards changing urban dwellers attitude. This should be carried out on radio and television; at conferences, workshops, debates; and in schools and colleges about sustainable waste management behaviour. To change the attitude goes beyond mere presentation of the harmful effect of indiscriminate dumping of waste, rather it should include better ways of handling outside the government provided means of managing solid waste. To improve the attitude and dispositions of the government waste managers, industrial supervisors and corporate managers and functionaries toward effective waste handling. Government at the state level needs to organize regular workshops for the policy makers in both the public and private sector involved in waste disposal. There must be adequate capacity building and development; and orientation of management and staff. The support of Adult educators is required in the areas of design of educational programmes, workshops and capacity building towards creating public enlightenment programmes on disposal habits; and provision of facilities and amenities for positive management behaviour particularly at the grass root levels.

5.4.2 Provision of Modern Litter Bin in Strategic Locations

Litter bins are required and modern litter bins are mandatory. For technical solution, the state and local governments, waste management authorities, private and

public organisations and community groups and individuals should ensure adequate provision and prompt removal of litter bins. If community are involved in the provision and management of these they would be well informed about the usage of waste bins as this will minimise the negative habit of littering the environment. Waste, where practicable, should be segregated into at least three categories: (1) Paper, (2) Plastics (3) bottles, before collection for disposal. Segregation will facilitate collection, transportation, disposal and reuse. As a generator of waste, households, institutions and industries should ensure that they meet their obligations under the *Environmental Protection Act 1994*; and in households, industries and institutions cores for sustainable urban environment.

5.4.3 Local Government Proactive Participation

An executable master plan and implementation plans of waste management need to be provided by local council area. They have the primary role in planning solid waste management (SWM) programmes that ensure proper management of solid waste generated within their jurisdiction. Local government activities should include all part of integrated waste programmes, such as waste recycling, waste reduction and proper disposal of wastes. The public or the people in their communities need to be sensitised as regards the need of generating less waste and sorting. Education on sustainable waste management behaviour through local government health officers is imperative. The health officers and Adult educators should work in collaboration with community leaders and Adult educators to enforce all governmental policies and programmes for sustainable solid waste management behaviour in their respective communities.

5.4.6 Waste Avoidance

The generation of waste can be avoided by redesigning processes or products and/or improving maintenance and operation of equipment. The generality of urban dwellers need to be encouraged to retrace their roots: Consumption and dependence on

inorganic material should be discouraged at all levels while dependence on organic materials should be encouraged and embraced.

5.4.8 Waste Reuse/Recycling

The appropriate management and storage of wastes should prevent pollution and enhance opportunities for reuse. Thus, wastes should be turned to another product and or made to become an input into other materials. – Waste to wealth.

5.5 Contribution to Knowledge

The study has provided a framework for policy makers, government parastatal, industrialists, institutions and individuals in understanding of solid waste management in urban centers in SouthWestern, Nigeria. It has also added to the body of literature in urban renewal. It established that socio-cultural factors predispose people to poor management behaviour. People who strongly held on to their local beliefs about waste tend to have poor management practices. It has also established that government efforts at management disposal was largely undermined by the haphazard site of dumps and bins across cities coupled with the negative attitude or the poor habits of the urban dwellers who dispose their waste at any convenient point within their environment. They often do so because the delineated sites or bins are far away from their residential areas even among the industries and institutions.

The contribution of low education and awareness of the negative impact was appreciated in predisposing urban dwellers and institutions to poor management behaviours. Also, the contributions of perception of policy formulation and governmental efforts were negligible due to the low regard and poor perceptions of the states' environmental policies and enforcement.

5.6 Limitation to the Study

In the course of the research, certain constraints were encountered. Time was a major constraint to the actualisation of the research aim as relatively long time is needed for a research of this magnitude. Also, the non-documentation by government agency of amount of waste being generated, the numbers of public and private sectors involved in collection at different locations are all challenges to ease of access to adequate data and information required. Respondents felt sceptical and reluctant to accept the responsibility of completing questionnaires serious efforts were required to convince them to appropriately cooperate for completion of the required numbers at each instance. Similarly, Industrialists perceive the exercise as an attempt to collect data and information for purposes of tax and revenue collection by governments.

5.7 Suggestion for Further Studies

There are several opportunities for future research. This study is a cross-sectional survey study in which variables were largely described as they exist among the populace. Prospective research studies should utilise qualitative and quantitative methods, even incorporating experimental study approach towards a better understanding of solid waste and management not only in South Western Nigeria but in the entire country. This study is limited to sample of households, industrial and institutions in South Western Nigeria. Therefore, to a large extent the findings may not be generalised to other geopolitical zones within the country. Future study should look at increasing the number of participants, include participants from all the geopolitical zones in the country and if possible make comparisons. This is such that there would be comparison among the different parts of the country on the variables of the issues relating to solid waste management behaviour. It would also be interesting to investigate a longitudinal study to explore the relationship between psycho-social variables and solid waste management behaviour.

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APPENDIX A

DEPARTMENT OF ADULT EDUCATION
FACULTY OF THE EDUCATION
UNIVERSITY OF IBADAN

HOUSEHOLD UNITS WASTE MANAGEMENT QUESTIONNAIRE

Dear Respondent,

This questionnaire has been designed for research purpose. Your responses from this study are only useful if you supply honest and sincere responses to the questionnaire items. All information supplied by you shall be treated strictly with confidence. Thank you.

BIO DATA

1. Sex: (a) Male ( ) (b) Female ( )
2. *Age*: (a) 20-29 ( ) (b) 30-39 ( ) (c) 40-49 ( ) (d) 50 and above ( )
3. Marital status: (a) Single ( ) (b) Married ( ) (c) Divorced ( ) (d) Widowed ( ) (e) Separated ( )
4. Religion:(a) Christianity ( ) (b) Islam ( ) (c) Others ( ).
5. Employment: (a) Employed ( ) (b) Unemployed ( ) (c) Student ( ) (d) Retired ( ) (e) Not of working age ( )

SECTION A: PSYCHOLOGICAL FACTORS SCALE

Instructions: Read each statement carefully and give the right answers to these statements. For each of the following statements, tick (✓) the one out of the 4 – point scale that best describes how the statement applies to you.

