

**DOMESTIC WASTE DISPOSAL IN BOSSO LOCAL
GOVERNMENT AREA NIGER STATE**

BY

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AWARD OF POST GRADUATE DIPLOMA IN
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ATTESTATION

I Bala Adamu Laka Bosso do hereby attest that beside the references made in this work for which I have duly acknowledged, the ideas, contained have in are purely mine and are based on my field work practicum. I also attest that the work has not been copied from any research project here in the University or else where further more, this work has not been presented else where for the award of certificate.

APPROVAL PAGE

This project has been read and approved as meeting the management for award of an Post Graduate Diploma in Environmental Management of Department of Geography School of Science and Science Education (SSSE) Federal University of Technology Minna, Niger State - Nigeria.

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EXTERNAL EXAMINER

DATE

DEDICATION

This project is dedicated to my parents that made my life of what I am today and my wives, children, brothers, sisters, friends and Co-staff Bosso Local Government. Also my Director Primary Health care Bosso Local Government Maikunkele for their Love and encouragement in all my undertakings

Bala Adamu Laka Bosso.

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My thanks go to Adamu Laka and Danagana Alheri Kpetu who made my life meaningful to what I am today. Thank to my wives and children by supporting me and Adjusting their condition of living within the period of my studies, my gratitude also go to my friends honourable Ahmed Garba Bosso for his morally support. Lastly thanks be to "Allah" the creator of mankind.

Bala Adamu Laka Bosso.

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CHAPTER ONE

1.1 INTRODUCTION: - GENERAL OVERVIEW

Every being has its closed associate as the immediate environment is the aggregate of external condition and influences actively the life and development of an organization both the physical and biological forces of nature surrounding an individual. It is on this environment that all basic needs of man's vary existences are found. But the environment is being influence by intricate wed of factors. The most prominent being increase in human population.

In Nigeria the population has been on increase and of an alarming rate. The growth rate is about 3% with projected population of about 115,5224,312 for the year 2000.

TABLE 1.1 PROJECTED NATIONAL POPULATIONS. 1990 - 2040.

YEAR	PROJECTED POPULATION	CRUDE DENSITY PER KM ²
1990	85,993,483	92
1995	99,207,942	103
2000	115,224,312	124
2005	133,766,926	144
2010	154,801,325	166
2015	178,575,651	192
2020	205,437,137	221
2025	235,556,077	253
2030	263,813,190	269
2035	304,610,540	328
2040	341,986.340	368

DATA SOURCE: NPC, NIGERIA AT A GLANCE '91

The population increase led to growth of urban population and urbanization, combined with other factor such per capital consumption of resources and increasing level of technology is causing severe pressure on eco-systems (Kunle et al 1996). Due to pressure eco-system and the attendant problems, United Nations environment programme (UNEP) have been playing important roles in developing knowledge of environment problems and how to solve them. Among such problems is waste disposal system.

Waste is defined as any gaseous, liquid or solid material that is thrown away because it has no further use by the owner (may 2974). Man in his everyday activities of his life produce waste matter in large quantity and different form. If waste are generated from man existence, one will conclude that waste had been problems since man existence on the earth. But it was not known to him as problems until when population of people was increasing. When people understood the value next question now was waste disposal. Though waste constitute industrial and domestic waste for the purpose of these product are based on domestic waste disposal within Bosso Local Government Area of Niger State.

Bosso local government has about 20%-30% of it total population living within urban center like Bosso Town, Maikunkele, Chanchaga and Maitumbi respectively while others live within semi urban area like Beji, Garatu and Kodo. All these settlement produce waste, which are mostly domestic waste with little industrial waste.

The waste are mostly sewage and refuse (liquid and solid waste) though little of the waste from chemical and gaseous forms from vehicles and drying premises. waste constitute about 70 to 80% of our problems in the developing countries and need special attention for solution. In our various houses waste are disposed on the street, bush, streams, vacant plots, excavated lands e.t.c either solid or liquid (sewage or refuse) with out considering the environmental pollution and environmental degradation.

Waste generally cause endemic disease in our environment. Disease like Typhoid, malaria, diarrhea, dysentery, guinea worm, tetanus snake bit and even fire outbreaks from dry refuse and many other disease. The persistence of huge domestic waste of our urban and rural area constitute most of our administrative problems in Nigeria and most of the developing countries. Those waste are generally of organic and inorganic which are biodegradable and non "planning the Nigeria cities for better quality of life started that beauty is one of the characteristic of a livable city. He concluded that this are lacking in Nigeria with few exception like Abuja and some micro entities like universities campuses and research station. The aesthetic quality of the most settlement are on the low side.

