USMANU DANFODIYO UNIVERSITY, SOKOTO

POSTGRADUATE SCHOOL

COMMUNITY PARTICIPATION IN SOLID WASTE MANAGEMENT IN KOKO TOWNSHIP, KEBBI STATE

A Dissertation Submitted to the Postgraduate School

USMANU DANFODIYO UNIVERSITY, SOKOTO, NIGERIA

In Partial Fulfillment of the Requirements

For the Award of Degree of

MASTER OF SCIENCE (GEOGRAPHY)

BY

SHU'AIBU, Aliyu

ADM NO: 11210205558

DEPARTMENT OF GEOGRAPHY

JANUARY, 2018

CERTIFICATION

This dissertation by SHU'AIBU, Aliyu (Adm. No. 11210205558) has met the requirements for the award of the Degree of Master of Science (Geography), Usmanu Danfodiyo University, Sokoto, and is approved for its contribution to knowledge.

_____ _____

External Examiner Date

_____ _____

Dr. I. A. Adamu Date

Supervisor

_____ _____

Dr. N. B. Eniolorunda Date

Co-Supervisor I

_____ _____

Dr. I. M. Kirfi Date

Co-Supervisor II

_____ _____

Dr. I. A. Adamu Date

Head of Department

DEDICATTION

I dedicate this research to my late parents (Malam Shu'aibu Adamu and Hajiya Hafsatu Muhammadu)

ACKNOWLEGMENTS

All praise is for Allah, Lord of all exists. I wish to express my kind appreciation and thankfulness to my major supervisor, Dr. A. Oppon-Kumi for his endurance, support, assistance and admirable counsels that facilitated the achievement of this research. My kind appreciation and thankfulness goes to my co-supervisor I, Dr. I. A. Adamu and my co-supervisor II, Dr. I. M. Kirfi, for their supportive clarifications and encouragement.

I wish to express my faithful thankfulness to my capable and knowledgeable lecturers in Geography Department: Dr. I. A. Adamu (H.O.D), Prof. M. A. Iliya, Prof. S. A. Yelwa, Dr. A. G. Fada the PG Co-coordinator, Dr. A. Oppon-Kumi, Dr. I. M. Dankani, Dr. S.D. Abubakar, Dr. A. T. Umar, Dr. A. M. Gada, Dr. M. A. Shamaki, Dr. N. B. Eniolorunda, Malam N. Bello, Malam I. Aliyu, Malam A. M. Jibrillah and Malam Y. M. Musa for their progressive and helpful clarifications and observations.

I wish to express my obliged gratitude to Alhaji Auwalu Shuaibu, Malam A. Usman (former registrar UDUS), Malama Jamilatu Abullahi, Muhammadu Aliyu (Late), Muhammadu sani Aliyu, Safiyya Aliyu, Alhaji Liman Dan-Maliki, Alhaji Faruku Alkali, Malam Mamuda Ibrahim, Alhaji Isah Ibrahim, Abdul-Mu'umin Auwal, Fatima Alkali, Zainabu Muhammad, the residents of Koko town who spare their time and experience for responding the questions they (respondents) were asked during interviews and the entire friends and associates for their endurance support and advises.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABREBRIATION

BSEPA……...Bauchi State Environmental Protection Agency

CP……...Community Participation

KBLGA……..Koko-Besse Local Government Authority

KBLGC.....…...Koko-Besse Local Government Council

KUDA……..Kebbi Urban Development Authority

LCPUC…….Ladder of Community Participation in Underdeveloped Countries

LGA……..Local Government Authority

MSW…….Municipal Solid Waste

MSWM……..Municipal Solid Waste Management

NGOs…….Non-Governmental Originations

SWM……..Solid Waste Management

UNEP…….United Nation Environmental Protection

Abstract

Ineffective solid waste management practices cause environmental pollution and spread of a number of varied diseases in communities of cities and large towns in Nigeria. They also result in the proliferation of rodents, pathogens and horrifying flies in residential neighborhoods and nearby environs. Solid waste management is a continuous and ever increasing process in settlements and many attempts are made to alleviate such predicaments. Most of the attempts failed due to lack of partnering and involving community members in managing the waste.

The study assessed the feasibility and practicability of community participation in managing solid waste in Koko township, Kebbi State, Nigeria. Active community participation in solid waste management will not be neglected because proper and sustainable solid waste management process most encompasses active involvement and participation of community. Being that, they are the generators of the waste and also the victims of hazards and problems emanating from solid waste mismanagement; they are ready to accept offers of partnering with government and NGOs to foster effective and sustainable solid waste management in their community. The study sampled 398 residents for interviews and the selection was done using table of random numbers. Findings of the study include: that Koko-Besse Local Government Authority is not capable of managing solid wastes generated in Koko township; that Koko-Besse Local Government in collaboration with Koko community can actively manage solid waste generated in the township. Based on these findings it is strongly suggested that the solution to solid waste in the town is community involvement by the Local Government Council to collaborate for sustainable and effective solid waste management in the township.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Solid waste management is one of the major problems facing urban and rural areas more especially in developing countries. The dwellers of the community are said to be the potential generators of the waste (Ogueleka, 2009). Consequently, the residents of the community need to be among the stakeholders that are managing the waste. Nowadays, the rate of solid waste generated is far higher than the capacity of the stakeholders to manage it effectively (Borogo, Ali and Bukar, 2012). The increasing population, urbanization, and industrialization contribute to further increase in refuse and accumulation of waste. In view of this fact, solid waste management has been one of the main responsibilities of both urban and rural communities. The fundamental objective of solid waste management programmes should be to minimize polluting the environment as well as utilizing the waste as a resource (Asi, 2013). The described scenario applies to our study area, Koko town, in Koko/Besse Local Government Area in Kebbi state.

Many communities in developing countries see solid waste management as a difficult and problematic task (Asi, 2013). The ever-increasing need to tackle solid waste problem in communities especially by governments at all levels has called for the development of community participation in Solid Waste Management (Borogo, Ali and Bukar, 2012). So this research assesses solid waste management practices and the possibility of residents in Koko town to partner with the local government to participate effectively in managing solid waste generated in the town. Rodgers (2011) submits that SWM is a systematic control of generation, storage, collection, transportation, and disposal of solid waste. Some operational words cut across all the definitions cited; they are: source reduction or systematic control of

generation; recycling and collection and safe disposal. Arguably, these action-oriented activities common to the definitions cited are implicit duties producers of solid waste are expected to perform to make any meaningful solid waste management successful. This rationale is the linchpin of the concept of community participation in solid waste management.

Indeed, this is not the first attempt at examining Community Participation (CP) in SWM. Bolanle *et al.* (2012) has examined the factors influencing Community/Households participation in waste disposal and management in Ijebu-Ode, Ogun State. The study revealed that some 69% of respondents were ready to participate in solid waste disposal in that very large town. Following the recommendation of that study, it is necessary to find out whether or not waste generators in other large settlements in Nigeria are ready to team up with authorities to manage the waste they generate. The contention is that several studies (notably Ajadike, 2001; Abiodun, 2003; Adewole, 2009; Ogwueleka, 2009; Sanusi, 2010; Haruna and Basher, 2012; Muhammad and Manu, 2013) have highlighted that the generation and management of solid waste in cities and towns in Nigeria have reached an alarming level. The studies indicate that so far, the solutions applied had not remedied the situation. A cursory review of the cited literature reveals that solid waste management has been mostly engineering-based and has been devoid of popular participation.

The issue of solid waste management although has been studied in Nigeria, only few researchers have demonstrated fully how to mitigate the problems. The mitigation measures that have been put forward have been mostly related to the importation of solid waste handling gear and construction of concrete receptacles but such measures have always failed. There is virtually no evidence in literature to suggest that this poser has attracted the

imagination of agencies responsible for solid waste management. This is the impetus of this study.

Community participation might be an efficient way of improving the quality of public projects and services because it is inherently cost-effective. Secondly, Ahmad and Ali (2004) reasoned that several community improvement projects initiated by governments (Federal, State, and Local) such as waste dump sites have failed. This has been due to inadequate cooperation from the people or simply apathy by local communities; thus, one surest way to succeed in carrying out community projects is to make communities understand and accept that the projects are theirs not the government. Thirdly, people are becoming increasingly aware that the several materials could be retrieved from solid waste and that individual households, waste scavengers, itinerant buyers and large enterprises are generating income from such items. Thus, communities can be sensitized to realize that solid waste can be easily turned to wealth.

There is yet another reason for the advocacy of community participation in SWM. Although composting of organic waste into manure for farming has been a long practice in northern Nigeria, the practice has not been organized on formal commercial scale and community participation might lead to this. Adejobi and Olornnimbe (2012) contended that community participation in waste management could be an effective method of managing solid waste because people can easily envision that it may improve their health as well as control any environmental degradation around them. It is easy to see that community participation holds several promises for urban residents. It is therefore necessary to evaluate the preparedness of the residents in Koko town actively participating in managing solid waste generated in the town.

1.2 Statement of the Problem

Solid waste mismanagement has been causing a number of problems to human, animals and environment in Koko. The direct dumping of solid waste on bare soil deteriorates and destructs the soil. Solid waste blocks drains and gullies thereby leading to floods during rainy seasons and forming stagnant water for insects breeding. Similarly, solid waste mismanagement in neighbourhoods leads to increase in malaria disease due to the possible increase in mosquito breeding areas. Improper (SWM) practices attract rodents and flies that spread disease pathogens that subsequently cause significant array of human and animal diseases. Therefore, such problems might thus negatively affect human and animal health in Koko town.

Limited community participation in (SWM), inadequate waste storage facilities, irregular collection of solid waste, waste dumping on undesignated places such as open spaces that are located nearby houses and road sides are among major problems facing (SWM) waste in Nigeria. Solid waste mismanagement is characterized by inefficient collection methods, insufficient coverage of the collection system and improper disposals. Indiscriminate dumping of waste contaminates surface and ground water supplies (Ogwueleka, 2009).

Due to the series of activities and complexity in (SWM) practices, the responsibility and burden in managing it start with its generator. (SWM) is not only the responsibility of the generator but a collective responsibility involving the households, community, private and public organizations and government. Mudzengerere and Chigwenya (2012) suggest that the participation of stakeholders such as communities and private sectors are very limited and this is putting a lot of burden on the city council as they are failing to adequately fund solid waste management operation. This fact presupposes that community participation is a necessary pre-condition for the achievement of any sustainable solid waste management system. Sanusi,

(2011) highlights that community participation is a precondition for sustainable (SWM) and it involves the community at different stages and degrees of intensity in the waste management cycle. Therefore, there is need to study the possibility of applying this notion in Koko (SWM). Several authors have indicated that limited community participation or collaboration between communities, government and private sectors has a significant impact on the effectiveness of (SWM). Hence, the idea of involving community to participate in (SWM) is very essential to the success of any (SWM).

1.3 Research Questions

(i) Is Koko community playing a significant role in managing solid waste generated in the town?

(ii) What facilities are used in Koko to store solid waste before disposals?

(iii) For how long do Koko residents keep their solid waste in the storage facilities before disposal?

(iv) What distances do residents cover to dump their waste?

(v) Are Koko residents convenient with the locations of their dump sites?

(vi) At what time interval is waste evacuated from dump sites in the study area?

(vii) Who evacuates solid waste from dump sites?

(viii) How efficient is the level of performance of Local Government Authority (LGA) in managing solid waste in the study area?

(ix) Are majority of adults willing to participate actively in managing solid waste in the study area?

1.4 Aim and Objectives

The aim of the study is to assess solid waste management practices and feasibility and practicability of community participation in solid waste management in Koko. To carry out the assessment, the following objectives are pursued:

i. To examine the role of Koko community in solid waste management.
ii. To find out the types of predisposal solid waste storage facilities used by residents of the study area.
iii. To find-out for how long residents keep their solid waste in the storage facilities before disposal
iv. To find-out the distance the residents cover to dump their waste.
v. To find-out whether Koko residents are comfortable with the locations of their dump sites.
vi. To-find out the time interval waste evacuated from their dump sites.
vii. To-find out who evacuates waste from the dump sites.
viii. To-find out whether or not the Local Government Authority is performing solid waste management in the study area.
ix. To find-out whether residents are willing to participate actively to manage solid waste in the study area.

1.5 Rationale of the Study

The study offers additional information to government and policy makers on solid waste management. Likewise, it might induce residents' involvement in waste management. The findings of the study might also sensitize local communities and local government officials to embrace the idea that waste can be turned in to wealth (useful products). The study therefore will provide reliable information on whether involving communities in solid waste

management will lead to effective solution to the problem emanating from solid waste management. The finding of the study is expected to motivate community to keep participating in solid waste management practices.

1.6 Scope and Limitation

The study assessed the participation of Koko residents in managing their solid waste (they generated daily). The study is limited to solid waste management in Koko town and the data was collected from sampled heads of the households using interview method. The study surveyed the roles Koko residents play in domestic solid waste management practices. The responsibilities that Koko-Besse Local Government Authority play in managing solid waste in the study area were also examined. The research work studied general methods, roles and tools used by the residents to manage their domestic solid waste. The residents' readiness to participate in the future and collaborate with the local government to properly manage solid waste in the town was also assessed. Thus, the study is limited to assessing domestic solid waste management in Koko town between 20015 and 2016

CHAPTER TWO

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

2.1 Conceptual Framework

The conceptual framework of this study is the Ladder of Community Participation for Underdeveloped Countries (LCPUC). The concept was proposed by G. Choguill of University of Sheffield, United Kingdom in 1996. This ladder is based on the involvement of community to and it facilitates active participation process. It focuses on community participation practices by providing basis for understanding how community participation can be achieved in developing countries.

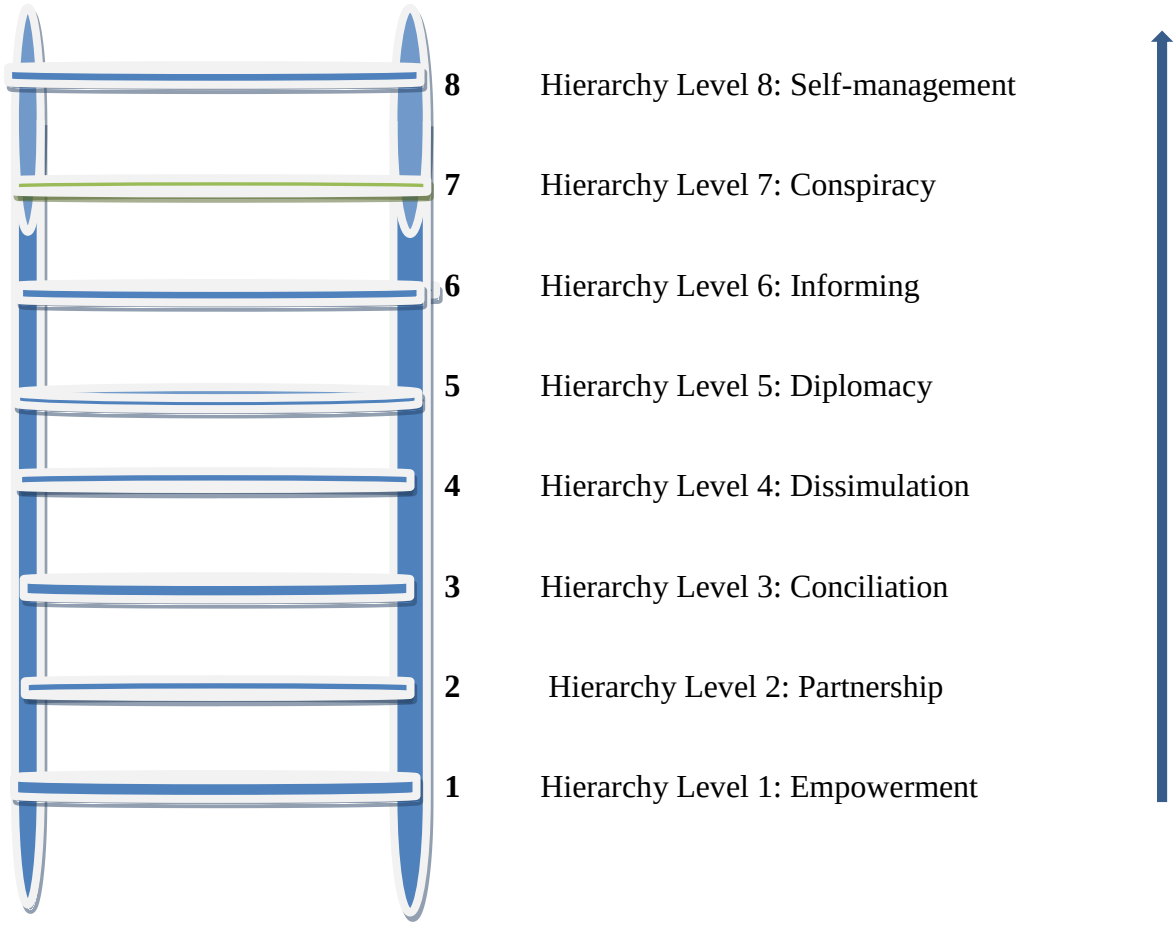

Figure 2.1 Community Participation Ladder.
Source: After G. Choguill, (1996).