Attitudinal disposition

1.	I love to reduce the amount of waste generated at home and work	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**
2.	I like participating in waste management activities in my area	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**
3.	I like attended any training, seminar, or workshop on environmental education/ management?	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**
4.	I have read about household products that are better for the environment.	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**

5. I actively seek information on how to reuse or recycle something rather than throw it away	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
6. I would love reduced water consumption for environmental reasons.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
7. Attended a meeting or signed a letter/petition to protect environment.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
8. Contributed to an organization that works to protect the environment.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
9. I don't like dirty environment	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
Environmental and neighbourhood affection/concerns				**Strongly agree** ( )
10. I am concerned with maintaining a good place to live	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
11. I have a strong interest in the health and well-being of the community in which I live	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
12. I love the natural look of my residential area	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
13. People like living in my area because it is neat and quiet	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
Aesthetic value for the environment				**Strongly agree** ( )
14. I beautify my room and surroundings.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
15. I sometimes enter a room which I find so ugly that I want to leave it immediately,"	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
16. I can rarely tell with certainty if I find something ugly or beautiful."	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
17. I often visit zoo and parks to see beautiful sights	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
18. Unwholesome dirty environment irritates me	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )

SECTION B: SOCIAL FACTORS SCALE

1. Ethnic group :.....
2. Income Range per month (a**)** No Income ( ) (2) Less than =N= 10000 ( ) (3) =N= 10001 to =N= 30000 ( ) (c) =N= 30000 to =N= 49999 ( ) (d) =N= 50000 to =N= 69999 ( ) (e) =N= 70000 to =N= 89999 ( ) (f) =N= 90000 or more
3. Highest qualification: (a) Secondary school certificate ( ) (b) Teachers training/Technical ( ) (c) OND/NCE ( ) (d) HND ( ) (g) Others specify……
4. Family size (a) 2 – 3 ( ) (b) 4 – 6 ( ) (c) 7 – 9 ( ) (d) Above 10 ( )
5. Area/Residence:……
6. work status (a) Working ( ) (b) Not Working ( )
7. Type of occupation:……

8. Who is in charge of collecting your waste?	
Local Authority	
Private Waste Collector	
Personal Disposal	
9. Which type of the following facilities do you use?	
One Bin collection/Wheelie bin/Plastic Bag	
Recycling bin collection/Green bin	
BringBanks e.g. Bottle banks, clothes banks	
Civic sites – recycling centres for disposal of items i.e.fridges	
Brown bin/composting service	
Household hazardous waste collection e.g. Paint	
Landfill site	
Occasional bulky item collection	

Education and awareness

Instructions:For each of the following statements, tick (✓) the one out of the 4 – point scale that best describes how the statement applies to you.

10. I have attended some training programme on waste management	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**
11. I have received some education on waste management for employee	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**
12. I have attended some programme on recycling before	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**
13. I have attended training programme on waste management	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**

Culture belief, attitude andbehavior to waste

Instructions:For each of the following statements, tick (✓) the one out of the 4 – point scale that best describes how the statement applies to you.

14. I have a good knowledge of the customs and rituals of my culture or ethnic group.	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**
15. My customs or culture or ethnic group forbid using the hand to touch waste	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**
16. it is cultural to sweep and keep the environment clean	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**
17. My culture forbid that I throw away waste at night	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**
18. Some cultures are very poor in terms of managing solid waste	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**
19. Keeping used things in the house is highly forbidden in my culture	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**
20. I don't like mixing with people with dirty culture	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**
21. Leaders from my community p[reach against dirty surroundings and behavior	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**

SECTION C: GOVERNMENTAL FACTOR SCALE

Instructions: Read each statement carefully and give the right answers to these statements. Please, indicate how much you agree/disagree for each of the following statements. For each of the following statements, tick (✓) the one out of the 4 – point scale that best describes how the statement applies to you.

Environmental policy formulation/Implementation and implementation

1. I am aware of government laws and programme guiding waste management practices in the state	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**
2. Government have not been consistent in implementing laws regarding poor waste disposal	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**
3. Health officers are empowered to arrest people who violates environmental laws in my area and keep the environment clean	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly agree ( )**

4. Health officers enforce government environmental laws in the area where we live	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
5. I often watch documentary and government programmes on waste management	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
6. The participation of private organisation in waste management is very wrong	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
7. I support government activitiesregarding waste management practices in the state	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )

Advocacy

8. I believe the government is not doing enough to educate the people about the city's garbage problem.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
9. I believed that correct garbage management should be taught in schools.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
10. There is more information on crime, unemployment, and cost of living than living in a garbage-free community.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
11. Public education about proper garbage management is one way to fix the garbage crisis	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
12. I attend public lectures and symposium on waste management and disposal	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
13. Government spend high amount on information dissemination on waste management	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
14. I am aware that the government have held several workshop on waste management for the area	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )

Delineation of dumping site

15. We have a government - built designated waste bins in my area	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
16. The government have provided land fill for waste management in the area	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
17. People dump their waste anywhere because government have not provided a waste bin in my area	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
18. Waste management authority regularly collect waste from the designated waste dump in my area	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )

19. There is a public incinerator to burn our waste in my area — **Strongly disagree ( )** **disagree ( )** **Agree ( )** **Strongly agree ( )**

Provision of bins/transportation facilities

20. There is adequate provision of waste bin and dumping sites in my area — **Strongly disagree ( )** **disagree ( )** **Agree ( )** **Strongly agree ( )**
21. The government waste bin is far from my house — **Strongly disagree ( )** **disagree ( )** **Agree ( )** **Strongly agree ( )**
22. I have never seen any waste bin around my area — **Strongly disagree ( )** **disagree ( )** **Agree ( )** **Strongly agree ( )**
23. The government waste truck collects waste from my area frequently — **Strongly disagree ( )** **disagree ( )** **Agree ( )** **Strongly agree ( )**
24. There is a licensed waste truck which visit my area regularly — **Strongly disagree ( )** **disagree ( )** **Agree ( )** **Strongly agree ( )**
25. The amount collected by private waste truck is reasonable and economical — **Strongly disagree ( )** **disagree ( )** **Agree ( )** **Strongly agree ( )**

SECTION D :SOLID WASTEMANAGEMENT BEHAVIOUR INVENTORY

Instructions: Read each statement carefully and give the right answer to these statements. Please, indicate how much you agree/disagree for each of the following statements.

Please describe how your organization gets rid of the following types of garbage						
	Food/Biological Waste	Plants /Flower/Trees	Paper	Old furniture	Metals/packaging	Glass
1. Burn						
2. Bury						
3. Dump in River/Gully						
4. Dump in organisation dump yard						
5. Dump on the road						
6. Dump at dump site						
7. Garbage Truck						
8. Recycle						
9. Reuse						
10. Compost						
11. More than one method						
12. Other						
13. No Response						

14. How much litter is visible in your community?
    a. Virtually no visible litter [ ]
    b. Upon careful inspection a small amount of litter is obvious [ ]
    c. Visible litter can be seen throughout the area, likely requiring in an organized clean-up [ ]
    d. Major illegal dumpsites are present, likely requiring equipment or extra manpower for removal [ ]
    e. DON'T KNOW [ ]
    f. REFUSED [ ]

15. How clean is the area?
    a. Very clean [ ]
    b. Somewhat clean [ ]
    c. Not very clean [ ]
    d. Not clean at all [ ]
    e. DON'T KNOW [ ]
    f. REFUSED [ ]

16. How well maintained is your area
    a. Very well maintained [ ]
    b. Somewhat maintained [ ]
    c. Not very well maintained [ ]
    d. Not at all maintained [ ]
    e. DON'T KNOW [ ]
    f. REFUSED [ ]

Instructions: Read each statement carefully and give the right answers to these statements. For each of the following statements, tick (✓) the one out of the 4 – point scale that best describes how the statement applies to you.