There is generally lack of green, these is a preponderance of waste----- (Egunjobi 1997).

It was reported that the proportion of Nigeria's urban population increased from 20 percent in 1993. the urban population estimated at 40 million grown at the rate of 5.5 percent annually due to high rate of rural urban migration (the world Bank

1995). All these increase in population constitute a lot of waste disposal problem more especially domestic waste disposal.

The rise in human population and acceleration urbanization in Nigeria and political development in terms of creation of new state and local government areas there is corresponding pressure on urban center and degradation of environmental quality and the larger the urban area the lower the quality (Kunle et al 1996) as quantity and concentration of waste generated rises with urbanization and human population. The most prominent and well known of the waste is solid waste. The solid waste comes in different form, different quantity and ways. The waste constitutes mostly are food (remnant), rubbish which will not decay this also includes plastics, paper rages cellophanes bags, bottles and tin can. The waste also include construction and demolition, waste like wood, bricks and stones from building. Also we have old furniture, ashes and the like.

As domestic waste are as a result of man's activities in life, the removal and disposal had become necessary to individual institution government organization, and environmentalist. Infact print and electronic media should also make it as concern of their daily report, it is earlier stated that waste generation and disposal became acute with the increase of population everyday, waste are seen littering (Ojeshire 1999) stated that waste disposal had become one of the greatest phenomenon of Nigeria cities today. Over most of the urban and rural center, mounds of waste remain uncollected for days, sometime weeks and eventually became dumpsite, posing serious, if each year waste accumulates are not collected for two years a community would be buried by there own

waste product.

To this end, (Odeshire 1999) lamented that dumpsites, we kept in Nigeria are the cause to endemic cases in the country Nigeria e.g. typhoid fever, cholera, malaria and others. Waste problems in our urban and rural center and in ability of local government area whose waste disposal falls under its jurisdiction, the federal government of Nigeria declared 1976 as the environmental sanitation year. October 1st 1984 federal government launched its fifth phase of war against indiscipline which introduced weekly sanitation days in his speech, the then chief of staff supreme Headquarters general Tunde Idiagbon observed that dirty environment contribute significantly to high mortality rate more especially among children. In the same vein in 1988 considering the degree of federal government problems in the country, the federal government inaugurated federal environmental protection Agency (FEPA) and subsequent launching policy on environment in 1989 and publication of guidelines and standard for Environment pollution control in Nigeria in 1991, a ministry of environment was greater and sanitation diary was that cleanliness supposed to be a habit on basis not to be required.

1.2 BRIEF ON DOMESTIC WASTE DISPOSAL IN THE STUDY AREA.

Bosso Local Government was created from Minna Local Government in the year 1991. Before the creation, of the local government waste collection and disposal was done in Bosso Town, Maitumbi, Chanchaga, Maikunkele by the local government and state government that is following the launching of war against indiscipline, phase five in 1984, waste collection, management and disposal was given a priority under the

then military governor col. David Mark, a task force was inaugurated and jointly financed by state and local government the then Chanchaga Local Government. Vehicles for evacuating and solid waste was provided. Federal ministry of work and housing also have quality emptier for sewage collection and disposal only. The quality emptier before collecting sewage from houses. They disposed this waste anyhow without considered the effect of such disposal. The disposed waste openly into bush and stream leading to contamination. The local government then have about 30 Health superintendent and about 60 health attendant (lab rowers). During David Mark's regime (1984-1986) waste disposal was good and efficient.

With the exit of David Mark in 1986 the organization's work towards sanitary and waste management began to face problem first among such problem was the funding. Between 1986-1990 the sanitary department and task force was given less than #50,000 monthly as subvention. By 1990 state government gave only about #20,000 monthly while local government could not fulfill it's obligation of the counterpart funding. This affected the organization's work and lead to the garbage accumulation and dumpsites.

In 1991 the local government was divided into three Minna, Bosso and Paikoro. The study area still fails under state capital that is Bosso town, Maitumbi, Chanchaga and Maikunkele respectively. There was creation of state environmental protection agency (NISEPA) this board took the responsibility of waste management. With these agency thing began to retain again.

1999 urban development board was created in the state to manage the issues of

waste within urban center in which study area happens to be among the area cover by Niger state urban development board of (NUDB).