According to this concept the scales of community participation defends on the degree of government's willingness to support community participation practices. The concept is structured on 8 hierarchical levels and they are explained level-wise as shown in Figure 2.1.

Hierarchy Level 1, Empowerment:

Empowerment is the first rung on the ladder. At this stage, government can empowers community to participate in community development practices by involving their representatives in planning and decision-making, thereby participating in execution of development practices similar to solid waste management activities. At this level government provides communities with support by building certain structures and facilities that facilitate solid waste management. It will also assist in planning; controlling and proper monitoring progress of activities. The authorities will also establish necessary prerequisite for actual community control of these activities.

Hierarchy Level 2, Partnership:

At this rung of the ladder, members of community and decision makers as well as planners agree to share responsibilities of planning and decision-making on developmental projects by involving community as planning and joint policy board for resolving problems and conflicts. At this end the structures and facilities provided by government belongs to it but community is responsible for operating and maintaining the system. And the community must provide all necessary repairs and further improvements. But it is the authority that designs the system and covered the initial cost as well as technical assistance but community will be involved in the process of making the system, in addition to that the community will sustain usage of the system. The reason is that they were involved from the initial stage of system's development and were trained to maintain it.

Hierarchy Level 3, Conciliation:

Conciliation is the third rung on the ladder of community participation. It occurs when the government devise solutions that are eventually ratify by the community. It may take the form of appointing few representatives of community as advisory group, or even decision-making body on issues that they can be hears, but also they will be force to accept the decision of powerful and persuasive elite (government). The guidelines and procedures designed by the authority will be adhered to by the community. Never the less the community can introduce acceptable social motives to the authority. And they can be considered and gain approval.

Hierarchy level 4, Dissimulation:

This is the fourth rung of the ladder. In order to achieve acceptance of community to participate the members of community are represented on rubber-stamp advisory committee or board, purposively to orient and engineer their participation processes. From this level downward, the government increasingly leaves communities to do it themselves. At this level the technical and advisory teems will be put in place to attend and forward any demands and complaints from the community to the top authority for necessary action.

Hierarchy level 5, Diplomacy:

Diplomacy is the fifth rung at this level in case of government's lack of interest, financial resources or incompetence, community is expected by itself to make the necessary improvements, usually with the near-heroic assistance of NGOs. When there is a possibility that the community by itself accomplishes real improvements or when NGOs are involved, the government may change its attitude by providing limited support. Diplomacy involves consultation, attitude surveys, public hearings, and visits to the neighborhood or meetings

with community. The concerns and ideas of community will be taken into consideration and supports to the community will be enhanced.

Hierarchy Level 6, Informing:

This consist flow of information from government officials to the community. They will be informing of their rights, responsibilities and options, without allowing for feedback or negotiation. This is a level of manipulation, and constitutes the sixth rung down of the ladder.

Hierarchy Level 7, Conspiracy:

Conspiracy is the seventh rung of this ladder. Here, no participation in the formal decision making process is allowed or even considered. It includes cases where the reasons given by authorities for action and cover the underlying motives. At this level the policy and aim of government for providing the system will be pursued and adhered to so that the aim and objectives of the system will be attained.

Hierarchy level 8, Self-Management:

Self-management is the highest rung of the ladder and at this level government will leave community members to solve any problem regarding the system by them. At this level they can plan improvements road map to their neighborhood projects and actually control the situation and affairs of the developmental projects. Since they were empowered; involved and train from the initial stages and also taught on planning; project management; decision making and project maintenance the community members will be able to maintain and sustainably improve from where they were delegated to handle the system.

The community participation framework shows that governmental attitude is essential in determining the potential results of community participation. The degree to which manipulation used by government determines frustration levels in community. In this

regards, the governmental approach towards the community participation by either supporting or rejecting it. Empowerment and self-management demonstrate that basic needs can be achieve with or without governmental supports. Usually, governmental willingness to support the people may be temporary. Likewise, as governmental leadership changes, the governmental approach, philosophy and dogma may also change.

Ladder of Community Participation for Underdeveloped Countries was chosen for this study because of its appropriateness. Therefore, this framework is relevant to the study of community participation in solid waste management in Koko town. The residents of Koko Township generate solid waste on daily basis whereas Koko-Besse Local Government Authority (KBLGA) can involve Koko community to undergo the 8 hierarchical steps mentioned by the ladder of participation framework. The application of Ladder of Community Participation in Under-developed Countries will ensure feasibility and sustainability of community participation in in effective solid waste management practices. This might also provide basis for understanding community participation practices and pave way for its acceptable and proper sustainability in solid waste management. The sustainability in community participation in Koko town might base its root on degree of governmental willingness to support resident's participation in managing solid waste generated in the neighborhoods. By involving community by KBLGA can mitigate the scattered and heaps of solid waste in the township.

2.2 Literature Review

2.2.1 Solid Waste

Solid waste is one of the major problems facing urban and rural areas mainly in developing and underdeveloped countries. Solid waste consists of discarded household, commercial, institutional and industrial materials. Typical examples of solid waste include; abandoned

vehicles, animal dung, and empty bottles, wood ash, pieces of wood and metals. Muhammad and Manu, (2013) defines waste as any unwanted material that is due for discarding but Agwu, (2012) says waste is any substance or object which the holder discards or intends to discard. While the United States' Environmental Protection Agency, (2010) defines solid waste as all discarded household, commercial, non-hazardous institutional and industrial wastes, street sweeping, construction debris, agricultural waste and other non-hazardous and non-toxic solid waste. Summing from these opinions waste is a resource but it can be seen abandoned or thrown away in a wrong place.

Consequently, any valuable or un-valuable material or substance in Koko Town which is abandoned, thrown away or intended to throw away is regarded as waste in this study. Summing from these opinions waste is a resource but it can be seen abandoned or thrown away in a wrong place. Typical examples include; abandoned vehicles, animal dung, and empty bottles, wood ash, pieces of wood and metals. Indeed the contemporary solid waste consists of inert materials, vegetable matter, metal, paper, cartoons, textiles, glass, plastics, rubber, leather, wood, bones, and batteries among others.

2.2.2 Sources and Classification of Solid Waste

Solid waste is generated in different human endeavors on different capacities. It can be generated from residential neighborhoods, commercial centers, schools, institutions, clinical or medical centers, industrial locations, agricultural places, recreational places, parks, offices and mines places. The dwellers of the community are said to be the potential generators of the waste (Ogueleka, 2009). Victor and Choji, (2009) demonstrates that solid waste can be classified according to its composition, source of generation as well as its physiochemical properties. Pervez and Kafeel, (2013) states that solid wastes are categories on the basis of some parameters: source, type, generation rate and composition. However, Environmental

Protection Agency, (2010) classifies solid waste based on source as: municipal (domestic, institutional and commercial), agricultural, mining and inorganic, radioactive and industrial wastes.

Solid waste can be classified based on several parameters including: sources (municipal, residential, agricultural, mine and minerals, commercial, institutional, industrial, construction and demolishing, radioactive, and sanitary wastes); composition (organic, inorganic, ashes, bulky, recyclable, and non-recyclable, wastes); physiochemical (biomedical, soiled, infectious, hazardous, and non-hazardous wastes). Asi (2013) demonstrates that solid waste can be classified according to its composition, source of generation as well as its chemical properties. Solid waste in Nigeria comes from commercial, industrial, household, agricultural and educational establishment sources. Adewole (2009) classifies Municipal Solid Waste (MSW) into residential, commercial, institutional and industrial.

Garbage is mainly generated from residential and commercial centers in the cities and organic waste generated from kitchen, shells, vegetables, flowers, leaves, fruits, crop residues, foliage and garden. Classes of solid waste mentioned here are commonly sourced from residential, agricultural, commercial, institutional, construction and sanitary activities. Similarly the classes of solid waste mentioned above are found to be scattered and piled up in Koko town. Adewole, (2006) reveal that solid waste in Nigeria come from commercial, industrial, household, agricultural and educational establishments sources. Ogueleka, (2009) shows that solid waste from households, non-hazardous solid waste from industries, commercial and institutional establishments (including hospitals' waste), market waste, yard waste and street sweepings are classifies as municipal solid waste. Environmental Protection Agency highlights that garbage is mainly generated from residential and commercial complexes.

Organic waste is mostly generated from kitchen, shells, vegetables, flowers, leaves, fruits, crop residues, foliage and garden. Toxic waste emerges from discarded medicines, paints, chemicals, bulbs, fertilizer and pesticide containers, batteries, shoe polish, and medicine bottles. Recyclable waste is mainly generated from paper, glass, metals, plastics, aluminium products. Reasoning from the above facts, solid waste in Nigeria comprise of waste materials including garbage, rubbish, ash, dust, textile materials, old batteries, lamp and touch-lights, agricultural produce, disused farm implements; vehicles; metals; zinc; furniture; kitchen utensils; bags; nylon and books, bones, pieces of wood, plastics, construction debris, animals dung, and damaged electronics. Solid waste might differ in composition from major settlement to settlement because of the use of packaged goods is high in the cities than towns and villages. In the towns and villages the use of vegetable and other food waste is likely to be high than that of packaging waste.

2.2.3 Solid Waste Management

The general view of solid waste management is to safely collect, treat and dispose solid waste in an environmentally and social satisfactory manner. Among the important methods of waste management is source reduction. Proper methods of reducing waste generation include: reuse of second-hand products, repairing broken items instead of buying new, designing products to be refillable or reusable (such as cotton instead of plastic shopping bags), encouraging consumers to avoid using disposable products (such as disposable cutlery), removing any food/liquid remains from cans, packaging, and designing products that use less material to achieve the same purpose for example, light weighting of beverage cans (Wikipedia, 2009). Furthermore, Adewole, (2006) opines that waste management is the organized and systematic channeling of waster through practically, economically and technically appropriate recovery or disposal route in accordance with acceptable public safeguards.

It seems fairly obvious that solid waste management brings about an effective and sustainable process that needs the active participation by all stakeholders. These stakeholders include solid waste generators, voluntary and private organizations carrying solid waste management activities, and government and international organizations. Rodgers, (2011) thinks it as systematic control of generation, storage, collection, transportation, separation, processing, recovery and disposal of solid waste. With regard to these views; solid waste management is not only collection, transportation, treatment, final disposal and recycling of solid waste but it encompasses several processes that lead to the final disposal of waste in a harmless method, so that it do not causes problems and hazards to the people, and the environment.

2.2.4 Problems Facing Solid Waste Management

The challenges in solid waste management are highly increasing as a result of the increase in population and rapid increase in solid waste generation, Pervez and Kafeel, (2013) argues that with increase in the global population and rising demand for food and other essentials, there has been a rise in the amount of waste being generated daily by each community. Therefore, the constraints faced in solid waste management process are leading to the setback to the achievement of effective and sustainable solid waste management in Nigeria Ayodele, (2009) affirms that the constraints to effective solid waste management are not limited to lack of policy or laws, but poor infrastructure, education, social awareness of problems and solutions and lack of institution promoting sustainable environmental action.

Therefore, efficient periodic waste collection, standard institution responsible for solid waste management, standard waste management tools and infrastructure, active environmental laws and policy, environmental education and social awareness are very vital in solid waste management system, failure in any of these will consequently results in the failure of the system. Improper municipal solid waste disposal and management causes all types of

pollution: air, soil and water. And indiscriminate dumping of wastes contaminates surface and ground water supplies. Solid waste clogs drains creating stagnant water for insect breeding and floods during rainy seasons Fervez and Kafeel (2013). The Indiscriminate dumping of wastes contaminates surface and ground water supplies, and it is characterized by inefficient collection methods, insufficient coverage of the collection system and improper disposal Ogwueleka, (2009). It causes the blockage of drain, creating stagnant water for insect breeding and floods during rainy seasons (Fervez and Kafeel, 2013). Thus, these are among the major constraints in achieving proper solid waste management system in Nigeria.

The management of solid waste, perhaps, stands as the most visible environmental problem facing the Nigerian cities; it remains a single environmental problem common to the urban centers in Nigeria. In Minna 82% of the households poorly dispose their solid waste indiscriminately, using wheel barrow, burning and direct disposal to a place they consider convenient, as a result, solid waste in Minna finds its way into city drains and neighborhood streets (Sanusi, 2010). Therefore, in many Nigerian municipalities the stakeholders responsible for the evacuation of solid waste from the community dumping sites are failing to deliver the services sustainably, and the households and other waste producers are not doing the best in handling the waste they produced. As a result of that solid waste has been seen scattered in many cities of the country.

In addition to that the constraints responsible to the failure in achieving proper solid waste management are not limited to ineffective evacuation of solid waste from dumping sites, but it encompasses lack of active community participation, poor infrastructure, education, awareness of solid waste problems and solutions, poor implementation of environmental policy and laws, and lack of institutions promoting sustainable environmental actions. Ogwueleka, (2009), emphasizes that improper solid waste management is characterized by

inefficient collection methods, insufficient coverage of the collection system and improper disposal. Thus, there are other several factors influencing proper solid waste management in Nigeria. These include lack of advanced technology, lack of facility for separation at source, lack of solid waste management policy and enforcement, inconsistency in government policy, laziness and corruption by workers, lack of environmental education and awareness and lack of proper participation by community members among others.

The nature of solid waste management in developing countries is still facing a number of challenges thereby leading to different hazards to human, animals and the surroundings. Based on reconnaissance survey Koko Town solid waste management is facing the stated problems. The inadequate wide coverage of solid waste management programs and its inexistence in large number of settlements is among the major problems deteriorating solid waste management. However, even in the cities where solid waste management is supported by government and other non-governmental organizations, the system is suffering from weaknesses in capacity of running the system effectively. As a result of the stated problem, the capacity building is very necessary to resolve the said solid waste management obstacle.