1.	I put dead batteries in the garbage.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
2.	After meals, I dispose of leftovers properly	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
3.	I bring unused medicine back to the pharmacy.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
4.	I collect and recycle used paper.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
5.	I bring empty bottles to a recycling bin.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
6.	I engage in composting?	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly agree** ( )
7.	I often engage in recycling	**Strongly disagree**	**disagree**	**Agree**	**Strongly agree**

	( )	( )	( )	( )
8. I am willing to separate waste material into separate bags for collection purposes	**Strongly disagree**	**disagree**	**Agree**	**Strongly agree**
	( )	( )	( )	( )
9. I am willing to pay for disposal of recycled materials	**Strongly disagree**	**disagree**	**Agree**	**Strongly agree**
	( )	( )	( )	( )
10. I am willing to participate in a program to compost food and yard waste	**Strongly disagree**	**disagree**	**Agree**	**Strongly agree**
	( )	( )	( )	( )
11. I am willing to purchase less throwaway products (such as, plastic bottles) to help reduce the amount of garbage to get rid of	**Strongly disagree**	**disagree**	**Agree**	**Strongly agree**
	( )	( )	( )	( )
12. If a waste dump in located in my community, I am willing to carry my garbage to it?	**Strongly disagree**	**disagree**	**Agree**	**Strongly agree**
	( )	( )	( )	( )
13. I amwillingto participate in building the waste dump for my community?	**Strongly disagree**	**disagree**	**Agree**	**Strongly agree**
	( )	( )	( )	( )
14. I amwillingto participate in the maintenance of waste dump?	**Strongly disagree**	**disagree**	**Agree**	**Strongly agree**
	( )	( )	( )	( )
15. I can afford organic food	**Strongly disagree**	**disagree**	**Agree**	**Strongly agree**
	( )	( )	( )	( )

APPENDIX B

DEPARTMENT OF ADULT EDUCATION
FACULTY OF EDUCATION
UNIVERSITY OF IBADAN
IBADAN

COMMERCIAL/INDUSTRIAL UNITS WASTE MANAGEMENT QUESTIONNAIRE

Dear respondent,

This questionnaire seeks to obtain information on "*Psychosocial and Government Activities as determinant of Waste Management in South Western Nigeria"*a Ph D. research in the Department of Adult Education, Faculty of Education, University of Ibadan, Ibadan.

You are therefore implored to please respond to all questions objectively and sincerely. All information shall be treated in strict confidence as it is for the purpose of this

BIODATA

1. **Sex**: (a) Male ( ) (b) Female ( )
2. ***Age***: (a) 20-29 ( ) (b) 30-39 ( ) (c) 40-49 ( ) (d) 50 and above ( )
3. Job designation: ……
4. Location:……

SECTION A: PSYCHOLOGICAL FACTOR SCALE

Instructions: Read each statement carefully and give the right answers to these statements. Please, indicate how much you agree/disagree for each of the following statements. For each of the following statements, tick (✓) the one out of the 4 – point scale that best describes how the statement applies to you.

Attitudinal disposition

1.	the cleanliness of the organisation is the responsibility of every staff of my organisation	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly disagree ( )**
2.	Members of the organisation do not care about the environment	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly disagree ( )**
3.	my organisation supports waste burning	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly disagree ( )**
4.	My organisation love to reduce the amount of waste generated	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**

	( )	( )	( )	( )
5. we like participating in waste management activities in my organisation	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**
	( )	( )	( )	( )
6. my organisation send staff to attend any training, seminar, or workshop on environmental education/ management?	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**
	( )	( )	( )	( )
7. My organisation read about household products that are better for the environment.	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**
	( )	( )	( )	( )
8. my organisation actively seek information on how to reuse or recycle something rather than throw it away	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**
	( )	( )	( )	( )
9. My organisation emphasise reduction in waste generation for environmental reasons.	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**
	( )	( )	( )	( )
10. My organisation is part of meetings where a signed letter/petition was issued to protect the environment.				
11. My organisation associates with the organizations responsible for environmental protection	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**
	( )	( )	( )	( )
12. The leaders of the organisation doesn't like dirty environment	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**
	( )	( )	( )	( )
Environmental and neighbourhood affection/concerns				
13. My organisation concerned with maintaining a good environment for work	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**
	( )	( )	( )	( )
14. My organisation have strong interest in the health and seeks the well-being of the community in the area which it is located	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**
	( )	( )	( )	( )
15. My organisation emphasise the natural look of the environment	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**
	( )	( )	( )	( )
16. People like working and doing business with my organisation because it is neat and quiet	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**
	( )	( )	( )	( )
Aesthetic value for the environment				
17. leaders in my organization gives special attention to aesthetic values of the work environment	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**
	( )	( )	( )	( )
18. My organisation promotes beautiful and good environment	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**
	( )	( )	( )	( )
19. My organisation don't like poor dirty environment	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**
	( )	( )	( )	( )

20. Leaders in the organisation can rarely tell with certainty if something ugly or beautiful.	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly disagree ( )**
21. my organization is adorn with flowers and trees	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly disagree ( )**
22. my organization have recreation centres and cafeteria	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly disagree ( )**
23. My organisation organize visit museum to see beautiful sights	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly disagree ( )**
24. Unwholesome dirty environment irritates the management	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly disagree ( )**

SECTION B: SOCIAL FACTORS SCALE

1. Highest qualification: (a) Secondary school certificate ( ) (b) Teachers training/Technical ( ) (c) ONDNCE ( ) (d) HND ( ) (g) BSc ( ) (h) Masters/Phd (i) Others specify……
2. Organisational size (a) 50 – 100 ( ) (b) 101 – 150 ( ) (c) 151 – 200( ) (d) Above 200 ( )
3. Type of organisation : (a) manufacturing ( ) (b) marketing/distribution( ) (c) service provider ( )
4. Ownership (a) Public ( ) (b) Private ( )

Knowledge and Awareness

Instructions: Read each statement carefully and give the right answers to these statements. Please, indicate how much you agree/disagree for each of the following statements. For each of the following statements, tick (✓) the one out of the 4 – point scale that best describes how the statement applies to you.