Between 1991-1999 about nine (9) waste collection and disposal vehicles were purchased. By 1999, the sanitary vehicles were raised to ten (10) unfortunately only five are road worthy forcing NUDB to chartered tippers from individual to execute their programmes.

For sewage disposal the Board had raised two gully - emptier collect liquid waste from house on chargeable amount by the staff. Federal university equally has one refuse van and caterpillar for emptying, collection and disposal of liquid & solid waste from the working with the university. Though at request they also charge and collect liquid waste within the urban center of Bosso local government.

Liquid waste from houses are channel out if various houses to the street and some to stream leading to pollution of the environment. Were the waste water are channel to the streets make it difficult for vehicles and people movement. Because those streets are littered with waste, waste that causes offensive odors to the closed environment.

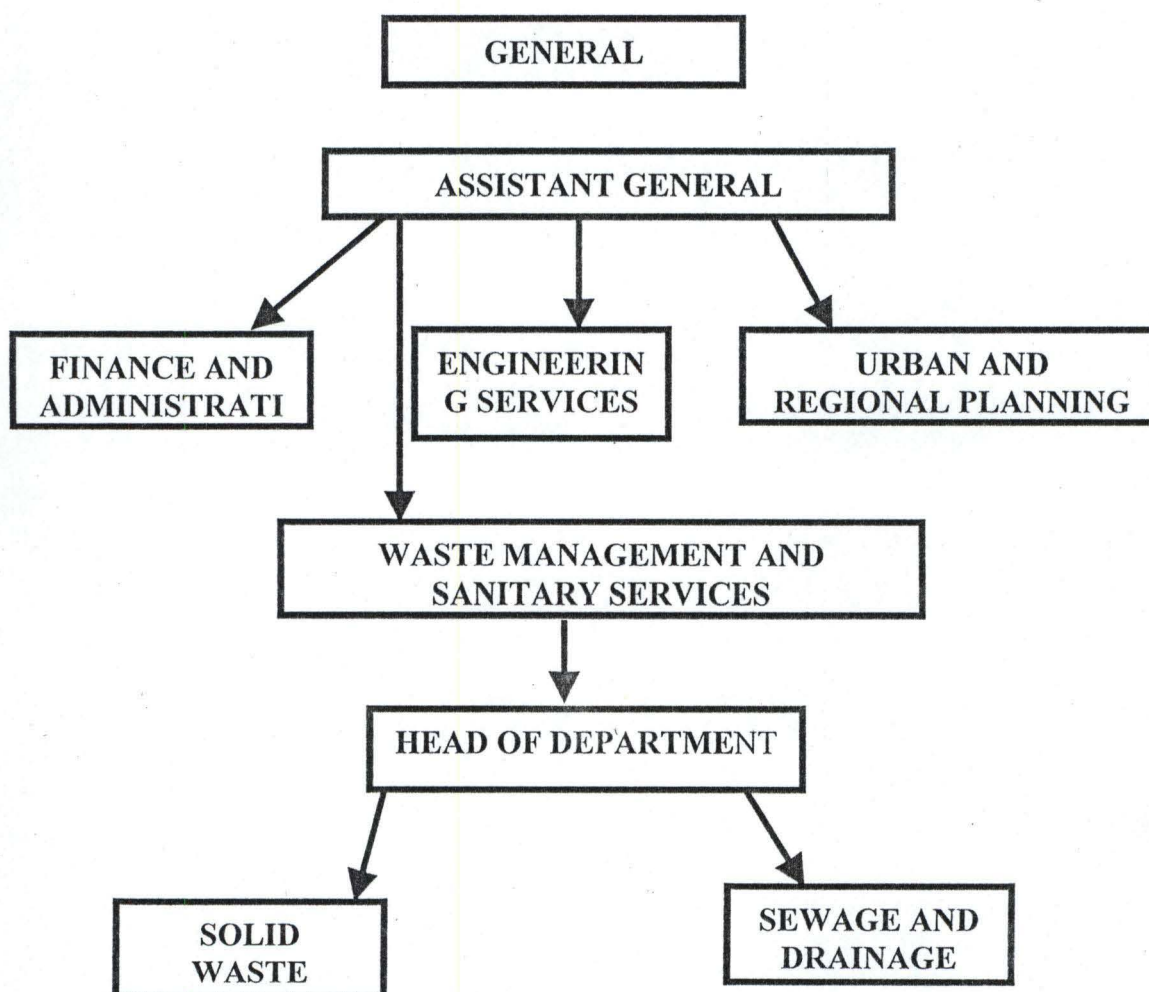
About 20% of the population uses water system of temporary liquid waste disposal while the remain population uses either ventilated pit latrine, pit latrine and some house don't even have any type . They go on open disposal of their liquid waste like excreta and urine leading to environmental pollution.