2.2.5 Solid Waste Management in Nigeria

Solid waste management in Nigeria has been facing a number of setbacks which might be resulted by inefficient participation of stakeholders. In the Abdullah's (2013) study in Birnin/Kebbi, the Kebbi Urban Development Authority (KUDA) involves the owners of tipper trucks, in solid waste management. It further states that there is no formal arrangement on involving private sector in waste management in the municipality, except the traditional annual drainage sanitation exercise which holds at the beginning of every rainy season. Agwu, (2012) suggests that considerable percentage of solid wastes generated in Port-Harcourt are either deposited on the roads, or road sides, unapproved dump sites, in water

ways (drainage system) or in open sites which adversely affect environmental friendliness. Sanusi's (2010) study on solid waste management in Minna demonstrates that there is a weak capacity on the side of governmental organizations in carrying-out solid waste management.

Nigerians have not been particularly concerned about waste management; open dumping and open burning on unapproved locations, has been the norm (Alexander et al., (2012). Sanusi, (2010) concludes that in Minna Metropolis 82% of the households poorly dispose their solid waste indiscriminately, using wheel barrow, burning and direct disposal to a place they consider convenient. Improper solid waste management is characterized by inefficient collection methods, insufficient coverage of the collection system and improper disposal Ogwueleka, (2009). Abdullahi, (2013) concludes that in Birnin/Kebbi the major disposal methods of solid waste include open dumping, landfill, and incineration. Among major challenges confronting solid waste management in developing countries are direct disposal at a wrong place and open burning, delay in the periodic collection by the responsible bodies, limited awareness of the health hazards resulting by poor waste handling, negligence and unwisely attitude by waste handlers, corruption and its related practice.

2.2.6 Acceptable Proper Solid Waste Management Processes

Integrated Solid Waste Management (ISWM) is among proper solid waste management process and it necessitates effective community participation. Based on 3R (reduce, reuse and recycle) principle. The ISWM system indicates that with appropriate segregation, and a recycling system, significant quantity of waste can be diverted from landfills and converted into resource. It can increase recycling and recovery through waste incineration, and control air pollution (United Nations Environment Program, 2012). Bolanle *et al*. (2012) asserts that an effective and sustainable solid waste management system ensures better ecological safety by preventing the existence and spread of environmental hazards. This might be made

possible through the following processes: reducing the garbage generated by using less take-away, buying larger and bulk packages rather than multiple smaller packaged products, buying more durable and long-lasting products and taking care of clothes and appliances to reduce their turnover.

Other strategies are: re-using daily household items like shopping bags, plastics, bottles, and plates whenever possible. Koko residents have to induce to adopt acceptable and proper solid waste management practices. An effective and sustainable solid waste management system ensures better ecological safety by preventing the existence and spread of environmental hazards. If the waste generated the stakeholders should engage in recycling the recyclable waste materials to reduce the amount of garbage generates. Recycling is to make use of materials that otherwise would become waste, by turning them into valuable products. Composting biodegradable waste is another form of recycling. Composting can help towards reducing the overall household waste. It benefits both farm and garden and it is simple. Composting is the controlled aerobic-biological decomposition of organic matter such as food scraps and plant matter into humus; a soil-like material.

Compost acts as a natural fertilizer by providing nutrients to the soil, increasing beneficial soil organisms and suppressing certain plant diseases, thereby reducing the need for chemical fertilizer and pesticides on farming. Among the proper solid waste management process is to repair broken items instead of throwing them away and to sell or donate items that are not needed by the owner. Another important process of recycling is piling and combusting the scattered waste around the living environment. Combustion is the controlled burnings of waste in a designated facility with the aim of reducing its volume and in some cases to generate electricity (Chukwuemaka, et al, (2012). It must be added that the separation of hazardous from non-hazardous, recyclables from non-recyclables, biodegradable from non-

biodegradable waste materials. Among the important processes are to control the storage before the transfer or transportation of solid waste. These notations can likely be applicable to Koko Town solid waste management system.

The series of activities associated with proper solid waste management from the point of generation to the final disposal are many these include: waste prevention or reduction in generation, waste generation, waste handling and sorting or separation, storage, treatment and processing at the source of generation, reuse and recycling, collection, segregation by waste collectors, treatment, processing and transformation, transportation or transfer and final disposal at landfill. Asi, (2013) argues that series of activities in solid waste management are closely interconnected but they are not necessarily presented in every municipal solid waste management system. But in developing countries the system is mostly limited to waste generation, handling at the source, collection and disposal at landfills. These activities are very vital in every solid waste management system, though they do not inevitably exist in every solid waste management system especially in developing countries.

However, locating proper sites for solid waste disposal and selecting appropriate land fill sites far from residential areas and settlements is very vital in solid waste management. A proper way of solid waste disposal is to dispose it in properly designed and constructed dumping sites, which will be located more than 100m from major high ways, city streets or other transport routes and proper control of landfills.

2.2.7 Managers of Solid Waste

The initial managers of solid waste are the people that have generated it, thus solid waste management is therefore a collective responsibility of all parties. Borogo, Ali and Bukar, (2012) argue that Bauchi State Environmental Protection Agency manages the waste at the

metropolitan level in collaboration with community based organizations, non-governmental organizations, and trade unions. The study revealed that household members mainly women are in charge of the waste management at the lowest level that is the household level. Wikipedia, (2009) states that waste management of non-hazardous residential and institutional waste in metropolitan areas are usually the responsibility of local government authorities, while hazardous commercial and industrial waste is usually the responsibility of the waste generator. Asi, (2013) confirms that Municipal Solid Waste Management (MSWM) is the major responsibility of local government authorities.

2.2.8 Concept of Community Participation

People living in a community have both individual and collective responsibilities. EPA, (2010) defines community involvement as engaging in dialogue and collaboration with community members. Adewole, (2009) concludes that community involvement is more effective when people are given specific tasks and training. To Bolanle et al. (2012), community Participation (CP) in waste disposal and management will over time continue to be significant discourse among academia and policy makers. It is pertinent that all involved decision-making mechanism should be accorded in different households to allow the views and preferences of all household members in disposal and management of waste.

The socio-economic ability of community members is a prominent variable that enhances participation of household members in disposal and management of waste. Adewole, (2009) highlights that community participation has been advocated as a way to improve the quality of public projects and services; evidence from randomized evaluations provides very mixed results about its effectiveness. Community involvement in solid waste management enables community members to get involved in projects that affect them; the stakeholders will

eventually listen carefully to what the community is saying and change planned actions where community comments or concerns have merits. The stated importance will lead to the sustainability in solid waste management, since the priority is given to the community in carrying-out the process.

The community members should participate in different ways, such as collection fees, offering waste at appropriate time and location and separating recyclable materials. Sanusi, (2010) concludes that community participation is a precondition for sustainable solid waste management, and it necessitates involving the community at different stages and degrees of intensity in waste management cycle. Thus, community members can be involved in awareness-raising activities, participation in meetings or be part of committees that manage waste services. The total involvement of community in all programs concerning environmental clean-up and management is a pre-condition for the effective and sustainable SWM practice. With effective community participation, solid waste management could be effective and sustainable.

2.2.9 Community Participation in Solid Waste Management

Solid waste generation is ever amassing in Nigeria, thereby increasing the problems of its management. The ever increases in solid waste problems and inability of authorities that are statutorily responsible to manage such problems led to the call for community participation in solid waste management. Community participation in solid waste management refers to taking-part (s) in the activities related to the solid waste management process (Borogo, Ali and Bukar, 2012). Therefore, it consists of individuals and collective involvement at different stages of solid waste management.

Furthermore, community participation in solid waste management is to maintain any solid waste management system to keep functioning effectively and efficiently, through the support of community members. It involved the process of putting the solid waste generated in the houses, work places, commercial centers, institutions, on the streets, backyards, on the farms and gardens in a proper way at a right time. It also involves the activities like separating recyclable or organic materials from other waste, offering waste at the right place and in proper time for collection, and cleaning the area around the houses.

Moreover, community participation in solid waste management starts from individual households to community and to municipality. Segregation of hazardous from non-hazardous and recyclables from non-recyclables solid waste materials, disposal of solid waste at a community dumping site, payment of charges by household for the collection and removal of their solid waste are would be classified among basic community participation in solid waste management. Others may include utilization of household solid waste as a resource by selling or donating some recyclables to waste scavengers or itinerant buyers. It also involves reducing the daily volume of waste generates and reusing old reusable products. Based on the reconnaissance survey there are indications of community participation in in the study area.

2.2.10 Relevance of Community Participation in Solid Waste Management

Community participation in solid waste management is eventually needed due to its positive impacts. Asi, (2013) argues that community participation in solid waste management is one of the most promising methods of environmental protection. Therefore, if community participates collectively and effectively they will protect their environment from waste hazards. Adejobi and Olorunnimbe, (2012) believe that community participation in waste management can be effective as it is increasingly improving environmental sanitation, health

and wellbeing in Nigeria. Thus, better management of waste from the grass-roots by household participation can significantly reduce emissions of certain gasses to the atmosphere. The deprived in household involvement in solid waste management can negatively affect generation of wealth from waste.

The idea of community participation is increasing in Nigerian urban and rural areas, and it is positively contributing to solid waste management system. The increase is connected with the advancement of changing waste to wealth activities. Effective community participation will ultimately improve the environmental quality, and socio-economic development. These can be recognized by achieving sanitary condition; limited waste related hazards and wellbeing of the environment, changing wealth to wealth, and reduction of the exposure to waste related diseases. Thus, proper community participation in waste management will provides individual household with environmental education and awareness of solid waste problems and solution. It also improves the generation of socio-economic importance from solid waste management. Sanusi, (2010), suggests that community participation may give the opportunity to devise and initiate strategies to improve the state of waste management. This support would lead to achievement of proper solid waste management system in municipalities.

Successful community involvement in solid waste management can lead to generating some related policies and procedures for the betterment of solid waste management system. Therefore, with fruitful community participation in public projects and services the lifespan and sustainability of such projects and services would be achieved. To Asi, (2013) treating every waste as a resource, will be pivotal in sustainability of SWM. Based on the reconnaissance survey the relevance of community participation to domestic solid waste management has been seen. However, proper community participation will encourage the achievement of proper solid waste management practice within the community and

municipality at large. Thus, it will contribute immensely to the achievement of environmental sanitation and general wellbeing of the community.

2.2.11 Factors Responsible for Effective Community Participation in Solid Waste Management

A successful solid waste management process requires community cohesion in participation, good perception and willingness to collaborate. Mudzengerere and Chigwenya, (2012) ague that community participation can be effective by building local capacities and activating the handlers to take an active role in waste management and urging residents to actively participate in refuse management. The entire process should start at households where sorting and composting should take place. Therefore, with the success and sustainability in the stated points the community participation in solid waste management will be successful and sustainable. The behavioral and attitudinal change of people by embracing solid waste reduction, reuse of certain products and recycling some waste materials are very vital for sustainable solid waste management. Likewise, there is need for sensitizations of residents on the dangers of poor solid waste management, as well as provision of near-by dumping sites with up-to-date segregation facilities to enhance easy collection and disposal of solid wastes from households (Agwu, 2012).

The greater community involvement does not only minimize the chances of conflicts that have been a setback to major environmental projects but enhances environmental monitoring, management and capacity building of local community members. Involving community members is often a slow process but the outcome is always far reaching. Strong concern for a clean environment and the belief that capacity building, access and dissemination of waste management information, awareness campaign and protection of community concern by allowing greater access to a decision concerning planning, operation and the management

facilities is so vital (Asi, 2013). Therefore, involving the community in solid waste management is very essential and it is leading to its success and sustainability, and improves environmental standard and education. Based on the stated views solid waste management could be successful with local capacity building and if the communities are coherent and willing to participate.

2.2.12 Problems Facing Community Participation in Solid Waste Management

There are certain issues and challenges that are undermining efforts made by community in solid waste management practices. Until recently, Nigerians have not been particularly concerned about proper waste management; open dumping and open burning on unapproved locations, has been the norms (Alexander et-al 2012). Thus, in Nigeria, the behavior of violating the environmental laws and regulation is very common. Many are not serious about the effectiveness and sustainability in solid waste management practice, but they are dumping their waste in open spaces near-by houses and at outskirt of the towns, and they are even burning it at unapproved locations.

Lack of stiff penalty, non-execution of law and awareness of environmental problems among the households would be amongst the factors discouraging community participation in solid waste management (Kumar and Nandini, 2013). In the view of Haruna and Basher, (2012) inadequate public enlightenment on proper solid waste management and attendant health implications of doing the contrary, lack of proper dumping sites, inadequate periodic collection, and insufficient funds to cater for waste evacuation are discouraging community to participate in solid waste management in Nigeria. Based on the above opinions the most prominent problems and challenges facing the effectiveness and sustainability of community participation include; lack of coherent and willingness to participates in solid waste management system in line with lack of proper implementation of waste management policy.

A number of communities are facing challenges that are hindering the success of their participation. Some of the challenges are: limited awareness of solid waste problems, limited dumping sites within the communities, corruption in the implementation of solid waste management programs and policy, poor public campaign and education on proper solid waste handling, insufficient and outdated tools for solid waste management and limited perception and willingness to participate in solid waste management by the communities.

2.2.13 Changing Waste-to-Wealth

Wealth generation from solid waste has been increasing in Nigerian settlements. A number of people are engaged in solid waste scavenging and itinerant buying as a result many of the people engaged in such activity has become rich. Waste management is a common concern to all communities because they produces waste and possibly utilizes a large proportion of these wastes to make real profits in terms of the environment, economics, energy supply, and conservation and material recovery (Asi, 2013). Therefore, large number of people engaged in waste scavenging as an income generating activities. Materials generated from solid waste offer some households, waste scavengers, itinerant buyers, large and small enterprises with a means of generating income. They are generating wealth from segregated and scavenged waste materials. Wikipedia, (2009) states that recycling is among the process of changing waste to wealth practice that is run through the collection and reuse of waste materials such as empty beverage containers. The materials from which the items are made can be reprocessed into new products.

Recoverable materials that are organic in nature, such as plant material, food scraps, and paper products, can be recovered through composting and digestion processes to decompose the organic matter. The subsequent organic material is also recycled as mulch or compost for agricultural or landscaping purposes. Waste gas (such as methane) can be captured and used

for generating electricity and heat. Ahmad and Ali, (2004) argues that small-scale recycling industries are playing vital roles in solid waste management through the process of recycling waste materials. They purchase items like scrap metals and aluminium utensils, using them as raw-materials to manufacture saleable products. These industries ensure self-sustaining operations that remains in existence as long as the demand for their products remains. Similarly large-scale recycling industries also, participate in solid waste management. These large industries are industrial establishments that buy suitable waste materials in bulk to use in their manufacturing process. These are profit oriented operations whose sustainability defends on the market forces.

The pressure of consumerism is resulting in continued increases in the use of resources and materials that eventually becomes waste or pollution (United Nations Environment Programme, 2012). However, recycling system uses 20 per cent less energy and reduces carbon dioxide emissions, and reducing the environmental load, through the efficient use of resources and energy (Sardan, 2012). Therefore, waste recovery and recycling are increasing in different countries of the world. The waste materials are used as a resource, and their demand is increasing more especially in developing countries. Asi, (2013) states that millions of people in developing countries depend on recycling materials from waste for their livelihood, and many informal sectors subtracts a high proportion of recycled materials from landfill.

Informal waste recycling of solid waste is mostly carrying-out by poor and marginalized social groups who resort to scavenging for income generation and it has been improving their living condition. Thus, in Nigeria large number of people depends on waste scavenging and itinerant buying to earn an income, some poor and marginalized people have no any means of earning a livelihood except from scavenging. Some people also engage in composting

biodegradable materials in to compost manure, it is used as local fertilizer on gardens and farm lands. Based on the stated views wealth can be generated from abandoned solid waste. In the process of generating the wealth solid waste management can be encourages.