9. My organisation send staff for some training programme on waste management	**Strongly disagree** ( )	**Disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
10. My organisation send staff for some education on waste management for employee	**Strongly disagree** ( )	**Disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
11. My organisation send staff for some education programme on recycling	**Strongly disagree** ( )	**Disagree** ( )	**Agree** ( )	**Strongly disagree** ( )

SECTION C: GOVERNMENTAL FACTOR SCALE

Instructions: Read each statement carefully and give the right answers to these statements. Please, indicate how much you agree/disagree for each of the following statements. For each of the following statements, tick (✓) the one out of the 4 – point scale that best describes how the statement applies to you.

Environmental policy and formulation and implementation

1. Government should make laws that favours organisation on waste management issues in the country	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
2. Government have not been consistent in implementing laws regarding industrial waste	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
3. Government often sanction organisations who violates environmental laws in my organisation	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )

4. Government is advocating a strong policy on waste management practices in my state	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
5. my organisation monitors documentary and government programmes on waste management	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
6. The process of establishment of waste management laws in Nigeria is wrong	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
7. It is very important that Government should effect laws on recycling and industrial waste management.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
8. my organisation often have problems with waste management regulatory agencies	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
9. my organisation have been sanctioned for poor compliance with waste management laws	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
10. my organisation cannot achieved the set goals for waste management	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
11. government policies on waste not attainable	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
12. my organisation makes effort to comply with policies on waste management	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )

Advocacy

13. My organisation believe that the government is not doing enough to educate the people about the city's garbage problem.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
14. My organisation believes that correct waste management should be part of school curriculum.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
15. There is more information on crime, unemployment, and cost of living than living in a waste-free community.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
16. Public education about proper garbage management is one way to fix the garbage crisis	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
17. My organisation send staff to participate in public lectures and symposium on waste management and disposal	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
18. Government spend high amount on information dissemination on waste management	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
19. I am aware that the government have held several workshop on waste management	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**

( ) ( ) ( ) ( )

Dealianation of dumping site

20. My organisation have a government- built designated waste bins	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
21. The government have provided land fill for waste management in the area	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
22. Organisations dump their waste anywhere because government have not provided a waste bin in my organisation	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
23. Waste management authority regularly collect waste from the designated waste dump in my organisation	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )

Provision of bins/transportation facilities

24. There is adequate provision of waste bin and dumping site for our organization	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
25. Waste bins are available in the organisation	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
26. employees in this organization have never seen any waste bin around the area	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
27. The government waste truck collects waste from the organisation frequently	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
28. There is a licensed waste truck which visit the organisation regularly	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
29. The amount collected by private waste truck is reasonable and economical	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )

SECTION D: SOLID WASTE MANAGEMENT BEHAVIOUR INVENTORY

Instructions: Read each statement carefully and give the right answer to these statements. Please, indicate how much you agree/disagree for each of the following statements.

Please describe how organization gets rid of the following types of garbage						
	BIOLOGICAL WASTE	PLANTS /FLOWER/TREES	HAZARDOUS CHEMICALS	INDUSTRIAL WASTE	METALS/PACKAGING	GLASS/ PHYTOCHEMICALS
1. Burn						
2. Bury						
3. Dump in River/Gully						

4. Dump in organisation dump yard						
5. Dump on the road						
6. Dump at dump site						
7. Garbage Truck						
8. Recycle						
9. Reuse						
10. Compost						
11. More than one method						
12. Other						
13. No Response						

14. How much litter is visible in your industrial community?
    a. Virtually no visible litter [ ]
    b. Upon careful inspection a small amount of litter is obvious [ ]
    c. Visible litter can be seen throughout the area, likely requiring in an organized clean-up [ ]
    d. Major illegal dumpsites are present, likely requiring equipment or extra manpower for removal [ ]
    e. DON'T KNOW [ ]
    f. REFUSED [ ]

1. How clean is the industrial area?
    a. Very clean [ ]
    b. Somewhat clean [ ]
    c. Not very clean [ ]
    d. Not clean at all [ ]
    e. DON'T KNOW [ ]
    f. REFUSED [ ]

2. How well maintained is your industrial area
    a. Very well maintained [ ]
    b. Somewhat maintained [ ]
    c. Not very well maintained [ ]
    d. Not at all maintained [ ]
    e. DON'T KNOW [ ]
    f. REFUSED [ ]

Instructions: Read each statement carefully and give the right answer to these statements. Please, indicate how much you agree/disagree for each of the following statements. For each of the following statements, tick (✓) the one out of the 4 – point scale that best describes how the statement applies to you.

	Strongly disagree	**disagree**	**Agree**	**Strongly disagree**
17. My organisation put dead batteries in the garbage.				

	( )	( )	( )	( )
18. My organisation collect and recycle used paper.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
19. My organisation put empty bottles in recycling bin.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
20. My organisation engages in composting and recycling	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
21. My organisation is willing to separate these into separate bags for collection purposes?	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
22. My organisation is willing to pay for pickup of waste materials from their premises	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
23. My organisation is willing to participate in a recycling programmes	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
24. My organisation have a stated policy on waste	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
25. My organisation is willing to participate in building the waste dump for the community?	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
26. My organisation is willingto participate in the maintenance of waste dump site?	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
27. My organisation engages in composting?	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
28. my organisation is ISO compliant				

APPENDIX C

DEPARTMENT OF ADULT EDUCATION
FACULTY OF EDUCATION
UNIVERSITY OF IBADAN
IBADAN

INSTITUTIONAL UNITS WASTE MANAGEMENT

Dear respondent,
This questionnaire seeks to obtain information on "*Psychosocial and Government Activities as determinant of Waste Management in South Western Nigeria"*a Ph D. research in the Department of Adult Education, Faculty of Education, University of Ibadan, Ibadan.
You are therefore implored to please respond to all questions objectively and sincerely. All information shall be treated in strict confidence as it is for the purpose of this research only.

BIO DATA

1. **Sex**: (a) Male ( ) (b) Female ( )
2. ***Age***: (a) 20-29 ( ) (b) 30-39 ( ) (c) 40-49 ( ) (d) 50 and above ( )
3. Job designation: ……
4. Location:……

SECTION A :PSYCHOLOGICAL FACTORS SCALE

Instructions: Read each statement carefully and give the right answers to these statements. Please, indicate how much you agree/disagree for each of the following statements. For each of the following statements, tick (✓) the one out of the 4 – point scale that best describes how the statement applies to you.