About 60-70% of houses empty their toilets through digging pit near the toilet and evacuate the filled up pit into the pit. There are people that made that as business.

When your toilet is filled up you cannot afford to call NUDB for evacuation, you call those types of people to emptier it.

The Board has about 215 labourers and also made use of sanitary officer in monitoring the state domestic waste collection and disposal within the state capital in which the study area is part. The state since the creation of the board has been funding it.

ADMINISTRATIVE CHART OF N.U.D.B MINNA



SOURCE: NIGER STATE URBAN DEVELOPMENT BOARD MINNA.

The board also sets turn to house owners in Bosso low-cost and others. This service as dustbin for easy collection of solid waste in such area. Refuse van only follows those areas to collect refuse at least once or twice a week.

1.3 STATEMENT OF THE PROBLEM

The increase in urban population like Bosso town, Maitumbi, Chanchaga and Maikunkele with the corresponding increase in waste generation at alarming rate became a matter of concern to the people living within the local government. The rate which waste are collected and disposed is far below the rate, which is generated within urban and rural center of the local government. Despite 80% of the total cost of dealing with waste goes to collection (WHO 1971) The inability to adequately collect and disposed the waste affect the sanitary standard of the causing environmental problem such as pollution of the atmosphere, contamination of ground water and removal of aesthetic and economic value of the land, on the inhabitant of the local government waste become a breeding ground for flies, animals and reptiles that cause threat to health. Looking at the problems which became a serious subject of study.

1.4 SCOPE OF STUDY

The study is mainly concerned with waste disposal in urban center of Bosso Local Government Area of Niger state that is the domestic waste disposal within Bosso town, Maitumbi, Chanchaga and Maikunkele. Interview questionnaire were asked by sampling population cutting randomly as it is not possible to reach out to every house and every body. The research is also concern with the waste disposal system within the area mention observed. Also the variable of family size, source of waste, composition

and disposal attitude and habits on waste disposal system inadequacy of disposal facilities as they affect waste management.

1.5 AIMS AND OBJECTIVES OF THE STUDY

Waste disposal generate a lot of serious environmental hazard within our community and threat to our health, it had become necessary to be study.

Below are my aims and objectives of study.

1. To find out various sources of domestic waste
2. To study the mode of domestic waste how they are handled and disposed off in the study area
3. To identify the agency responsible for domestic waste disposal
4. To also study the method of waste disposal in the study area
5. To analyze the problems encountered by the agency responsible for collection and possible solution to these problems.

JUSTIFICATION OF STUDY

Waste is as a result of man's activities since the beginning of his life the generation of solid and liquid waste materials date back to increasing rate of waste generation and it associated problems. In curbing the finance of waste, environmental sanitation came to be accepted as a nation wide programme. Public enlightenment through advert was used by the various public agencies and Non-governmental organization (NGOS) to check proliferation of waste materials in our society. the study is aimed at bringing out and directing people alternation towards good and adequate use of the available waste disposal facilities like hand fills, communal depots and other efficient strategies of waste disposal and management.

CHAPTER TWO

STUDY AREA

2.1 DESCRIPTION OF THE STUDY AREA

Bosso Local Government is within the state capital of Niger State. It is located southeast part of the state. The head quarter of Bosso Local Government is about 10 kilometer from the capital (Minna). It was created in the year September 1991 during General Ibrahim Badamasi Babangida regime. it is one of the 25 local government surrounded Minna Local Government.

Bosso Local Government enclosed Minna Local Government both in North, South, West and longitude $60^{\circ} - 38E$ on basement complete situation at the base of prominent hills in an undulation plains.

Few stream in the government are been constructed by Julius Beggar during General Ibrahim Badamasi Babangida regime. The main gutter by most of the main road are been constructed by government. Though most of the drainages within the township of the study area are locally constructed by individual that drained waste, water from houses to other quarters and stream within the study local government. Most of the quarters are managed by individuals, which retain waste water for breeding of vectors like mosquitoes and others.