2.2.14 Impacts of Waste-to-Wealth to Effective Community Participation in Solid Waste Management

Among the importance of recycling are petroleum savings, greenhouse gases reduction, energy conservation and reduction of load on landfills. Composting is among the most important and cheap forms of recycling biodegradable solid waste materials. To A.E.P., composting is a biological process that breaks down kitchen, lawn and garden waste in to soil-like material called humus. (Sardan, 2012) defines composting as an aerobic degradation of organic materials under controlled conditions, yielding a marketable soil amendment or mulch. Similarly, organic waste placed in a compost bin in the garden rots in the presence of oxygen. Microbes, fungi, insects and worms slowly decompose the rubbish into a sustainable source of compost that can be used in the garden. Chukwuemeka, (2012) indicates that composting can be particularly, helpful to communities managing their waste and thus reducing their waste and thus reducing greenhouse gas emissions.

However, recycling helps reduce greenhouse gas emission, in part, by devastating waste from landfills. Therefore, composting plays significant role in solid waste management, it saves scarce landfills space and produce rich soil supplements which promotes plants growth and improves yield. Therefore the importance of composting in solid waste management cannot be underemphasized especially in developing countries where chemical fertilizer is unaffordable to large number of farmers. The materials frequently used for making compost include; grass creeping, fallen leaves, weeds, and the remains of disease-free garden plants,

kitchen scraps such as fruits and vegetable peel and trimmings, egg shell, cowpea ground, ground-nut and Bambara-ground-nut shell nut shell, wood ashes, millet and guinea-corn shell among others. The composting process requires some organic materials like: moisture, air, and soil organisms (A.E.P., 2014). Therefore, composting is a cheap and simple process, cheap materials and easy activities are required, and it can be done successfully in an informal way. Wikipedia, (2009) states that material for recycling may be collected separately from general waste using dedicated bins and collection vehicles are sorted directly from mixed waste streams, it requires the owner of the waste to separate it into various different bins (typically wheel bins) prior to its collection.

The most common consumer products recycled include aluminium such as beverage cans, copper like wire, steel and aerosol cans, old steel furnishings or equipment, polyethylene, glass bottles and jars, paperboard cartons, newspapers, magazines and light paper, as well as corrugated fiberboard boxes. Solid waste recycling is an income generating activity for both formal and informal sectors, and it is contributing to the reduction of solid waste going to the landfill. It is an important factor contributing to effective and sustainable solid waste management.

Ahmad and Ali, (2004) states that micro-enterprises has been nowadays enter in to solid waste management activities because they see a gap in service delivery and existence of a demand for fulfilling that demand for household-to-household garbage collection (primary collection) that the government cannot provide, and seize the opportunity by providing the service in a neighborhood for small charges to the households Therefore, the processes of recycling solid waste materials improves solid waste management practice and give way to income generation from the waste. Different kinds of materials can be recovered out of solid waste; part of these materials can be reused by other users, while some proportion can be

recycled to different products. Based on the stated facts the process of changing waste to wealth is contributing significantly to solid waste management process and it is improving socioeconomic potentials of the communities.

CHAPTER THREE

MATERIALS AND METHODS

3.1 The Study Area

3.1.1 Location of the Study Area

Koko town is situated in Koko-Besse Local Government Area, in Kebbi State, Nigeria. The town is located at 11° 42' 15''N and 4° 51'69''E (Google Search 2018) Koko is among the major settlements of Kebbi State. The town is also along Niamey-Sokoto-Lagos transnational road and Porto-Novo-Kamba-Zuru transnational road (see Figure 3.1 and 3.2. The climatic condition of the town is semi-arid climate, the precipitation in the area falls between month of May and October. The dry season lasts from November to April. During the months of March to June temperature of the area is high, and the environment becomes dry. The *Harmattan* blows and drifts solid waste here-and-there in the area. During the rainy season, rain runoff drift solid waste and triggers urban flooding, the flooding directly redistributes solid waste in the town.

Koko town is the major settlement in Koko/Besse Local Government area and it is one of the most important commercial towns in Kebbi State. The tow has a strategic location and act as a central place for several towns and villages in the area. It offers several consumer products and services which include: table water, packaged foods, fuels, cosmetic products, construction and building materials, food stuffs, vegetables, fruits, farm inputs, farm implements, health services, communication services, banking services, transportation services, etc. to the people in the surrounding areas. Obviously, the socio-economic importance of Koko has a significant impact in solid waste generation, and complexity in managing the problem.

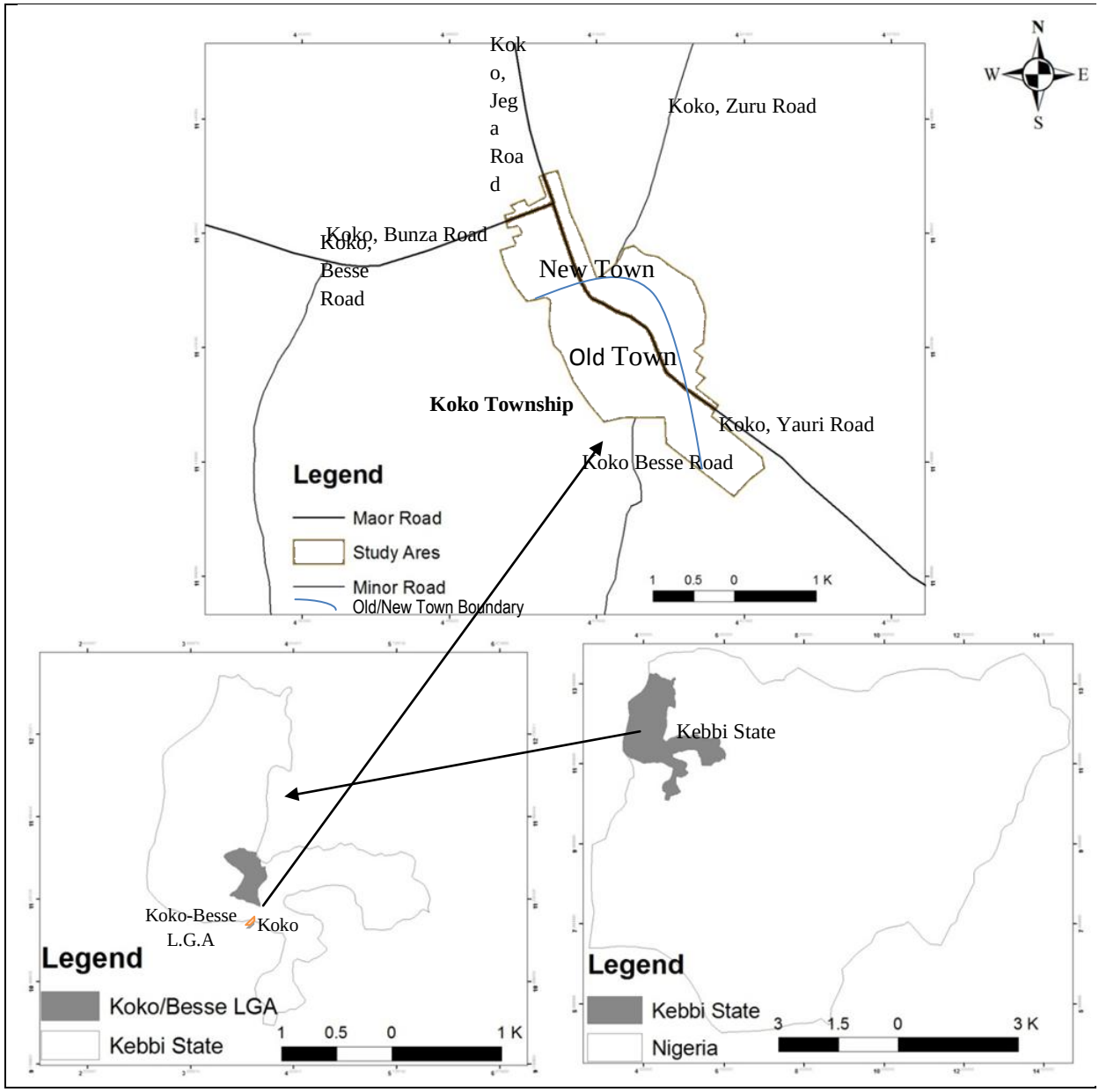

Figure 3.1 Location of Koko Town, The Study Area.
Source: Nations Online Project (2014). www.nationsonline.org.

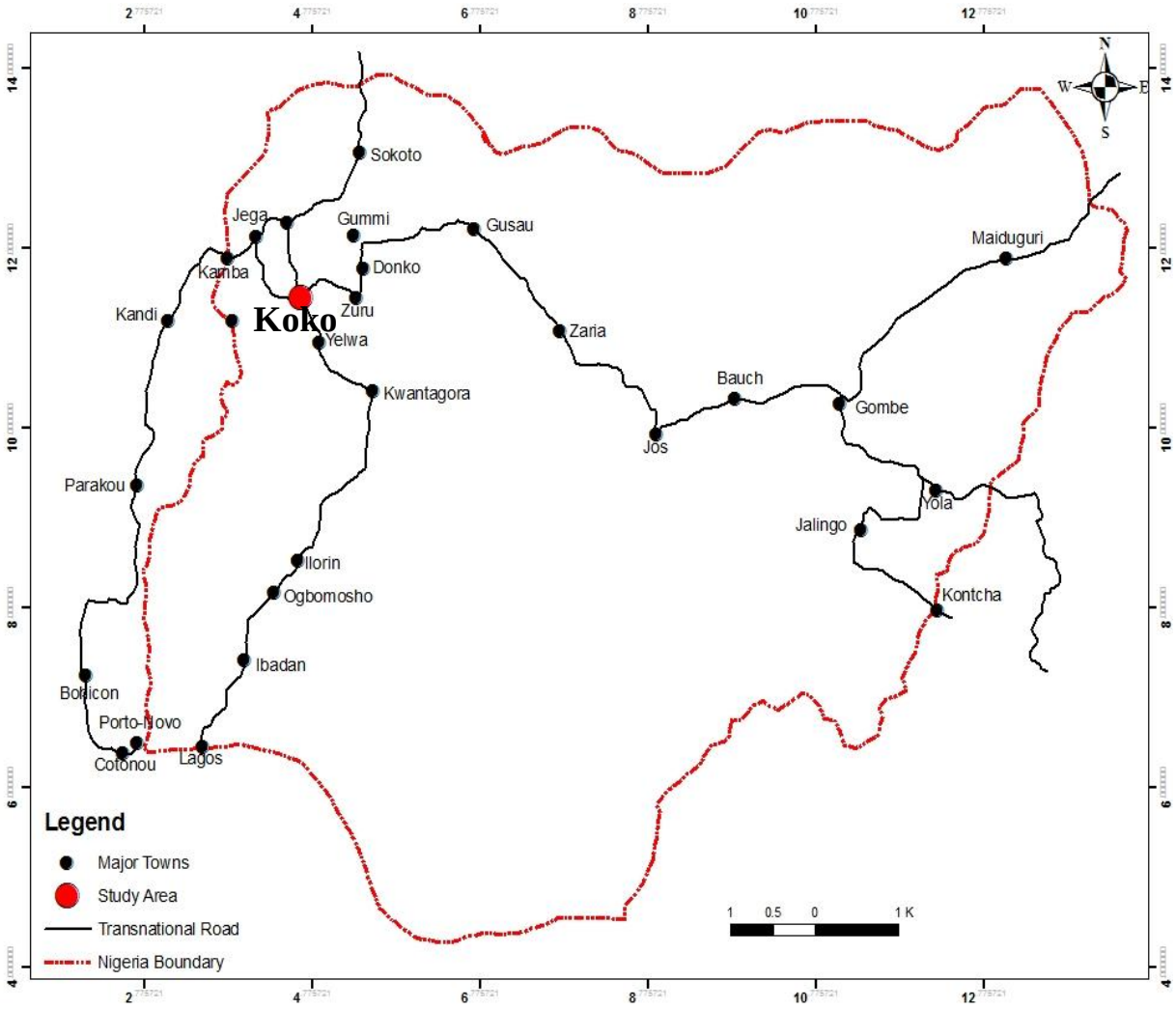

Figure 3.2: Road Map of Nigeria, Showing Transnational Roads Linking Koko Town. Source: Nations Online Project (2014). www.nationsonline.org.

Koko is along Niamey-Sokoto transnational road and Port-Novo-Kamba transnational road which comes from west to east as shown in Figure 3.2 below. The two transnational roads intersect in the town. Consequently, passengers stop to refresh, excrete, and to say their prayers. These passengers generate waste in the town through their activities. As a result, sachets of table water, plastics of soft drinks, feels from fruits etc. are thrown about in Motor Park and road junctions. Thus, the passengers passing through Koko contribute to the increase in solid waste generation in the town, as they discard a number of empty cans, polythene bags/containers, empty bottles, food remains, paper, human excretes among others.

3.1.2 Relief of Koko town

Koko town has relatively plain landscape with river Koko at the western edge of the town. There are hills at the east and south of the town while the notable Koko Hill is at north-west of the town. A marshy area which has been reclaimed and put under intensive dry and wet season cultivation is found at the western part of the town where the River Koko lies. The north-eastern part of the town has a high altitude than the south-west. Several gullies had developed inside the town, and only few drainage systems have been constructed by Koko/Besse local government council to drain the storm-water. As a result, any blockage of the sewage causes flooding in the town. This situation also allows solid waste to be deposited haphazardly.

3.1.3 Vegetation of Koko Area

The vegetation cover of Koko is characterized as Sudan Savannah vegetation i.e. the tampered vegetation that comprises shrubs, grasses, and scattered trees. However, the natural vegetation in the area has been altered or even obliterated by cultivation, grazing, construction of structures and roads, bush fire/burning etc. over a long period of time. The height of grasses in the area is about 1.3 meters tall; some grasses are perennial in nature and others are not. The grasses are forming continuous layer dominating lower stratum near the soil World Weather and Climate Information (2013). The vegetation cover has a significant impact to the increase of solid waste in the town.

Several residents in the town rely on the surrounding vegetation for their livelihoods. Fire wood collectors and carvers obtain wood from the surrounding area just as basket weavers and rope makers. These local craft industries contribute to the generation of solid waste in the town. Also, some people collect fodders to feed their animals; broad leaves are also used in

the area for selling cooked edible leaves (*Zogale*; *Tafasa*; *Rama*; *Karbado*; *Dansulub*). In addition, the dyers obtain tree barks for dyeing and tanning inside the town. All these activities add to solid waste generation in the settlement.

3.1.4 Climate of Koko town

The area, Koko town has semi-arid climate with 106 growing days; precipitation falls between the months of May and September, while the dry season lasts from November to April annually. The mean annual rainfall is about 977 millimeters and the mean annual rain days are about 60 days with the mean annual temperature of approximately 27^0C.

Table 3.1 Monthly Mean Climatic Condition of Koko Town

Months	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Temp. °C	25	27	31	31	29	28	26	26	26	27	26	24	
P mm	0	0	2	23	107	114	165	254	226	86	0	0	977
D	145	149	200	169	70	39	0	0	0	5	53	98	
S	0	0	0	0	0	49	143	104	0	0	0	0	
PE	186	169	215	198	178	154	116	111	122	145	157	139	
AE	41	20	15	29	108	115	116	111	122	140	98	61	

Source: World Weather and Climate Information (2013). http://www.google.com

Temp. °C =Temperature; P mm = Rainfall in millimeters; D = Water deficit; S = Water surplus; PE = Potential evapotranspiration; AE = Actual evapotranspiration.