Attitudinal disposition

1.	the cleanliness of the organisation is the responsibility of every staff of my organisation	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly disagree ( )**
2.	Members of the organisation do not care about the environment	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly disagree ( )**
3.	my organisation supports waste burning	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly disagree ( )**
4.	My organisation love to reduce the amount of waste generated	**Strongly disagree ( )**	**disagree ( )**	**Agree ( )**	**Strongly disagree ( )**
5.	we like participating in waste management	**Strongly**	**disagree**	**Agree**	**Strongly**

	activities in my organisation	**disagree** ( )	( )	( )	**disagree** ( )
6.	my organisation send staff to attend any training, seminar, or workshop on environmental education/ management?	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
7.	My organisation read about household products that are better for the environment.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
8.	my organisation actively seek information on how to reuse or recycle something rather than throw it away	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
9.	My organisation emphasise reduction in waste generation for environmental reasons.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
10.	My organisation is part of meetings where a signed letter/petition was issued to protect the environment.				
11.	My organisation associates with the organizations responsible for environmental protection	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
12.	The leaders of the organisation doesn't like dirty environment	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
Environmental and neighbourhood affection/concerns					
13.	My organisation concerned with maintaining a good environment for work	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
14.	My organisation have strong interest in the health and seeks the well-being of the community in the area which it is located	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
15.	My organisation emphasise the natural look of the environment	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
16.	People like working and doing business with my organisation because it is neat and quiet	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
Aesthetic value for the environment					
17.	leaders in my organization gives special attention to aesthetic values of the work environment	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
18.	My organisation promotes beautiful and good environment	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
19.	My organisation don't like poor dirty environment	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
20.	Leaders in the organisation can rarely tell with certainty if something ugly or beautiful.	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**

21. my organization is adorn with flowers and trees	**( ) Strongly disagree**	**( ) disagree**	**( ) Agree**	**( ) Strongly disagree**
22. my organization have recreation centres and cafeteria	**( ) Strongly disagree**	**( ) disagree**	**( ) Agree**	**( ) Strongly disagree**
23. My organisation organize visit museum to see beautiful sights	**( ) Strongly disagree**	**( ) disagree**	**( ) Agree**	**( ) Strongly disagree**
24. Unwholesome dirty environment irritates the management	**( ) Strongly disagree**	**( ) disagree**	**( ) Agree**	**( ) Strongly disagree**

SECTION B: SOCIAL FACTORS SCALE

1. Highest qualification: (a) Secondary school certificate ( ) (b) Teachers training/Technical ( ) (c) ONDNCE ( ) (d) HND ( ) (g) BSc ( ) (h) Masters/Phd (i) Others specify……
2. Type of organisation : (a) Primary /Secondary School ( ) (b) Church/Mosque /Religious institution ( ) (c) Tertiary educational institution ( ) (d) Govt office ( )
3. Student/congregational population (a) 1 – 100 ( ) (b) 101 – 500 ( ) (c) 501 – 1000( ) (d) 1001 - 5000 ( ) (e) 5001 – 10000 ( )
4. Ownership (a) Public ( ) (b) Private ( )

Instructions: Read each statement carefully and give the right answers to these statements. Please, indicate how much you agree/disagree for each of the following statements. For each of the following statements, tick (✓) the one out of the 4 – point scale that best describes how the statement applies to you.

5. My organisation send staff for some training programme on waste management	**Strongly disagree ( )**	**Disagree ( )**	**Agree ( )**	**Strongly disagree ( )**
6. My organisation send staff for some education on waste management for employee	**Strongly disagree ( )**	**Disagree ( )**	**Agree ( )**	**Strongly disagree ( )**
7. My organisation send staff for some education programme on recycling	**Strongly disagree ( )**	**Disagree ( )**	**Agree ( )**	**Strongly disagree ( )**

SECTION C: GOVERNMENTAL FACTOR SCALE

Instructions: Read each statement carefully and give the right answers to these statements. Please, indicate how much you agree/disagree for each of the following statements. For each of the following statements, tick (✓) the one out of the 4 – point scale that best describes how the statement applies to you.

Environmental policy and formulation and implementation

1. Government should make laws that favours organisation on waste management issues in the country	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
2. Government have not been consistent in implementing laws regarding industrial waste	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
3. Government often sanction organisations who violates environmental laws in my organisation	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
4. Government is advocating a strong policy on waste management practices in my state	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
5. my organisation monitors documentary and government programmes on waste management	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
6. The process of establishment of waste management laws in Nigeria is wrong	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
7. It is very important that Government should effect laws on recycling and industrial waste management.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
8. my organisation often have problems with waste management regulatory agencies	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
9. my organisation have been sanctioned for poor compliance with waste management laws	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
10. my organisation cannot achieved the set goals for waste management	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
11. government policies on waste not attainable	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
12. my organisation makes effort to comply with policies on waste management	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )

Advocacy

13. My organisation believe that the government is not doing enough to educate the people	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**

about the city's garbage problem.	( )	( )	( )	( )
14. My organisation believes that correct waste management should be part of school curriculum.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
15. There is more information on crime, unemployment, and cost of living than living in a waste-free community.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
16. Public education about proper garbage management is one way to fix the garbage crisis	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
17. My organisation send staff to participate in public lectures and symposium on waste management and disposal	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
18. Government spend high amount on information dissemination on waste management	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
19. I am aware that the government have held several workshop on waste management	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
Dealianation of dumping site				
20. My organisation have a government- built designated waste bins	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
21. The government have provided land fill for waste management in the area	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
22. Organisations dump their waste anywhere because government have not provided a waste bin in my organisation	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
23. Waste management authority regularly collect waste from the designated waste dump in my organisation	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
Provision of bins/transportation facilities				
24. There is adequate provision of waste bin and dumping site for our organization	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
25. Waste bins are available in the organisation	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
26. employees in this organization have never seen any waste bin around the area	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
27. The government waste truck collects waste from the organisation frequently	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
28. There is a licensed waste truck which visit the organisation regularly	**Strongly disagree**	**disagree**	**Agree**	**Strongly disagree**

29. The amount collected by private waste truck is reasonable and economical	**( ) Strongly disagree**	**( ) disagree**	**( ) Agree**	**( ) Strongly disagree**

( ) ( ) ( ) ( )

SECTION D : SOLID WASTEMANAGEMENT BEHAVIOUR INVENTORY

Instructions: Read each statement carefully and give the right answer to these statements. Please, indicate how much you agree/disagree for each of the following statements.

Please describe how your organization gets rid of the following types of garbage						
	BIOLOGICAL WASTE	PLANTS /FLOWER/TREES	PAPER	OLD FURNITURES	METALS/PACKAGING	GLASS
17. Burn						
18. Bury						
19. Dump in River/Gully						
20. Dump in organisation dump yard						
21. Dump on the road						
22. Dump at dump site						
23. Garbage Truck						
24. Recycle						
25. Reuse						
26. Compost						
27. More than one method						
28. Other						
29. No Response						

30. How much litter is visible in your industrial community?
   g. Virtually no visible litter [ ]
   h. Upon careful inspection a small amount of litter is obvious [ ]
   i. Visible litter can be seen throughout the area, likely requiring in an organized clean-up [ ]
   j. Major illegal dumpsites are present, likely requiring equipment or extra manpower for removal [ ]
   k. DON'T KNOW [ ]
   l. REFUSED [ ]

31. How clean is the industrial area?
   g. Very clean [ ]
   h. Somewhat clean [ ]
   i. Not very clean [ ]
   j. Not clean at all [ ]
   k. DON'T KNOW [ ]
   l. REFUSED [ ]

32. How well maintained is your industrial area
   g. Very well maintained [ ]

h. Somewhat maintained [ ]
i. Not very well maintained [ ]
j. Not at all maintained [ ]
k. DON'T KNOW [ ]
l. REFUSED [ ]

Instructions: Read each statement carefully and give the right answer to these statements. Please, indicate how much you agree/disagree for each of the following statements. For each of the following statements, tick (✓) the one out of the 4 – point scale that best describes how the statement applies to you.