2.2 POPULATION OF STUDY AREA

The creation of Bosso Local Government lead to rapid population growth of urban centers that people generate alot of waste. These waste are getting out of hand

because, the way in which waste are generated are not been collected to meet up the generation. That is the way waste are collected are below the generation rate.

According to National Population Commission during 1991 census give the population of the local as 92,263 and below are the projection in the population.

YEAR	PROJECT POPULATION
1992	119,942.8
1993	155,924
1994	202,701
1995	263,512
1996	342,566
1997	445,336
1998	578,937
1999	752,618
2000	978402
2001	1271923

The formula to finds the population projection:-

Existing population multiply by 1.3% = projected population.

2.4 CLIMATES AND VEGETATION OF STUDY AREA

The climate and vegetation of Bosso Local Government are transitional between the humid forest area in the south and the continental grassy plains of the north (Hoesel 1981) Adetofalu disenabled the climate as moist dry equatorial tropical, raining season start from April to October with the month of September recording the highest rain of 3000 mm, dry season ran from November to April generally Bosso average temperature is not less than 300 celins.

CHAPTER THREE

LITERATURE REVIEW

3.0 INTRODUCTION

Waste generally are any material that are thrown away because it has no further use by the owner. Waste are of solid (Refuse) and liquid (Sewage) and constitute general problems to our environment. The generation of waste are virtually everywhere on the earth if human existence are present. The major sources of air, water disposal every day by consumer in the society. These waster are mostly domestic waste from our houses and these waste constituted physical problems to our population that need special attention for safe disposal. The new book of popular science 1980 stated that united state are the world largest consumers nation has the most serious waste problem. House refuse, commercial rubbish, industrial waste total more than 700,000 metric tones of waste produced daily.

Z.A. Ademuwagu 1975 said that household thrown many things they no longer need. Every, people put food waste and a lot of paper into can or bags the collection for proper dumping constitute serious problem that lead to environmental degradation, problem to breeding center of flies and others vector that are dangerous to human health.

3.1 THEORIES OF WASTE

Waste according to Berry et al (1974) are the unwanted undesirable materials that originate from residential, industrials mining project, commercial and municipal

uses of urban area. He also defined waste as any gaseous away because it has no further use by the owner of the waste types solid waste is most problematic as it can be found in our cities uttering the streets, obstructing roads and drainage network, polluting the environment and constituting a public leave hazard as between one-third and one-half of the city trash goes uncollected.

Waste disposal and management object according to Okpala (1986) is to collect, transport, treat and finally dispose off that waste in a hygienic and authentically acceptable manner at lowest possible costs. Similarly, Ademicuyi et al (1967) saw waste disposal and minimization, reduction identification, separation, segregation, collection storage, transportation disposal, treatment, sale and recycling of waste. If involves maintaining records of quantities, composition destination end proof of disposal. Regular monitoring and audit of waste disposal and managed, saves (1977) opined that waste management center around how to remove the wanted how to assure compliance on past of individual citizen and who should perform these cities and how to pay for them.

Due to the reasons of waste disposal and management the idea of sanitation came into being. Environmental sanitation is the control of all those factors in man's physical environment which exercise or may exercise a deleterious effect on physical, mental and social well being (W.H.O) similarly, the world Book of encyclopedia defined it as the science of controlling man's surrounding to promote health and comfort, or the process of training environment so that it no longer constitute hazard to man.