During the months of February to April the temperature of the area is high (see Figure 3.2). The environment becomes dry and the *Harmattan* blows and drifts solid waste here-and-there in the communities. During the rainy season (particularly May to September), solid waste in the area clog the waterways, gutters, and drainages within the town and consequently causes an annual flooding and it scattered solid waste.

3.1.5 Hydrology of Koko

The ground water in the study area occurs under the normal water table conditions (10 meters). The water has been exploited through numerous wells and boreholes. The town is

also endowed with several surface water including River Koko, Koko dam, several ponds, and marshes. Solid waste dump sites might therefore easily pollute the underground water sources through leaching or infiltration particularly in the rainy season. Moreover, the surface water might also suffer from solid waste being transported by storm-water during the rainy season.

3.1.6 Socio-Economic Activities in Koko Town

Koko is located in the center of Kebbi State where people come to the town from many towns and villages for schooling, job oppotunities, marketing, purchasing of consumer products, *Jumu'at* and *Sallah* celebration among others. Koko Town performs residential, commercial, institutional and urban agricultural functions. Therefore, the land use is directly and indirectly affecting solid waste generation in the study area.

3.2. Methods

3.2.1 Data Requirements

The study obtained the following data from sampled respondents: basic socio-demographic data, the period they live in Koko; types of solid waste generated in Koko; waste disposal methods; whether or not respondents are participating and willing to keep on participating in solid waste management processes; whether or not KBLGC has ever invited them to participate in waste management; whether the KBLGA is capable of actively managing the waste generated in the town, among others.

3.2.2 Tools for Data Collection

The tools employed for data collection include: questionnaire and Focus Group Discussion. The selection of the respondents for questionnaire administration was done by means of

simple random sampling technique. Table of random numbers was used to select 398 households in the township. Therefore, each head of household in the town was given an equal chance of being selected. In a situation where the head of the household was absent, a representative was asked to stand in for the head of the household.

Koko-Besse Local Government's house-to-house Polio Immunization record (2016) revealed that Koko town has 11,533 households on the register. This served as sampling frame for the study. The sample size of the respondents selected for the interviews was computed using the Yamane (1967) formula as follows:

$n = N/1+N (e^2)$ Where: N = Study population, e = marginal error and n = Sample size.

Thus, 398 respondents were selected from the 11,533 heads of the households in the study area for questionnaire administration. Another set of 8 people were purposively selected for Focus Group Discussion, 5 from 5 different locations in old areas and 3 from 3 different new areas in Koko. Seven out of the 8 selected people were heads of their households while 1 represented the head of his household. The Focus Group Discussion was completed within 1 hour 5 minutes. It was conducted using vernacular (Hausa) so that the participants could express their opinions without Language barrier. The FGD was transcribed and later translated to English language for analysis. The researcher consulted Polio Immunization supervisors in the town and four experienced Polio Immunization workers were engaged and trained on the aim and objectives of the study and appropriate ways to approach the respondents. They were also taught on where, when and how to reach the respondents. The research assistants were frequently supervised by the researcher. On FGD, the whole process was recorded using Android phone, the recordings was transcribed and translated in English.

3.2.3 Method of Analysis

The data generated from respondents was coded and processed using SPSS for descriptive statistics. Chi Square (χ^2) and Phi (φ) tests were used in data analysis. The data generated from FKG was classified and supported findings generated from questionnaire. The data was cross tabulated and to analyze the strength of relationships that exist between variables that were given special attention and an in-depth analysis were assessed and determined.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

The data was collected from 398 respondents using self-administered questionnaire on 28 assorted questions categorized into: socio-demographic characteristics of respondents; solid waste generation by residents; solid waste management practices and respondents' rating of the Koko-Besse Local Government Authority (KBLGA) that manages solid waste in that town. The data collected was processed to generate frequency distribution. Moreover, important variables were cross tabulated to generate hidden relationships and to determine strengths of associations between variables. Sub-sections 4.2 up to 4.5 present the results.

4.2 Socio-Demographic Characteristics of Respondents

Result on socio-demographic characteristics of respondents is presented in Table 4.1. The results on age reveal that 82% of respondents are above 36 years, while the rest (18%) are below this age (Table 4.1). Secondly, results on gender demonstrate that 96% of respondents are males as compared to 4% who are females as shown on Table 4.1. Thus, majority of the respondents are males and they might easily collaborate with KBLGA to manage solid waste in their neighborhoods. Thirdly, result on educational level of respondents reveals the following information: 72% of the respondents have attended at least Primary/Islamic/Secondary Schools while the rest 28% attended tertiary institution (Table 4.1). Figure 4.1 also reveals that 57% (227) are engaged in agro-related activities especially farming and sedentary herding while 80 (20%) are traders; some 12% (47) are civil servants while the rest (44) are artisans. This clearly shows that majority of the households in Koko town are farmers and sedentary herders.

Statistical analysis on the neighbourhood where respondents reside reveals that 67% (266) of respondents are dwelling in older neighbourhoods, while 33% (132) are living in newly developed areas of the town (Table 4.1). The analysis on residents' indigene status reveals that 81% (323) were born in Koko, while the rest 19% are not natives of the town as presents in table 4.1.

Table 4.1: Socio-Demographic Characteristics of Respondents

Variables	*F*	*%*
Age of Respondent		
Below 36 Years	70	18
Above 37 Years	328	82
Total	398	100
Gender of Respondent		
Male	383	96
Female	15	4
Total	398	100
Educational Level		
Primary/Islamic/Secondary School	288	72
OND/NCE	96	24
HND/Degree and Above	14	4
Total	398	100
Location of Residence of Respondent in Koko town		
New Developed Area	132	33
Old Town	266	67
Total	398	100
Indigene ship of Respondent		
Born in Koko	323	81
Migrated to Koko	75	19
Total	398	100

Source: Field Survey, 2016.

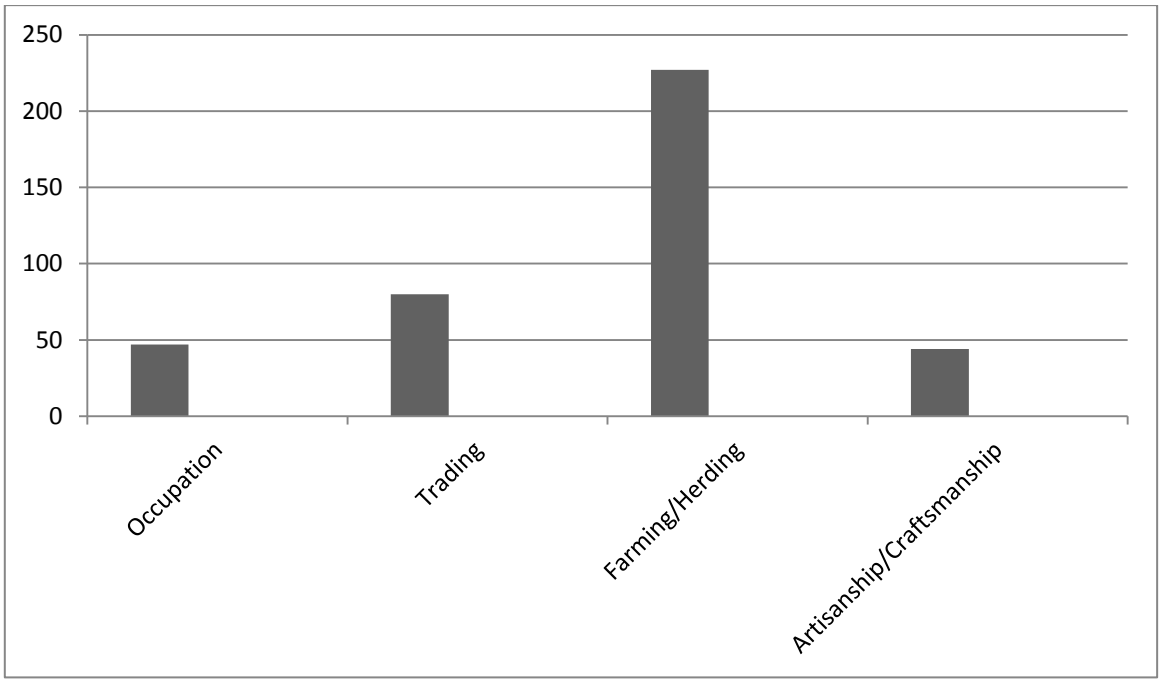

Figure 4.1: Occupation of Respondents.
Source: Field Survey, 2016.

4.3 Solid Waste Generation by Residents

Data on solid waste generation in Koko was analyzed and presented in Table 4.2. Data analysis on the type of waste the respondents normally generate on a daily basis reveals that 70% (278) generate feedstuff compared to 28% (111) who produce food-related waste; the rest produce waste from plastics, metallic and wood (Figure 4.2). This statistic clearly shows that most of the residents in Koko generate animal feed waste. This situation is attributable to high concentration of farmers and sedentary herders residing in the town.

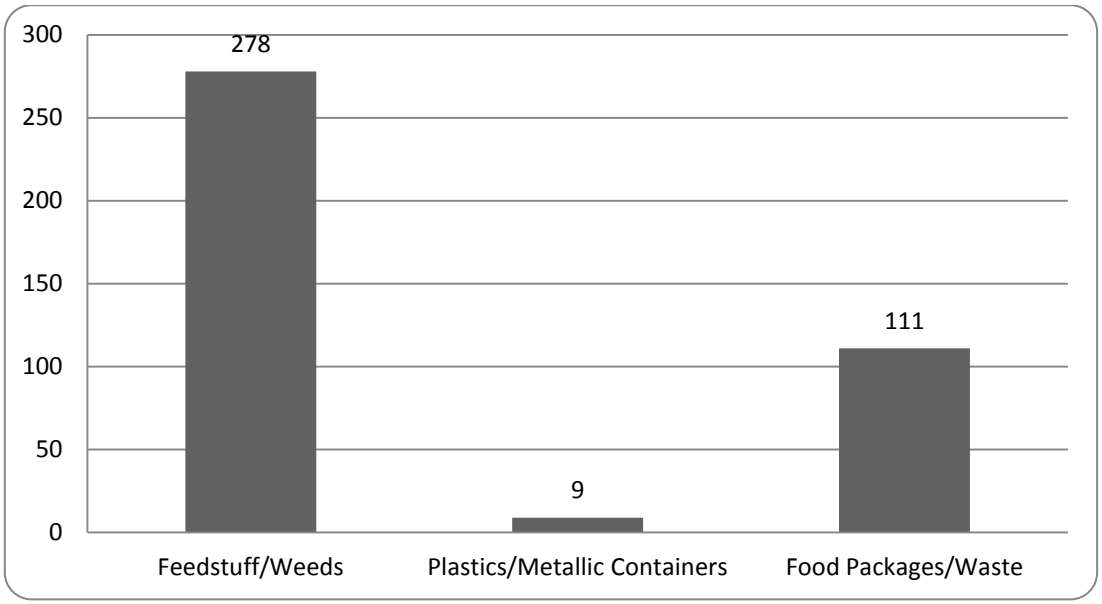

Figure 4.2: Type of Waste Respondents generate.
Source: Field Survey, 2016.

Analysis on type of dump sites respondents use to dump their waste reveals that 75% (299) of households use community dumping sites that are essentially private or communally-owned; 21% (83) avail themselves of dumping sites provided by KBLGA; the rest dump their waste in drainage channels, gullies, open spaces and road sides which literature calls: anyhow and anywhere method (Figure 4.3). This information suggests that the KBLGA has been unable to provide enough dumping sites in the study area.

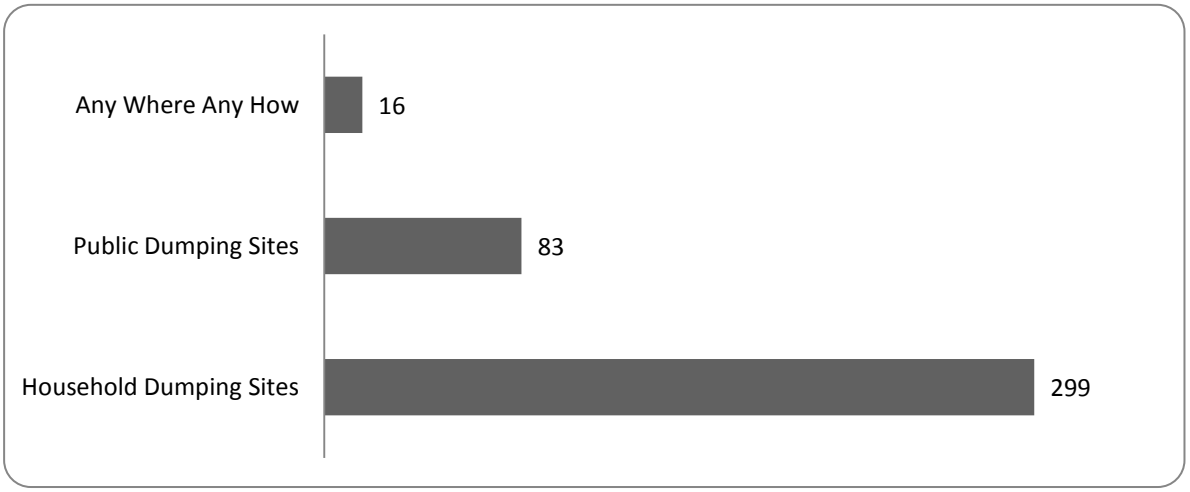

Figure 4.3: Types of Dumping Site used by Respondents.
Source: Field Survey, 2016.

The analysis on types of containers the respondents use to store their waste before disposing them shows that 75% (298) use metallic or plastic containers while 12% (49) dump their waste on the bare ground in their courtyards; the rest store it in sacks and baskets and keep them near places of convenience in the house (Table 4.2). This shows that majority of respondents use metallic/plastic containers to store their solid waste before taking it to dumping sites. This revelation is quite welcome and indicates that residents in Koko have at least some fair knowledge of how waste is safely handled before disposal. The result from FKG on how residents handle the waste they generate before disposing it to dump sites reveals that most of the residents especially in new neighborhoods store it in old buckets, basins or on bare grounds where it remains for some days before taking it to dump sites. One of the participants said that ‘‘*many of the households in old town are not storing the waste they generate in any receptacle, rather they directly take the waste to the dump site because the dumping sites are not far to reach.’’*

Results on duration the waste kept by residents before disposal to dump sites reveals that 57% (227) store their waste for one to three days; 25% (99) preserve it for up to 4 to 7 days while the rest 18% (72) store waste for more than a week. By implication, majority of the residents are already informally participating in solid waste management as they keep the waste they generate for some few days and do not dump it anyhow and anywhere. Analysis on number of dump sites available in respondents' residential area reveals that 79% (315) have more than six (6) dump sites, but 21% (83) said they have less than 6 (Table 4.2). Therefore, most of residential areas in the town have at least 6 dump sites. On the average distance that respondents walk to dump their waste the result shows that 87% (348) walk for less than 200 meters while 13% (50) said they walk 200 meters (Table 4.2). Majority of residents in Koko have dump sites quite close to their residences. Results on hygienic status of dump sites reveals that 85% (340) of dump sites are not sanitized, while 15% (58) said that theirs own are

hygienic (Table 4.2). Thus, respondents perceive that most of the waste dumps in the study area are not hygienic.