24. My organisation put dead batteries in the garbage.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
25. My organisation collect and recycle used paper.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
26. My organisation put empty bottles in recycling bin.	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
27. My organisation engages in composting and recycling	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
28. My organisation is willing to separate these into separate bags for collection purposes?	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
29. My organisation is willing to pay for pickup of waste materials from their premises	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
30. My organisation is willing to participate in a recycling programmes	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
31. My organisation have a stated policy on waste	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
32. My organisation is willing to participate in building the waste dump for the community?	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
33. My organisation is willingto participate in the maintenance of waste dump site?	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
34. My organisation engages in composting?	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )
35. my organisation is ISO compliant	**Strongly disagree** ( )	**disagree** ( )	**Agree** ( )	**Strongly disagree** ( )

APPENDIX D

Mean weight average comparison of the impact of Psychological factors on household waste management behaviour

	Average waste management behaviour		
ATTITUDINAL_DISPOSITION			
POOR	33.1038	23.07754	1840
GOOD	39.4744	20.86622	624
AESTHETIC_VALUE			
LOW	34.1562	22.23287	2062
HIGH	37.5945	24.81025	402
ENVIRONMENTAL NEIGHBOURHOO			
POOR	31.0749	19.20898	2037
GOOD	35.4806	23.30213	427

APPENDIX E

Mean weight average comparison of the impact of social factors on household waste management behaviour

	Average waste management behaviour		
Gender	Mean	Std. Deviation	N
Male	32.3798	23.37439	1061
Female	36.4847	22.02713	1403
Age			
20-29	43.4363	22.34228	871
30-39	30.4971	22.52309	1042
40-49	27.6039	18.84382	467
50 and above	36.2024	19.97998	84
MARITAL STATUS			
Single	39.6518	23.76706	1054
Married	30.4886	21.11131	1355
Divorced	45.4681	15.58825	47
Widowed	37.6250	25.97217	8
RELIGION			
Christianity	33.0374	22.50057	1578
Islam	37.6026	22.87028	853
Others	40.4545	20.07033	33
ETHNIC			
Yoruba	34.8816	23.14610	1993
Ibo	32.8392	15.59238	311
Hausa	35.5345	28.82011	116
Niger delta and Edo	38.3864	26.26362	44
EMPLOYMENT			
Employed	29.5246	21.33099	1464
Unemployed	37.2438	22.17581	283
Student	44.2271	22.46593	665
Retired	45.5385	21.03355	52
INCOME			
No Income	29.4390	15.60986	815
Less than N 10000	24.6457	21.13919	383
N 10001 to N 30000	25.4367	16.92186	724
N 30001 to 49999	30.5455	7.84045	246
N 50000 to N 69999	33.0470	22.09873	127
N 70000 to N 89999	34.2942	23.18470	158
N 90000 or more	40.8957	23.95122	11
CULTURE_BELIEF_SYSTEM			
POOR	35.2661	22.93843	2281
GOOD	27.8743	18.25312	183

APPENDIX F

Mean weight average comparison of the impact of Government Activities on household waste management behaviour

Average waste management behaviour			
ENVIRONMENTAL POLICY			
POOR	31.5829	22.47366	697
GOOD	42.6628	21.31650	1767
ADVOCACY			
LOW	34.3367	23.01765	2058
HIGH	36.6453	20.96057	406
DEALINEATION OF DUMPING SITES			
LOW	27.9387	23.53466	1730
HIGH	37.5931	21.71823	734
PROVISION OF TRANSPORTATION FACILITIES			
LOW	27.9104	22.20912	1404
HIGH	39.8561	21.70608	1060

APPENDIX G

Mean Weight comparison of the Impact of Psychological Factors on Industrial Waste Management Behaviour

PSYCHOLOGICAL VARIABLES			
ATTITUDINALDISPOSITION	Mean	S.D	N
LOW	**67.0698**	**14.19842**	**86**
HIGH	**71.2277**	**13.62394**	**224**
AESTHETIC VALUE			
LOW	**67.0698**	**14.19842**	**86**
HIGH	**71.2277**	**13.62394**	**224**
ENVIRONMENTAL NEIGHBOURHOOD			
LOW	**68.4444**	**15.25247**	**63**
HIGH	**70.4899**	**13.52019**	**247**

APPENDIX H

Mean Weight comparison of the Impact of Social Factors on Industrial Waste Management Behaviour

SOCIAL FACTORS			
EDUCATION AWARENESS	Mean	S.D	N
LOW	66.7576	13.24872	132
HIGH	72.5337	13.87562	178
ORGANIZATIONAL SIZE			
1 – 100	71.0368	14.23389	163
101 – 500	69.1429	13.47622	28
501 – 1000	69.3256	13.89747	86
1001 – 5000	66.0400	11.42176	25
5001 – 10000	74.3750	14.87988	8
HIGHEST QUALIFICATION OFFICER			
Primary/secondary school	71.0377	14.20122	106
church/mosque/religion institution	66.7115	14.20493	104
tertiary educational institution	75.4651	8.57279	43
Govt office	70.3509	14.65495	57
TYPE OF ORGANISATION			
Manufacturing	69.9721	15.29245	215
marketing/distribution	70.3053	10.07849	95
OWNERSHIP			
Public	68.8471	12.99932	170
Private	71.5643	14.80726	140

APPENDIX I

Mean Weight comparison of the Impact of Government Activities on Industrial Waste Management Behaviour

GOVERNMENT ACTIVITIES			
ADVOCACY	Mean	S.D	N
LOW	**69.3521**	**15.60778**	**71**
HIGH	**70.2887**	**13.36323**	**239**
DEALIANATIONDUMPINGSITE			
LOW	**69.4530**	**14.63988**	**234**
HIGH	**71.9868**	**11.13253**	**76**
ENVIRONMENTAL			
LOW	**68.4444**	**15.25247**	**63**
HIGH	**70.4899**	**13.52019**	**247**
PROVISIONBINSTRANSPORTATION			
LOW	**65.7111**	**10.53484**	**45**
HIGH	**70.8151**	**14.26427**	**265**