To have effective disposal management of waste and keeping good sanitary

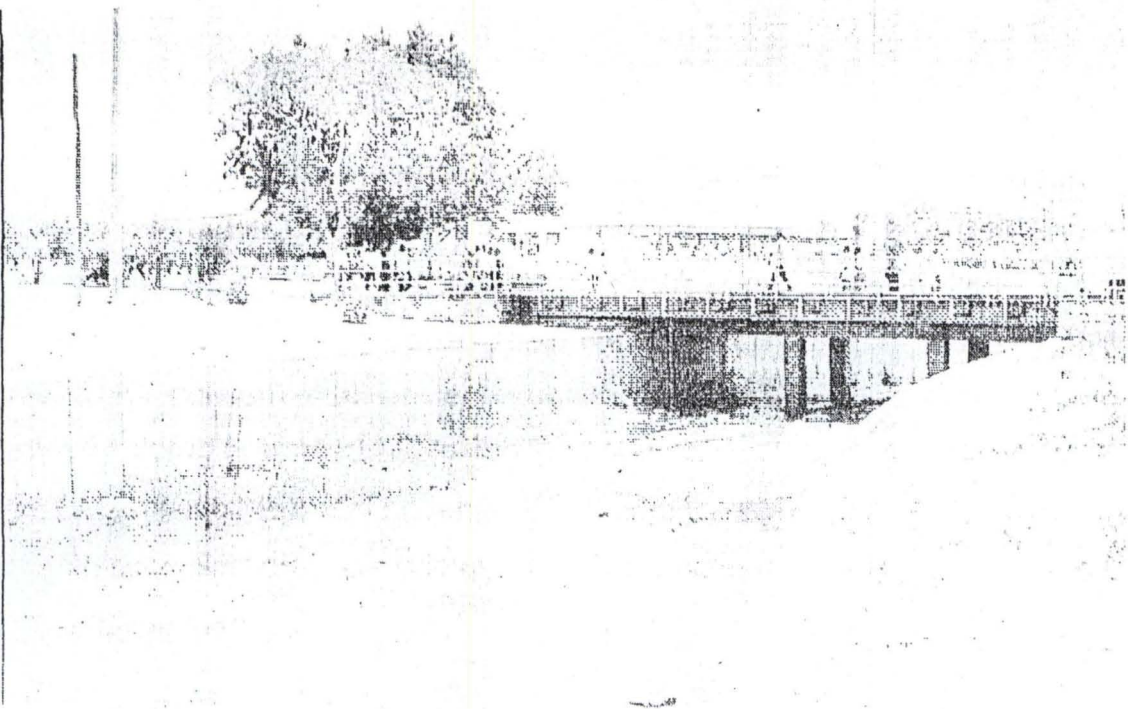
environment, various successive government have been formulation of effective disposal. Among such effort was the launching of fifth phase of was against indiscipline in 1984 that introduce weekly environmental acknowledge the effect of waste and commended that a dirty environment contribution significantly to high mortality establishment of government agencies to deals with waste. For example Lagos establish waste disposal Board for work management in 1980, also there was establishment of federal protection agencies (FEPA) 1988 and Niger state task force on environmental sanitation 1988. The state also established Niger state urban development bound 1998. With the effort by government of where management waste still take about 80% of our problems within the urban and rural centers.

3.2 THEORIES OF WASTE SOURCE.

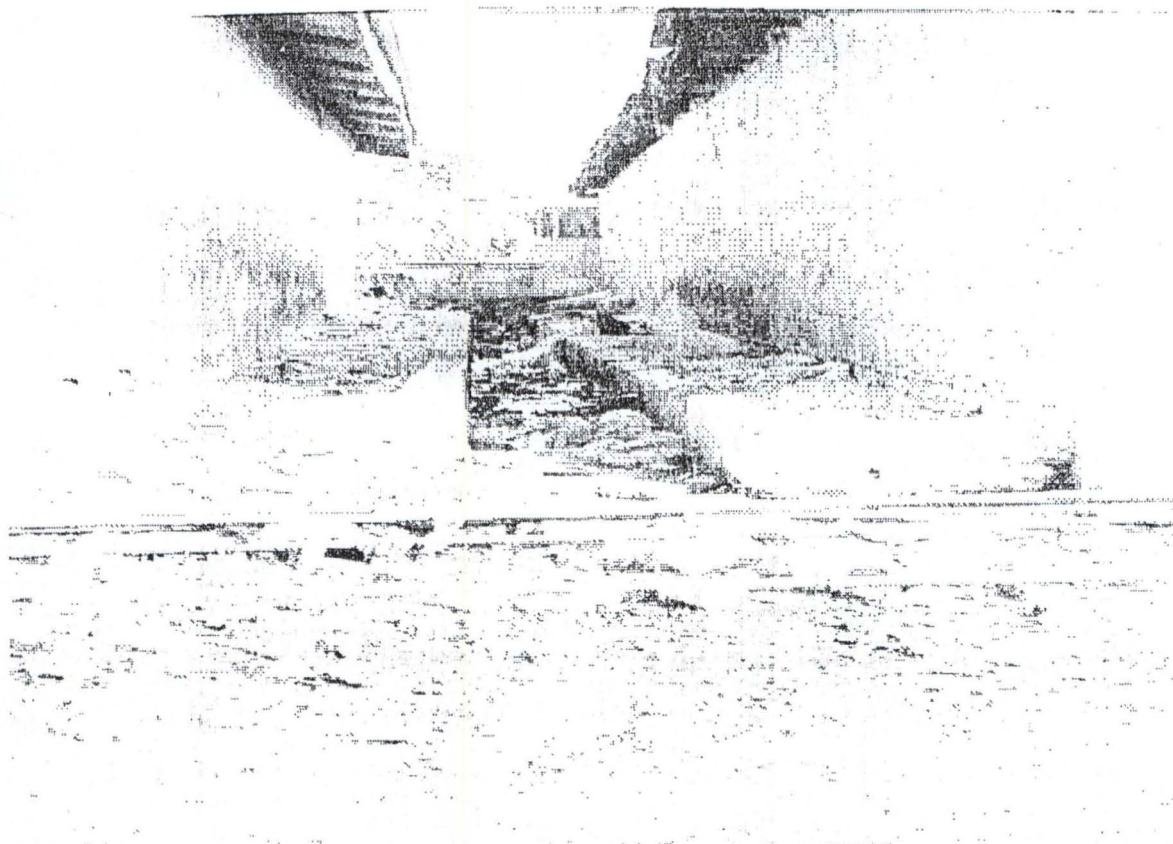
Waste has been defined as any liquid, solid or gaseous which has become absolute hence it discardment by the owner or user. It has been estimated that in urban areas in Nigeria, about 11 kilogram of solid waste is generate per capital (Jehu 199) the waste material may be inform of garbage this constitute chiefly of waste food which decay or not, rubbish which will not decay and includes plastic, paper, rags, bottles and tins cans. There are also construction and destruction waste, which include woods, bricks and stone from buildings. Others include old furniture, abandoned automobiles, ashes, and the likes. Also there are the unkempt or unattended grass foliage that may harbour rodent and dangerous reptiles (Ango 1998). similarly Isah (1999) is of the view that waste originated either as a result of house hold activities of man which include garbage cellophanes bags e.t.c and savage which include excreta , urine, washing waste