Table 4.2 Variables Related to Solid Waste Generation by Residents

Variables	*F*	*%*
Receptacle Used to store Solid Waste before Disposal		
Sack	32	8
Basket	19	5
Metal/Plastic Containers	298	75
Floor/Bare Surface	49	12
Total	398	100
Duration the Waste is Kept before Disposal by Respondent		
1-3 Days	227	57
4-7 Days3	99	25
More than a Week	72	18
Total	398	100
Number of Dump Sites in Respondent's Area		
Less than 6 Dump Sites	83	21
More than 6 Dump Sites	315	79
Total	398	100
Average Distance Respondent walks to Dump Waste		
More than 200 Meters	50	13
Less than 200 Meters	348	87
Total	398	100
Rating of Hygienic State of Dump Site		
Hygienic	58	15
Not Hygienic	340	85
Total	398	100

Source: Field Survey, 2016.

When the interviewees were asked during the FKG on how convenient the dump sites are in terms of locations and distance from houses. Majority of them responded that they are not convenient with the locations of dump sites in their community. They suggest that if government could provide them with dump sites in their community, they would stop dumping their solid waste very closely to their residences. They argue that lack of sensitization/awareness campaign and scarcity of public dump sites are among the contributory factors to the higher concentration of household dump sites in the study area. Some of them keep on the view that lack of public and community dump sites has been the reason why community has no option other than to dump the waste at any space available to

them within or in front of their houses. Therefore, if government provide them with dump sites they would dump the waste they generate there. Consequently, they would compete in collecting manure therefrom. Thus, if KBLGA performed and carry out its duty of managing waste in the town it would be very easier for the government to impose laws and regulations to the community concerning solid waste management practices.

Some interviewees said they cover less distance to dump their waste, because most of the houses have dump sites within their houses or very close to their entrances. But two of the interviewees stated that some people are convenient with their dumping sites as they own these dumping sites because they want to maintain the ownership of the waste they dump if turn to manure, so that they can evacuate it to their farm lands at the end of dry season.

4.4 Solid Waste Management Practices in Koko Town

Results on solid waste management practices in the study area are presented in Table 4.3. Analysis on the agency that evacuates waste from respondents' dump sites shows that 58% (231) are evacuated by individual households; 40% (159) are evacuated by the community while 8 (2%) are done by KBLGA (Figure 4.4). Conclusively, Koko residents are the agents responsible for evacuating waste from dumping sites in the township. Therefore, they are in a sense participating in solid waste management.

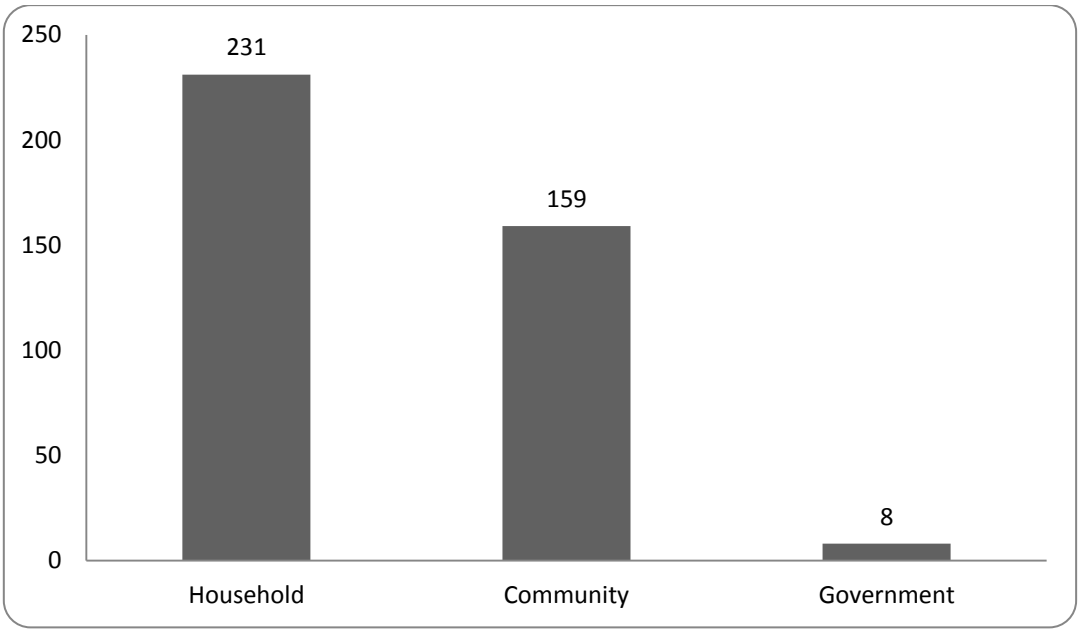

Figure 4.4 Agency that evacuate Waste from Respondents' Dump Sites.
Source: Field Survey, 2016.

Results on the time intervals the dump sites are cleared of waste shows that 311 (78%) of respondents said that dump sites are cleared infrequently (occasionally), while 22% stated that dump sites are cleared on a monthly basis (Table 4.3). Thus, wastes at dump sites in the town are not evacuated frequently. This finding suggests that Koko-Besse Local Government Authority has been inefficient in evacuating solid wastes from dump sites.

Table 4.3 presents results on waste treatment at dump site before evacuation for final disposals where it shows that 61% (241) employ composting, while 39% (157) engage in incineration. This shows that most of the people interviewed had been composting waste. Indeed, residents were seen by the researcher collecting manure from the dump sites for farm application during data collection. As a result, the residents may easily be persuaded to actively and formally participate in solid waste management in the town. Results on whether residents collect manure from dump sites reveals that 90% (357) do that while 10% (41) said no a shown on Table 4.3 below. Thus, most of the dump sites serve as source of compost manure to farmers.

When question asked during the FKG on how dump sites in the town are evacuated? Majority of respondents reveals that most of the dump sites are cleared at the end of dry season by household members to revitalize their farmlands or sell to other farmers. The farmers that collect manure from the dump sites usually segregate it from other waste. The waste segregated can be burnt and finally mix-up with the manure. Table 4.3 shows that 64% (255) practices segregation and retain part of their waste while 36% (143) do not. Presumably, most of residents in the study area segregate and retain parts of their waste for future use; they are thus practicing in recycling. This fact is another indication that several residents might heed to the call to participate in managing waste in the town.

Results on solid waste reduction at the source of generation reveals that 74% (296) are doing some reduction of solid waste at the source of generation; however, 21% (102) of respondents said they do not (Figure 4.3). Therefore, majority of respondents practice waste reduction at source of their generation (farms, markets, shops) before disposal. In this regard residents have informally adopted the idea of solid waste reduction at the source of generation. Analysis on solid waste scavenging in the study area reveals the following result: 68% (272) stated that scavenging is promising SWM in the study area as a result they encourage it. But 32% (126) said it is not encouraging SWM in the town (Table 4.3). Thus, majority of residents supported the idea of scavenging solid waste in Koko. Results on whether respondents prepare solid waste for easy collection and safe disposal reveals that 66% (264) do so, while 34% (134) said they do not (Table 4.3). Consequently, majority of interviewees prepare waste at a courtyard before disposal to dump sites

Results from FKG on the roles that people in Koko play to manage the waste they have generated on daily basis, reveals that most of the people living in old neighbourhoods usually participates in managing the waste they have generated on a daily basis. The respondents

stated that there is a high concentration of elderly people who cares much about sanity of their surroundings. One of the respondent said that ‘‘*I am directing my family to sweep the entire house every day and dump the waste generated on my household dump site. And I do not keep domestic animals in my house because the waste they would generate would litter the compound.’’* According to them, if not because of the efforts of residents in old neighbourhoods in managing the waste they generate the areas will be filled up with solid waste. This is because the volume of waste generated is high due to the large number of people residing in those areas. Another participant said that ‘‘*People in Koko are locally composting the waste on their dump sites which they eventually evacuate to their farmlands.’’*

The participants are of the same opinion that Koko community are segregating some valuable materials like metals, bottles, rubber and any other valuable items for sale to scavengers. And the waste from biodegradable items is composted and turned in to manure and afterward they evacuate it to their farms or sold to other farmers. In commercial areas the places are swept on a daily basis before the business of the day kick start, each trader paying some fee (=N=20-50) to clean his part. They also stated that farmers in the town are involved in waste reduction at the source of generation by threshing their harvests at farm or taking them to threshing centres (*masussuki*) which are usually situated at the outskirt of the town. The leftover generated from the threshing is in most instances left at the threshing centers or at the farm.

Table 4.3: Solid Waste Management Practices in Koko

Variables	*F*	*%*
Time Intervals Waste is evacuated from Dump Sites		
Monthly	87	22
Occasionally/Infrequently	311	78
Total	398	100
Waste Treatment at the Dump Site before Evacuation		
Composting	241	61
Incineration	157	39
Total	398	100
Compost Collection by Farmers from the Dump Site		
Compost is Collected	357	90
Compost not Collected	41	10
Total	398	100
Segregation or Retention of Solid Waste for Future Use		
Respondents who do not segregate Waste	255	64
Respondents who segregate Waste	143	36
Total	398	100
Retrieval of Useful Items from Waste by Scavengers		
Useful Items Sold to scavengers	272	68
Useful Items not Sold	126	32
Total	398	100
Preparation of Waste before Disposal		
I Prepare Waste	264	66
I do not Prepare Waste	134	34
Total	398	100

Source: Field Survey, 2016.

Results on whether residents are ready to participate in solid waste management reveals that majority (78%) are ready to participate; however, 22% (88) said they are not ready as shown in Figure 4.5. This shows that, most of the residents are ready to team up to manage solid waste problem in the study area.

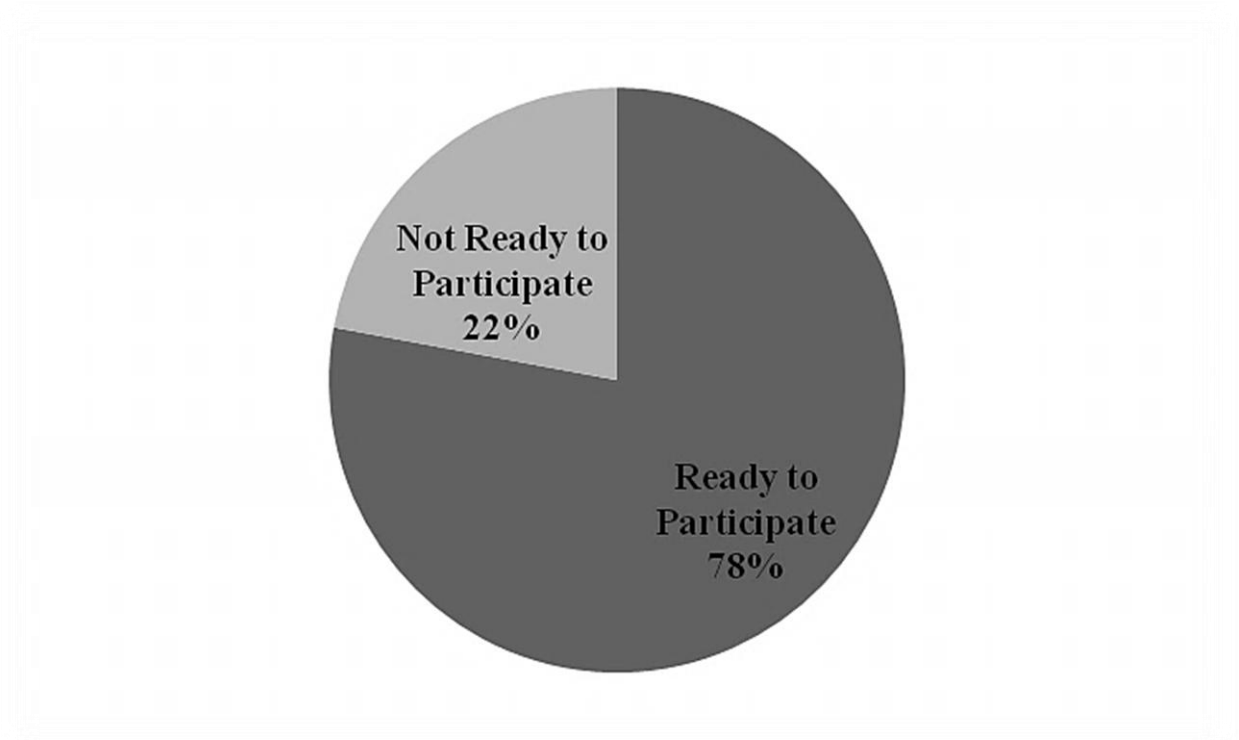

Figure 4.5: Residents' Readiness to participate in Managing Waste.
Source: Field Survey, 2016.

The participants on Focus Group Discussion were asked on residents' readiness to collaborate with KBLGA in managing solid waste generated in Koko; they all replied that "we are ready to collaborate with the local government to effectively manage the waste generating in our community on daily basis". Some of them stated that Koko community usually cooperates to the directives of both the KBLGA staff and the district head to clean their surroundings and business places. Therefore, they are ready to participate more in managing the waste generated in Koko. Another respondent added that they require sensitization, supports and empowerment from government especially by providing them with dump sites and evacuating them regularly. He added that if government plays its role sufficiently the community will participate more than they are doing now and they will keep on participating, because the entire process is directly benefitting the residents in the town. They express their willingness to do anything that will improve environmental sanitation.

4.5 Respondents' rating of KBLGA in Managing Solid Waste

The rating of KBLGA's capacity to manage solid waste in Koko Township was analyzed and presented in Table 4.4 and 4.5. Results on whether KBLGA is capable of managing solid waste in the study area reveals that 60% of the interviewees said that KBLGA does not possess the capacity to manage the waste generated on a monthly basis, while 40% said the opposite (Table 4.4), but they cited corruption as the basis of the poor performance as at now. Summing up, majority of residents interviewed assessed KBLGA as being incapable of managing solid waste in the town. This finding reveals the suspicion of this study that KBLGA is inept to collect and safely dispose solid waste generated in the town on a monthly basis.

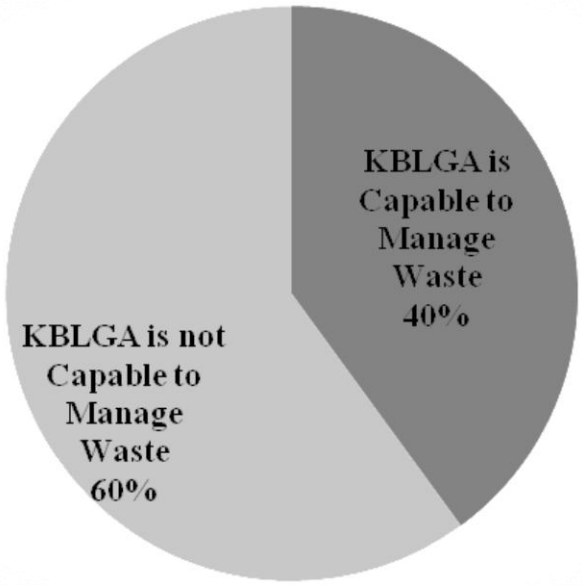

Table 4.6 Capability of KBLGA to Manage Solid Waste.
Source: Field Survey, 2016.

On whether most residents in Koko perceive that collaboration or partnering with their local government authority to manage solid waste in the town might yield significant results Table 4.5 reveals that 85% (340) of respondents think it could effectively solve the solid waste

problem in the town, but 15% (58) said the local government should be gingered by Kebbi state government to wake up. Consequently, residents in Koko believe that KBLGA can collaborate with Koko community to solve the solid waste issues in the town. Analysis on whether solid waste mismanagement caused health problems on residents shown that 74% (296) said they have experienced several illnesses emanating from solid waste mismanagement, the rest said they have not experienced that (Table 4.5). Therefore, majority of respondents think solid waste mismanagement in the town is adversely affecting their health condition. This situation might necessitate Koko residents to actively participate in managing solid waste in the town.