APPENDIX J

Mean Weight comparison of the Impact of Psychological Factors on Institutional waste management behaviour

	PSYCHOLOGICAL VARIABLES		
ATTITUDINALDISPOSITION	Mean	S.D	N
POOR	66.95	12.39	127
GOOD	73.75	12.45	243
AESTHETIC VALUE			
LOW	69.72	12.10	200
HIGH	73.41	13.38	170
ENVIRONMENTAL NEIGHBOURHOOD			
POOR	60.29	15.91	7
GOOD	71.63	12.69	363

APPENDIX K

Mean Weight comparison of the Impact of Social Factors on Institutional waste management behaviour

SOCIAL FACTORS			
EDUCATION AWARENESS	Mean	S.D	N
POOR	61.8286	12.66650	35
GOOD	72.4179	12.43973	335
HIGHEST QUALIFICATION OFFICER			
Secondary school certificate	74.3878	15.31178	49
teachers training /technical	77.3158	8.36031	19
OND/NCE	67.5106	13.70326	94
HND	73.0864	11.65354	81
BSc	67.2308	11.26441	52
Masters/Phd	69.3333	10.95228	15
Others	75.1333	11.00457	60
HIGHEST QUALIFICATION OFFICER			
Primary/secondary school	71.0377	14.20122	106
church/mosque/religion institution	66.7115	14.20493	104
tertiary educational institution	75.4651	8.57279	43
Government office	70.3509	14.65495	57
ORGANISATIONAL SIZE			
50 – 200	71.1878	12.22934	229
201 – 1000	71.4375	13.39139	112
1001 – 2001	70.4737	14.56544	19
above 2001	78.2000	16.26721	10
TYPE OF ORGANIZATION			

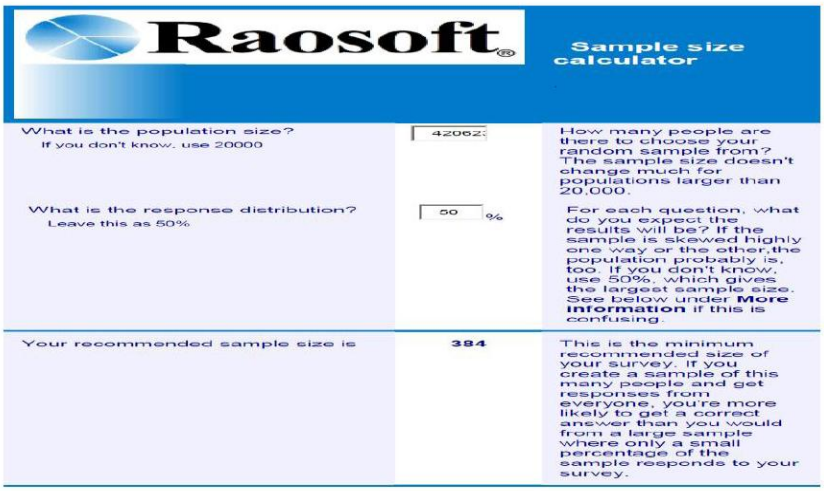
School	70.7418	13.49996	213
government office	73.9231	10.86609	78
religious place	70.7595	12.58022	79
OWNERSHIP			
Public	71.8565	12.57657	216
Private	70.7987	13.18217	154

APPENDIX L

Mean Weight comparison of the Impact of Government Activities on Institutional waste management behaviour

	GOVERNMENT ACTIVITIES		
ADVOCACY	Mean	S.D	N
LOW	**68.2388**	**14.49565**	**67**
HIGH	**72.1188**	**12.34168**	**303**
DEALIANATIONDUMPINGSITE			
LOW	**68.7200**	**12.00425**	**200**
HIGH	**745882**	**13.06633**	**170**
ENVIRONMENTAL			
POOR	**69.7556**	**12.27026**	**135**
GOOD	**72.3702**	**13.06342**	**235**
PROVISIONBINSTRANSPORTATION			
LOW	**60.8400**	**11.27642**	**50**
HIGH	**73.0688**	**12.26618**	**320**

APPENDIX M
RAOSOFT ONLINE SAMPLE SIZE CALCULATOR



More information

If 50% of all the people in a population of 20000 people drink coffee in the morning, and if you were repeat the survey of 377 people ("Did you drink coffee this morning?") many times, then 95% of the time, your survey would find that between 45% and 55% of the people in your sample answered "Yes".

The remaining 5% of the time, or for 1 in 20 survey questions, you would expect the survey response to more than the margin of error away from the true answer.

When you survey a sample of the population, you don't know that you've found the correct answer, but you do know that there's a 95% chance that you're within the margin of error of the correct answer.

Try changing your sample size and watch what happens to the *alternate scenarios*. That tells you what happens if you don't use the recommended sample size, and how M.O.E and confidence level (that 95%) are related.

To learn more if you're a beginner, read **Basic Statistics: A Modern Approach** and **The Cartoon Guide to Statistics**. Otherwise, look at the **more advanced books**.

In terms of the numbers you selected above, the sample size n and margin of error E are given by

$$x = Z(^{c}/_{100})^{2} r(100-r)$$

$$n = {}^{Nx}/_{((N-1)E^{2} + x)}$$

$$E = \mathrm{Sqrt}[{}^{(N-n)x}/_{n(N-1)}]$$

where N is the population size, r is the fraction of responses that you are interested in, and $Z(c/100)$ is the critical value for the confidence level c.

If you'd like to see how we perform the calculation, view the page source. This calculation is based on the Normal distribution, and assumes you have more than about 30 samples.

About **Response distribution**: If you ask a random sample of 10 people if they like donuts, and 9 of them say, "Yes", then the prediction that you make about the general population is different than it would be if 5 had said, "Yes", and 5 had said, "No". Setting the response distribution to 50% is the most conservative assumption. So just leave it at 50% unless you know what you're doing. The sample size calculator computes the critical value for the normal distribution. Wikipedia has good articles on statistics.

How do you like this web page? Good as-is Could be even better Submit

APPENDIX N

INDEPTH INTERVIEW AND KEY INFORMANT INTERVIEW GUIDE

HOUSEHOLD

Name:

……

……

Area:……

……

How many members do you have in your house?

Adults: _____ Children: _____ Senior Citizens: _____

How many working members live in the household?

Number: _____ Occupations: _____

Please choose the type of housing that you live in:

Independent House:____ Multistoried apartment:____ Others (please specify):_____

Do you have a Municipal Corporation dustbin within 500 metres of your home?

If yes please specify what kind:_____

If no, where do you dump your waste: _____

What factors do you think is responsible for poor waste management behaviour among the residents in your area

What do you think is responsible for the lackadaisical attitude of people towards waste management

Do you segregate your waste at home?