water, e.t.c. are all termed to be domestic waste.

Also Anderson (1973) stated that the general sources of communities waste includes about (80%) of household waste, commercial, recreational and industrial waste from about 20% respectively. These occurs as garbage, refuse, street clearing human discharge, kitchen waste sewage waste commercial, manufacturing and processing plant waste.



Photograph of a stream constructed by Julius Berger that passes through the Federal University of Technology minna during the President Ibrahim Babangida regime.



Photograph showing Liquid waste disposal system constructed by Individuals in Chanchaga town of Bosso Local Govt. Area.

3.3 THEORIES OF WASTE DISPOSAL.

Waste disposal is the removal of solid and liquid waste from where it was generated to place that will not be hazardous to human health and environmental degradation. Disposition of waste can be said to have been made when it is collected, transport, treated and dispose off menace. The necessity for concern that waste collection and disposal from concern that improperly stored or treated waste can feed and harbour diseases- bearing pest (rats, flies, mosquitoes) and endanger public health.

Waste collection is the primary purpose of solid and liquid waste removal and disposal especially garbage to minimize the possibility of diseases and to reduce the effect of littering, environmental pollution and degradation. But the attitude of the inhabitants to keeping good environment may contribute to the piling of waste. Hence, Molly O' Meara. (1999) observed that remains from some of earliest cities suggest that resident of at first took a devil- may - care approach to waste disposal, simply raising the roof of their houses as mounting garbage lifted street levels. Similarly, Anderson (1973) stated that the sheer volume in a year can develop to mountain stock pile. He added that each year waste accumulated in a period of two years (2) a community would be buried by its own waste product. To sum up. Nsan said that if the present poor attitudes to environment; sanitation remain unchange Nigeria would need about #1.36 billion between 1984 and year 2000 to clear the mountain of waste which would have built up in the country.

From the above views, it shows the importance of adequate waste collection and disposal. Though most of our cities are far from being free of waste Inselberg (Dehu

1999) concerted effort is being made by all concern. To this end different methods of waste is being employed.

Most settlement have been sited to take advantage of waste for human activities. There rivers and stream that provide during water are used to carry away waste most especially house hold waste, so flow of waste into a city and flow of waste out are intimately linked (Molly O' Meara 1999). This method through still in use has advers on pollution of water and killing of aquatic lives.

Another traditional method of household waste disposal is by feeding animals with waste they are composed food and after separation from those that cannot be consumed. Nduka (1985) said, yam peels are fed of goats and left over cooked foods fed to pig.