Results on whether KBLGA has been engaging residents to solve solid waste problem in the town reveals that 79% (314) said KBLGA has never engaged them in solid waste management; while the rest said KBLGA has in a way being engaging residents in solving solid waste problem in the study area (Table 4.5). Majority of residents thus indicate that KBLGA has never engaged them in managing waste.

Moreover, results on whether KBLG has been sensitizing residents on how to manage solid waste reveals that 85% (340) have not been reached on how to handle the waste safely (Table 4.5). It is thus easy to conclude that residents have not been sensitized by the KBLGA on how to handle solid waste safely. Table 4.5 shows analysis on whether respondents are satisfied with by KBLGA's performance with regards to solid waste management in Koko where 89% (355) said they are not satisfied. This reveals that majority of Koko residents indicate that KBLGA has been unable to perform its duty of managing waste in the town.

Table 4.4: Residents' Rating on how KBLGA is Managing Solid Waste

Variables	*f*	*%*
Whether KBLGA and Community Collaboration can manage Solid Waste in Koko		
Involving Residents will lead to Efficiency in Solid waste management	340	85
Involving Residents will not lead to Efficiency in Waste Management	58	15
Total	398	100
Opinion on whether Waste Mismanagement has affected their Health		
Yes	296	74
No	102	26
Total	398	100
Whether KBLGA involves Residents in Solid Waste Management		
Yes	84	21
Not involves Residents	314	79
Total	398	100
Whether KLGA sensitizes Residents on how to Manage Waste they generate		
Yes	58	15
No	340	85
Total	398	100
Respondents Assessment on KBLGA's managing of Waste		
Satisfactory	43	11
Not satisfactory	355	89
Total	398	100

Source: Field Survey, 2016

Results from FKG on how the KBLGA is managing solid waste in the study area reveals that personnel from the local government visit different areas in the town directing residents to clear the waste they dumped on the roadside or inside drainage. One of the respondents reveals that "residents were usually given notice, and the personnel usually come back after some days to checkmate if the residents comply with the directives". Some respondents said that "the KBLGA staffs are not given more attention to household dumping sites, but they concentrate on waste dumped on roads, in gullies or gutters". Another respondent stated that "they have been visiting traders at their shops and market stalls especially on weekly market days (Fridays) to ascertain whether they clean their vicinities or not. Remarkably, the traders are generally cleaning their surroundings before they start their trading. The traders usually pay =N=20-50 to cleaners as a fee for cleaning their surroundings".

Some of the interviewees argue that the KBLGA is not making any effort in supporting solid waste management in Koko town. “The LGA do not care with solid waste management practices in the town. But the district head is usually enlightening residents on dangers of solid waste mismanagement through the town crier. The town crier passes the massage to residents on issues concerning solid waste management in the town by directing the residents that dump solid waste in gutter or on the road shoulders to immediately evacuate it”.

4.6 Cross Tabulations

Tables 4.9, 4.10, 4.11 and 4.12 present cross tabulation results of the following variables: readiness of residents to participate in waste management in the study area, capability of KBLG to manage solid waste generated in Koko on a regular basis, whether KBLGA have been involving residents in solid waste management and whether KBLGA and community collaboration can solve solid waste problem in the study area. Firstly, the cross tabulation on readiness of residents to participate in solid waste management and types of waste generate by respondents reveals that 78% (310) are ready to participate in solid waste management; out of this fraction 59% (236) generate fodder waste, 17% (09) produce food related waste while the rest 1% (5) generate metallic and plastic wastes. The results indicate that there is a relationship between the type of waste generated in Koko and the readiness of residents to participate. When the cross tabulation was subjected to the φ test it yielded **φ** = .258, p = .000. Therefore, there is weak but positive association between the residents’ readiness to participate in solid waste management and the types of waste they generate. The reason for this is that the type of solid waste generated in the township is used by residents when it turned to manure.

Secondly, the cross tabulation on readiness of residents to participate in waste management and type of dumping sites used by residents demonstrates the following information: 78% (310) of respondents said they are ready to participate in solid waste management; while the

rest said they will not. This shows that here is some relationship between types of dumping sites in the township and respondents' readiness to participate in solving solid waste problem in Koko. Further data analysis (φ test) yielded **φ** = .179, p = .002. Therefore, there is once more weak but positive relationship between the residents' readiness to participate in solid waste management and the types of dumping sites they use.

Thirdly, the cross tabulation on readiness of residents of Koko to participate in waste management in the future and the time waste is evacuated revealed that some 310 (78%) of respondents are ready to participate; out of this fraction 63% (251) said their dumping site are evacuated on occasional basis; 15% (59) say their dumping sites are evacuated on monthly intervals. This indicates that there is a relationship between readiness to participate in waste management and waste evacuation intervals. The φ test of the cross tabulation yielded **φ** = .128, p = .010. Therefore, there is a very weak association between respondents' readiness to participate in solving solid waste and the frequency of waste evacuation.

Fourthly, the cross tabulation on readiness of respondents to participate in waste management and type of waste treatment (control) carried out at dumping sites of by respondents revealed that 78% (310) are ready to participate; out of this percentage, 51% (201) said they practice composting; and 27% (109) said they do incineration. This statistic indicates that there is a relationship between respondents' readiness to participate to solve waste problem and type of waste treatment they practice before their dumping site are evacuated. The φ test on this variable yield **φ** = .165, p = .001. Concluding, there is weak but positive association between the residents' readiness to participate in solid waste management, and the techniques they apply to waste at their dumping sites.

Additionally, the cross tabulation of residents' readiness to participate in waste management and waste segregation revealed that again 78% (310) are ready to participate; out of this

proportion 48% (189) are those who segregate and retains part of their waste for future use while 30% (121) are those who do not segregates waste but rather they dispose up their waste entirely at dump sites. This demonstrates that there is a relationship between readiness to participate and the waste segregation. The φ test on the variable yield **φ** = .121, p = .015. Thus, it can be assumed that there is weak positive association between the residents' readiness to participate in solid waste management and segregation of solid waste by them for future use.

Table 4.5: Residents' Readiness to Participate in Waste Management and some Significant Variables Cross Tabulation.

Variables Cross Tabulated	*df*	*φ*	*p*
Readiness to Participate and Type of Waste	2	.258	.000
Readiness to Participate and Type of Dumping Site	2	.179	.002
Readiness to Participate and Time Frequency Waste Evacuated	1	.128	.010
Readiness to Participate and Waste treatment on Dumping Site	1	.165	.001
Readiness to Participate and Waste Segregation for Future Use	1	.121	.015

Source: Field Survey, 2016.

4.7 Cross Tabulation on whether KBLG is capable of Solving Solid Waste Problem with Certain Significant Variables.

The capability of KBLGA to manage solid waste generated in the township on regular basis was cross tabulated with significant variables as shown in tables 4.8and 4.9 below. Firstly, the cross tabulation of and the types of dumping site used by respondents revealed that 60% (239) of residents believe KBLG is not capable of solving solid waste problem in the township; out of this fraction, 48% (190) users of household dumping sites; 11% (45) are users of community-dumping sites, while the rest 1% (4) are those who dump their waste anywhere and anyhow. A relationship thus exists between whether KBLG is capable to manage the waste generated in Koko, and type of dumping sites the respondents use. The φ test of these variables yielded **φ** = .165, p = .004. A weak but positive association exists between the types

of dumping sites used by residents and capability of KBLG to manage solid waste generated in Koko Township.

Secondly, the cross tabulation of and whether KBLG and community collaboration can solve solid waste problem in Koko revealed that 60% (239) of respondents see KBLG as incapable to solve solid waste problem in Koko Township; out of this fraction 54% (214) said KBLG/community collaboration can solve solid waste problem in Koko; 6% (25) said KBLG/community collaboration would not solve solid waste problem in the town. The φ test yielded **φ** = .143, p = .004. Therefore, there is no association between KBLG/community collaboration in solid waste management and whether KBLGA is capable to solve solid waste problem in Koko.

Thirdly, the cross tabulation of and whether KBLG is involving residents in solid waste management practices ($\mathbf{X_{24}}$), indicates that 60% (239) believe KBLG is not capable to solve solid waste problem in Koko; out of this fraction 56% (223) are those who reported KBLG is not involving residents in solid waste management practices. The cross tabulation of data produced **φ** = .433, p = .000. This indicates that there is a relationship between capability of KBLGA in waste management practices and involving residents in its management process. Moreover, there is moderate and positive association between involving residents in waste management and capability of the authority to solve solid waste problem in Koko Township.

Table 4.6: Whether KBLGA is capable of Solving Solid Waste Problem in Koko and some Significant Variables Cross Tabulation

Variables Cross Tabulated	*df*	*φ*	*p*
KBLG's Capability to Manage Solid Waste and Types of dumping Site	2	.165	.004
KBLG's Capability to Manage Solid Waste and Collaborating with Residents can lead to the Solution of Waste Problem	1	.143	.004
KBLG's Capability to Manage Solid Waste and whether KBLG is Involving Residents	1	.433	.000

Source: Field Survey, 2016.

4.8 Cross Tabulations whether KBLGA is Involving Residents to Solve Solid Waste Problem in Koko and some Significant Variables

A cross tabulation of whether KBLG is involving residents in waste management and gender of respondents revealed that 79% (314) of residents said KBLG is not involve residents in solid waste management 77% (306) of this fraction are males; while 2% (8) are females. The φ test yielded **φ** = .124, p = .013. Therefore, there is weak association between whether KBLG is involving residents in waste management and gender of respondents. Secondly, when the cross tabulation of whether KBLG is involving residents in waste management and the duration the respondents keep their waste before disposal was analyzed it revealed the φ statistic **φ** = .574, p = .000. Concluding, there is strong association between whether KBLG involves respondents in managing solid waste and duration the respondents kept their waste before disposal.

Thirdly, the cross tabulation of whether KBLG is involving residents in waste management and number of dumping sites in respondents' area of residence revealed a φ statistic **φ** = .614, p = .000 (see Table 4.11). Conclusively, there is very strong association between whether KBLGA involves residents in waste management and number of dumping sites in respondents' areas of residence. Fourthly, the cross tabulation between whether KBLG is involving residents in waste management and the agency that evacuates the waste from respondents' dumping sites a φ statistic yield **φ** = .229, p = .000. Thus, there is only a weak association between involving residents by KBLG to solve solid waste problem in the town and agency that evacuates waste from residents' dumping sites at present. Additionally, the cross tabulation of whether KBLG is involving residents in waste management and capability of KBLG to manage solid waste in Koko revealed that a φ test is **φ** = .433, p = .000.

Therefore, there is strong positive association between involving residents in managing solid waste and capability of KBLGA to manage waste generated in the township.

Moreover, the statistic on cross tabulation between whether KBLG is involving residents in waste management and KBLG/community collaboration would lead to proper solid waste management in Koko shows that a φ test yielded **φ** = .292, p = .000. Hence, there is moderate association between involving residents to manage waste and KBLGA/community collaboration in waste management in Koko. Furthermore, the result of cross tabulation between whether KBLG is involving residents in waste management and whether KBLGA is sensitizing residents on how to manage the waste produced a φ analysis as follows: **φ** = .310, p = .000 as shown in Table 4.11. In view of that, there is moderate association between whether KBLGA involved residents in managing waste and sensitization of residents on how to properly manage the waste in the town.

Table 4.7: Whether KBLG is Involving Residents to Solve Solid Waste Problem in Koko and Some Significant Variables Cross Tabulations.

Variables Cross Tabulated	*df*	*φ*	*p*
Involving Residents by KBLG in Waste Management and Gender of Respondent	1	.124	.013
Involving Residents in Waste Management and Duration the Waste is Kept before Disposal	2	.574	.000
Involving Residents in Waste Management and Number of Dumping Sites in Respondent's Area	1	.614	.000
Involving Residents in Waste Management and Agency Responsible for Waste Evacuation	2	.229	.000
Involving Residents in Waste Management and Compost Collection by Farmers from Respondent's Dumping Site	1	.149	.003
Involving Residents in Waste Management and Retrieval of Useful Items by Scavengers	1	.193	.000
Involving Residents in Waste Management and KBLGA's Capability to Manage Solid Waste	1	.433	.000
Involving Residents in Waste Management and Collaboration with Residents can lead Solution to Waste Problem	1	.292	.000
Involving Residents in Waste Management and KBLGA Sensitize Resident on how to Solve Waste Problem	1	.310	.000
Involving Residents in Waste Management and Preparing Waste for Easy Collection and Safe Disposal	1	.160	.001

Source: Field Survey, 2016.

4.9 Cross Tabulations between KBLG/Community Collaboration can solve Solid Waste Problem with Certain Significant Variables

Whether KBLG/community collaboration will solve solid waste problem in the township was cross tabulated with significant variables in tables 4.12 and 4.13 below. Firstly, the cross tabulation of whether KBLG/community collaboration will solve solid waste problem in the township and duration that the respondents keep their waste before disposing it revealed that 85% (340) of respondents suggest KBLGA/community collaboration can solve solid waste problem in Koko. Out of this fraction, 51% (203) kept their waste for less than four (4) days; 22% (88) retained the waste within 4-7 days; while the rest 12% (49) preserve it for more than a week. The φ test given **φ** = .314, p = .000. With regards to this a weak positive association exist between whether KBLGA/community collaboration in solid waste management can proffer solution to waste problem in Koko and the duration the respondents keep waste before disposing it to their dumping sites.

Secondly, the cross tabulation of whether KBLG/community collaboration will solve solid waste problem in the township and number of dumping sites in respondents' areas of residences submit that 85% (340) said KBLGA/community collaboration can solve the waste problem. Out of this ratio, 72% (287) have more than six (6) dumping sites in their areas of residence while 13% (53) enjoy less than six. The cross tabulation shows that the φ analysis was **φ** = .314, p = .000 (see Table 4.12). This indicates that there is a relationship and weak positive association between the KBLGA/community collaboration in waste management and the number of dumping sites in respondents' area of residence. Thirdly, the cross tabulation of and distance the respondents walk to dump waste unveil that 85% (340) said KBLGA/community collaboration can solve solid waste problem in the town. Out of the percentage, 77% (307) walk less than 200 meters to dump their waste while 8% (33) walk

more than 200 meters to dispose-off their waste. The cross tabulation of this variables revealed **φ** = .209, p = .000. This signifies that weak positive association between the KBLGA/community collaboration in waste management and the distance respondents move to dump the waste.

The cross tabulation between) and compost collection from respondents dumping sites revealed that 85% (340) empathize that KBLGA/community collaboration in solid waste management will provide solution to solid waste in the town. 79% (313) said compost manure is collected from their dumping sites while 7% (27) said it is not collected from their sites. The cross tabulation revealed **φ** = .188, p = .000. Therefore, there is weak positive association between whether KBLGA/community collaboration can solve solid waste problem and compost collection from respondents' dumping sites in the township. Equally cross tabulation was analyzed on whether KBLG/community collaboration will solve solid waste problem in the township and whether KBLG is capable to manage the waste in Koko it revealed that 85% (340) said KBLGA/community collaboration can solve solid waste problem in the town. But 54% said KBLG is not capable to manage waste on regular basis while 32% (126) said the KBLGA is capable to manage it. The φ test yielded **φ** = .143, p = .000. Accordingly, there is weak positive association between the KBLG/community collaboration in solid waste management and the capability of KBLGA to manage the waste generated in the township on regular basis.