If yes please choose: Papers__ Food items__ Cans/Bottles__ Plastics____ Others----------

After you put out your waste, do you know where the waste goes?

If yes, please specify where:_____

Do you make a financial contribution to the current waste collection system?

If yes please specify how much:_____

Who in your household usually throws out the waste? _____

On an average, how many carrier bags of waste _____ how often _____ do you throw out per week?

Do you reuse any of the following items:

Plastic bags:____ Plastic bottles:____ Paper bags:____Papers_____Others----------

Do you think that waste disposal method is a problem in your neighbourhood?

If yes please specify why:_____

Do you perceive any of these environmental problems in your neighbourhood?

Rubbish heap____ Dirty streets____ Blocked drains____ Rodents____

Flies and Mosquitoes____ Bad Odour----------Others----------

Do you think that the abovementioned problems can be improved?

If yes, how?_____

If no, why not?_____

What one thing do you think would improve your neighbourhood environment?

_____

Would you like to have an opportunity to participate in improving your neighbourhood environment?_____

Institution and Organisation

Type of institution ……

What types of activities generate wastes?

……

Size of organization:……

Do you have a waste management dustbin around the area?

If yes, please specify what type:_____

If no, where do you dump your waste: _____

What factors do you think is responsible for poor waste management behaviour among the residents in your area?

What do you think is responsible for the lackadaisical attitude of organization towards waste management?

Do you segregate your waste at home?

If yes, please choose: Dry__Organic___Biomedical____ Others_____

After dumping your waste, do you know where the it goes?

If yes, please specify where:_____

Do you make a financial contribution to the current waste collection system?

If yes, please specify how much:_____

Who usually throws out the waste? _____

Do you think that waste disposal method is a problem in your neighbourhood?

If yes please specify why:_____

Do you observe any of these environmental problems in your neighbourhood?

Rubbish heap:____ Dirty streets____ Bad odour____Rodents____ Block drains--------

Flies and Mosquitoes____Others _____

Do you think that the above mentioned problems can be improved?

If yes, how?_____

If no, why not?_____

17. What one thing do you think would improve office environment?

_____

19. Would you like to have an opportunity to participate in improving your office environment?_____

20. Comment generally on solid waste management behaviour in South Western Nigeria

21. Compare solid waste management behaviour in South Western Nigeria with those of developed worlds.

Key Informant Interview Guides with Key Stakeholders in the Solid Waste Management Sector of Nigeria

Current initiatives: What waste reduction activities, such as public education and awareness campaigns, or implementation of technological solutions, currently in place in Nigeria?

Does the Government of Nigeria have integrated, comprehensive plan for environmentally-friendly solid waste management? (Reference material)

How is waste reduction (recycling, composting, and source reduction) integrated in the Plan?

What are the targets and goals regarding waste reduction?

What are the objectives for achieving waste reduction in Nigeria?

What is the status of implementation of this objective?

What is the 'programme budget'?

Does it include aspects like education, technical assistance, planning, reporting, and incentives?

How do the public and private agents collaborate on the varying components of solid waste management, i.e. collecting, disposing, financing, and regulating?

What priority is given to developing waste reduction programs, in comparison to developing the collection services and disposal facilities?

Where do the funds originate for operating/maintenance costs and capital investment of new equipment?

What technological and human resources are currently being used for waste reduction practices (recycling, composting, source reduction)?

General Questions:

In terms of waste reduction, what is the most significant factor that influences the success in Nigeria?

What are the current waste reduction initiatives underway by WMA?

What institutional/industrial entities are making strides towards waste reduction in

Nigeria, specifically in regard to recycling, composting, and source reduction?

Household Education:

What is your opinion of the public's level of awareness concerning solid waste management in your homes and communities?

General Questions:

In terms of waste reduction currently and/or in the future, what is the most significant factor that influences the success in Nigeria?

What initiatives are feasible in your opinion regarding recycling, composting, and source reduction, such as economic incentives, taxes, guidelines and regulations?

What else may you want to say about solid waste management behaviour in south Western Nigeria.

PLATES

(a)

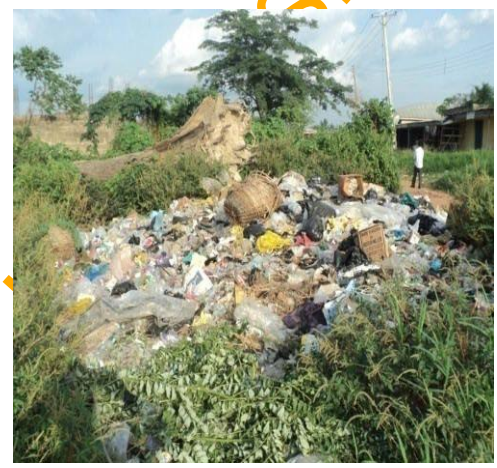
(b)

(c)

(d)

(e)

(f)



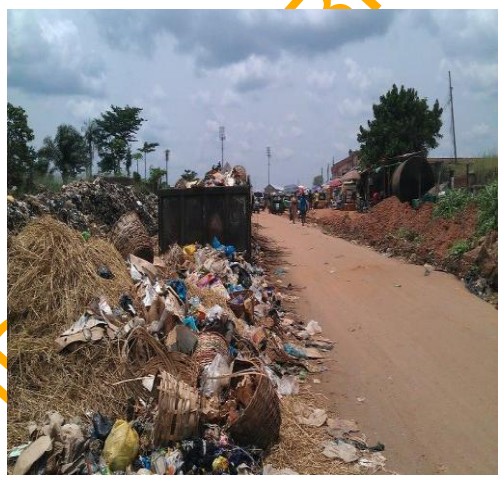
(g)

(h)

(i)

(j)

(k)



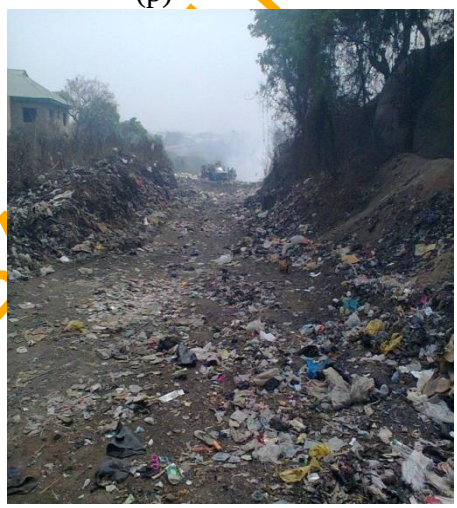
(l)

(m)

(n)

(o)

(p)



(q)

(r)

Plates (a) to (r) Unsustainable Waste Management Behaviour and Practices in Different Parts of the Study Area (Lagos, Abeokuta, Ibadan, Oshogbo, Akure and Ado Ekiti).