Table 4.8: Whether KBLGA/Community Collaboration solve Solid Waste Problem with Certain Significant Variables Cross Tabulations.

Variables Cross Tabulated	*Φ*	*df*	*P*
KBLGA/community Collaboration can Solve Solid Waste Problem and Duration of Waste keep before Disposal	.231	2	.000
KBLGA/community Collaboration can Solve Solid Waste Problem and Number of Dumping Sites in Respondent's Area	.314	1	.000
KBLGA/community Collaboration can Solve Solid Waste Problem and Distance move to Dump Waste	.209	1	.000
KBLGA/community Collaboration can Solve Solid Waste Problem and Agency Responsible for Evacuating Waste	.187	2	.001
KBLGA/community Collaboration can Solve Solid Waste Problem and Compost Collection by fro Dumping Sites	.188	1	.000

Source: Field Survey, 2016.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary of Findings

This chapter presents a precise summary of the research findings and conclusion of the study followed by recommendations of the researcher.

i. Majority of the respondents are above 35 years and most of them are males.

ii. Most of them are farmers who are residing in old residential areas which is dominated by indigenes of the town.

iii. They generated large proportion of bio-degradable solid waste; they gather it in metallic/plastic containers and keep it for few days before disposing it on the household dumping sites.

iv. Most of the residents stored the waste they have generated on a daily basis in receptacles for 1-3 days before disposing it.

v. The communal dump sites are available here-an-there in the town.

vi. Majority of respondents are not comfortable with the locations of dump sites in their community.

vii. Residents in the study area are participating in managing the waste they have generated.

viii. Koko community segregates some valuable materials and sell to scavengers.

ix. Solid waste from biodegradable items is composted by residents and when turned to manure they evacuate it to their farm lands or sold to other farmers in the town.

x. The residents are commonly responsible for evacuating their dump sites because the KBLG is not performing.

xi. The residents evacuate the dump sites occasionally. But before the evacuation they used to compost or burn it and evacuate it to their farms as manure.

xii. They usually segregate and retain part of their waste for future use.

xiii. Most of the residents practice waste reduction at the source of generation and believe in the idea of waste scavenging; as such they proved their readiness to keep participating in managing waste in the future.

xiv. People in the study area prepare solid waste for easy collection and safe disposals. In line with this, Koko residents are currently participating in solid waste management.

xv. A large proportion of respondents reported that KBLGA is inept (not capable) of managing solid waste generated in Koko town at present. Primarily because; majority of them deemed KBLGA is not practically performing in managing the waste in the town.

xvi. The respondents suggest that the KBLGA and community should collaborate to manage the waste in the town. This is because the residents suffered from several ailments caused by solid waste.

xvii. The KBLGA staffs are not supervising household dumping sites but they are only after the residents that are dumping their waste on inappropriate locations.

xviii. Residents were neither involved nor sensitized by the the local government to manage the waste in the township.

xix. The respondents stated that they are not satisfied with the performance of the KBLGA in managing the waste generated in the study area. Therefore, the performance of the KBLGA in managing solid waste in Koko is unquestionably insignificant and ineffective at present.

5.2 Conclusion

The study concludes that the residents in the study area are participating in managing the waste generated in the town. KBLGA is not capable of collecting and safely disposing solid waste generated in the town on monthly basis. Therefore, the study also observed that Koko-Besse Local Government in collaboration with Koko community can properly manage solid waste generated in the township. Another finding from this study revealed that residents in Koko Township are ready to participate in managing solid waste generated in the town when formally involve by the local government council. As majority of residents in Koko town are presently participating in managing the waste in their surroundings.

Consequently, Koko community is informally participating in solid waste management and majority of them are ready to collaborate with government for future solid waste management in the town if formally involved by Koko-Besse Local Government Authority

5.3 Recommendations

Considering the result of this study, certain measures are recommended so that effectiveness and sustainability of community participation in solid waste management prosper in the study area. The recommendations are as follows:

- KBLGA should provide residents of the study area with modern tools and receptacles so as to ease and enhance their capacity in solid waste management practices.
- KBLGA should enlighten residents of the community on proper solid waste management practices in order to achieve effective community participation in the town.
- KBLGA should routinely supervise the affairs of solid waste management practices in Koko in order to motivate and monitor solid waste management practices in the town.

- KBLGA should provide modern public dump sites at appropriate locations in the town so as to ameliorate the habit of dumping waste haphazardly on communal dump sites in the township.
- KBLGA should collaborate with Koko community in carrying out solid waste management in the town.
- Generally KBLGA should empower residents, collaborate and negotiate with them on challenges and also delegate certain duties to communities to ensure effective and sustainable self-management of solid waste in the study area.

References

Abdullahi, R. B. (2013). Solid Waste Management Practices in Kebbi State Nigeria: Problems and Prospect. *International Refereed Journal of Engineering and Science (IRJES) 2 (2): 48-54*

Abiodun, P. B. (2003). Privatization of Waste Disposal: Issues and Prospects. annual scientific conference Lagos.

Adejobi, O.S. and Olorunnimbe R.O. (2012) Challenges of Waste Management and Climate Change in Nigeria: Lagos State Metropolis Experience. *African Journal of Scientific Research 7 (1): 346-362*

Adewole, A. T. (2009). Waste Management towards Sustainable Development in Nigeria: A Case Study of Lagos State. *Internal NGO Journal Vol. 4 (4): 174-176.* Retrieved on 28/04/2013, from http://www.academicjournals.org/INGOJ

Adewole, A.T. (2006) Changing the Face of My Local Community through Waste to Wealth Program in Lagos State, Nigeria. Pp. 9-12.

Agwu, M .O. (2012).Issues and Challenges of Solid Waste Management Practice in Port-Harcourt Metropolis, Nigeria. Behavioral Perspectives. *American Journal of Social and Management Sciences 3 (2): 83-92*

Ahmed, S. A. and Ali M. (2004) Partnership for Solid Waste Management in Developing Countries: Linking Theories to Realities. *Journal of habitat International, 28. Pp. 467-479.* Retrieved on 04/01/2014, from www.elsevier.com/habitatint

Ajadike, J. C. (2001) Urban Solid Wastes: Problems and Management in Nigeria. *Geographical Perspectives on Environmental Problems and Management in Nigeria.* Enugu: Jamoe Publishers.

Alberta Environmental Protection, (2014). Taking Action through Backyard Composting to Reduce Household Waste. Action on Waste, Printed on Recycled Paper. Publication. No.1 (518). Retrieved on 23/02/2014, from www.environment.alberta.ca>waste>composting

Alexander, F. A., Gabreil, F. and Olusegun, O. (2012). Domestic waste management and Urban Residential Environment: Focus on Akure. *International Journal of Engineering and Technology 2 (5): 878-887*

Asi, E. N. (2013) Bottom-Up Approach to Sustainable solid waste Management in African Countries. Unpublished PhD. Thesis, Brandenburg University of Technology, Cottbus, Germany.

Awosusi, A. O. (2010). Assessment of Environmental Problems and Methods of Waste Management in Ado-Ekiti, Nigeria.*An International Multi-Disciplinary journal, Ethiopia. 4 (3b): 331-343*

Bolanle, A. O., Bashir, O.O., Omoighe, M.E., and Segun, O. (2012).Household Participation in Waste Disposal and Management, in Ijebu-Ode, Nigeria. *Journal of Human Ecology 40 (3): 247-254*

Borogo, G. A., Ali, C. and Bukar, A.G. (2012).Women and Solid Waste Segregation in Bauchi, Nigeria. *Journal of Environmental and Earth Science 2 (8)*: 25-45.

Choguill, M. B. G. (1996). A Ladder of Community Participation in Underdeveloped Countries.*Journal of Habitat 20 (3): 431-444*

Chukwuemeka, E., Ugwu, J., and Igwebe, D. (2012). Management and Development Implications of Solid Waste Management in Nigeria. *Asian Journal of Business Management, 4 (4): 352-358*

EPA (Environmental Protection Agency), (2009). Municipal solid waste Retrieved on 02/01/2014, from www.epa.gov/epaoswer/non-hw/muncpl/index.htm.

Federal Republic of Nigeria, (1999). The 1999 Constitution of the Federal Republic of Nigeria

Borogo G. A., Ali, C. and Bukar, A.G. (2012). Women and Solid Waste Segregation in Bauchi, Nigeria. *Journal of Environmental and Earth Science 2 (8)*: 25-45.

Haruna, A. U. and Basher, U.M. (2012). Solid Waste Management in Bauchi, Nigeria (Obstacles and Prospects) *Journal of Environmental Science and Resources Management 4: 96-107.*

Kumar, N. and Nandini, N. (2013). Community attitude, Perception and Willingness towards Solid Waste Management in Bangalore City, Karnataka, India. *International Journal of Environmental Sciences 4 (1): 87-95*

Mudzengerere, F.H. and Chigwenya (2012). Waste Management in Bulawayo City Council, Zimbabwe: Search of Sustainable Waste in the City. *Journal of Sustainable Development in Africa Vol. 14 (1): 228-244.*

Muhammad, M.N. and Manu, H.I. (2013) Gender Roles in In-formal Solid Waste Management in Cities of Northern Nigeria: A Case study of Kaduna Metropolis. *Academic Research International 4 (5): 142-153.*

Nations Online Project (2014).Administrative and Political Map of Nigeria. Source: UN Cartographic Section. Retrieved on 13/05/2014, from www.nationsonline.org.

Ogwueleka, (2009).Municipal Solid Waste Characteristics and Management in Nigeria. *Iran Journal of Environmental Health and Science 6 (3): 173-180.*
on Solid Waste Management.

Pervez, A. and Kafeel, A. (2013).Impact of Solid Waste on Health and the Environment. *International Journal of Sustainable Development and Green Economics 2 (1): 165-168.* Retrieved on 28/11/2013, from http://www.iiste.org,

Rodgers, M. (2011). *Fundamentals of Development Administration.* S.K. Publishers, London.

Sanusi, Y. A. (2010). Capacity Issues of Private Sector Participation in Urban Solid Waste Management in Nigeria. *Journal of Humanity and Social Sciences 5 (1): 07-18* IDOSI Publications.

Sardan, S. (2012) Solid Waste Management and Resource Recovery. Retrieved from http://www.Slideshare.net/waste-management.On 20th May, 2013.

United Nations Environment Programme, (2009) Developing Integrated Solid Waste Management Plan, Training Manual Volume 3. Targets and Issues of Concern for ISWM

United Nations Environmental Programme, (2012). Environmentally Sound Management of Solid Waste and Sewage-Related Issues Retrieved on 18/01/2014, from http//www.unep.org

Wikipedia, (2011). Waste Management. Retrieved on 1/02/2014 from http://www.wikipedia.com/wastemanagement.

World Weather and Climate Information (2013). Retrieved on 14/06/2014 from http://www.google.com

World Wide Index (2018). Geographical coordinate Information. Retrieved on 17/08/2018 from http://www.google.com

APPENDICES

Appendix I

QUESTIONNAIRE

SECTION A: SOCIO-DEMOGRAPHIC DATA ON RESPONDENTS

1 Age of Respondent
   1. Below 36 Years
   2. Above 37 Years
2 Gender of Respondent
   1. Male
   2. Female
3 Educational Level of Respondent:
   1. Primary/Islamic/Secondary School
   2. OND/NCE
   3. HND/Degree and Above
4 Occupation of Respondent
   1. Civil Service
   2. Trading
   3. Farming/Herding
   4. Artisan/Craftsman
5 Location of Respondent in Koko
   1. Newly developed Area
   2. Old town
6 Respondent's Origin for Koko
   1. I was born in Koko
   2. I Migrated to Koko

SECTION B: SOLID WASTE GENERATION BY RESIDENTS

7 What is the type of waste you generate much?
   1. Food Waste/Polythene Bags/Empty Food Packages
   2. Plastic and Metallic Containers
   3. Leaf falls and weeds cover within the house/Animal Feeds Remain and Dung
8 In which type of receptacle you store solid waste in your home?
   1. 1. Sack
   2. 2. Basket
   3. 3. Metal/Plastic Container
   4. 4. on the Floor.
9 How long you keep the Waste you generate before Disposal?
   1. 1-3 days
   2. 4-7 days
   3. More than a Week
10 Where do you disposed-off your solid waste?
   1. Household Dumpsite
   2. Community/Public Dumpsite
   3. In Water-Ways
11 How many Dumping Sites Are in Your Area?

1. Less than 6 Dumping Sites
2. More than 6 Dumping Sites

12 What is the Distance between Your Residence to your Dumping Site?
1. More than 200 Meters
2. Less than 200 Meters

13 Please Rate Hygienic State of your Dumping Site?
1. Hygienic
2. Not Hygienic

SECTION C: DATA ON SOLID WASTE MANAGEMENT PRACTICES IN KOKO

14 Who evacuate Waste from your dumpsite?
1. My Household
2. Community
3. Government

15 In what Time Interval Waste is Evacuated from your Dumping Site?
1. Monthly
2. Occasionally/Infrequently

16 What Type of Waste Treatment is practiced at your Dumping site before evacuation?
1. Composting
2. Incineration

17 Do people come to collect compost/manure from where you dump waste and take it to their farms?
1. Compost is collected
2. Compost not Collected

18 Do you segregate waste you generate before disposal?
1. I do not Segregate Waste
2. I segregate Waste

19 Do you practice Waste Reduction at Source of Generation?
1. I practice Waste reduction
2. Not practicing Waste reduction

20 Is it necessary for waste to be segregated before disposal?
1. Useful Items Sold to scavengers after Segregation
2. Useful Items neither be Segregated and not Sold

SECTION D: RATING KBLGA ON ITS ROLE IN MANAGING SOLID WASTE

21 Do you think that the local government has the capability (man power and money) to manage solid waste in Koko town?
1. KBLGA is Capable of Managing Solid Waste in Koko
2. KB LGA is not Capable to Manage Solid Waste in the Town

22 Do you think that Involving Koko Residents by KBLGA can lead to Efficiency in Solid Waste Management in the Township?
1. Involving Koko Residents can lead to Efficiency in Solid Waste Management
2. Involving Koko Residents would not lead to any Efficiency in Solid Waste Management

23 Have you ever experienced any Disease causes by Solid Waste Mismanagement?
1. Yes
2. No

24 Do KLGA involved Residents in Managing the Waste they generate?
   1. Yes
   2. Not Involved Residents

25 Do KBLGA Sensitize you on Solid Waste Management Practices?
   1. Yes
   2. No

26 Are you Satisfied with KLGA's Effort in managing Waste in Koko?
   1. I am Satisfactory
   2. Not Satisfactory

27 Are you ready to actively Participate and keep on participating in managing solid waste you generate?
   1. I am ready to actively Participate
   2. Not ready to actively Participate

28 Do you prepare Waste for Easy Collection and Safe Disposal?
   1. I prepare Waste
   2. I do not prepare the In generate Waste

Appendix II

FOCUS GROUP DISCUSSION GUIDING QUESTIONS

1. What are the roles that people in Koko play to manage the waste they have generated on daily basis?
2. How people handle the waste they generate before disposing it to the dumping sites?
3. How convenient are the dumping sites in Koko in terms of their locations and distance from houses?
4. How the dumping sites in Koko town are evacuated?
5. How is the KBLGA carrying out solid waste management in Koko?
6. Are Koko people willing and ready to collaborate with KBLGA in managing solid waste generated in Koko?