Open dumping of waste is increasingly having criticized because of it effects on environment and socio-economic problem inbuilt into it. Such problems is continuing decrease availability for such use as population is in increase. But Okpala (1986) observed that greatest problem is not with the disposal but collection, hence the house to house collection system involve waste truck moving from house to house hold refuse cans and carry it to a central point or direct to disposal site. He observed that it is the most effective but expensive as about 80% of waste management goes to collection and disposal.

The house to house collection method is already in use in many of our cities most especially Lagos, Ibadan, Enugu, Kaduna and Abuja. It was also introduce in Minna as pilot scheme in the second half of 1980s failed. For the communal depot, the inability of

government agencies to evacuate the waste regularly led to the building of soil waste Inselberg which offend both the senses of hearing and seeing apart from the economic effect it has on the site.

The burning of refuse waste is another method of waste disposal system. In most of the urban center fire to offer set on mountain of waste reduce the size, quantity of it. It is said that burning reduces the amount of waste to between 10-15%. But open burning of dumping site causes air pollution, which may result into respiratory diseases. To check indiscriminate burning of refuse incineration is best for used. Incineration is the controlled of solid, liquid or gaseous waste (USEPA1978).

Another method is sanitary land fill. Frank et al. (1978) Nduka (1985) Okpala (1986) and Williams (1991) all agreed with the use of sanitary land fill as safe method of waste disposal if handled properly. According to Okpala (1986) solid waste are phase in a trench or spread in this layers over a prepared area of land, computed and covered each day with a required amount of each cover materials.

These methods has problems, such problems are increasing shortage land in urban centers and under ground water contamination through leached. To avoid leach ate FEPA(1991) state that a surface impediment shall have a layer that is designed, constructed and installed to prevent any migration of waste out of the impoundment to the adjacent sub surface soil ground water or surface at any time during the active life (include the closure period) of the impudent. IT is important to note that reusable materials are serious lost.

Owen (19750 and Williams (1991) saw in ocean another place of waste disposal.

It's effect may be felt as ocean water are said fit only for transportation system.

Another method of waste disposal is combusting. In most Nigeria urban center heaps of waste most especially those containing food remains (e.g. fruits) or when in contact with water may decompose to become manure Molly (1999) observed that organic waste such as paper, food scraps on clipping and even human waste are valuable resources.

In industrial countries, food and yard waste alone account for 36 percent of the municipal waste stream. The inherent problem with this method of disposal is the lost of researchable materials and source of income to others.

Of recent recycle is used as a means of keeping waste off our environment. Recycling is the processing of waste in such a way as to recover some useful (raw materials from it for leading the part of nation is recycling useable materials. In this process the role of scavengers is recognized. scavenging, involves the selecting picking of reusable recyclable or soluble materials from waste (Kunle et al 1986). In Cairo Zabbalean (people who picked recyclable waste) did it so thoroughly that only about 15 percent materials from city trash. The scavengers make money more people employed from their work and the city reduces the lost of waste disposal and management.

3.4 THEORIES ON PROBLEM OF WASTE DISPOSAL AND MANAGEMENT.

The recurring issues of waste management, are how to remove the waste, how are compliance on the part of all citizens, who should perform these duties and how to pay for the (Savas 1977). Waste collection, transportation and disposal in Nigeria are generally in effective or non-existent. it is poorly administered with little clear

definition of functional co-ordination and financial accountability (USEPA 1979).

The above views highlighted some of the problem of waste disposal and management in this part of the world. These problems to be carefully study, analyzed with the ultimate goal of finding solution to them.

The people's altitude of dumping refuse indiscrimately are major problem of waste management. Adults and children charged with emptying of house hold waste containers also some meters away from their houses, some in nearby drainage. Yet others near the community depots on in sanitary habits and attitudes Equantobi (1985) stated that, we must not underestimate the role of habits and attitudes of the people in keeping a sanitary environment. This brought to mind environmental sanitation task Force constituted by Federal Military Government in 1984 after launching of war Against indiscipline (WAIC) Fifth phase. These essence is to include a sanitary habit in every Nigeria.

Ogisi 1984 caution that the regulation may not achieve much success if the people fail to appreciate the need for a clean environment.

Inadequacy of waste disposal facilities in cities compounded the problem. The facilities provided either communal depots or incinerators are over stretched by the growing number of people. (Kunle et al 1986) stated that rapid growth of urban population means that many cities have flowed. Their boundaries, it is difficult for the city Authorities to plan priperly for urban service provision and urban development.

Waste disposal management is generally in Nigeria characterized by inconsistency in organization and administrative structures. Constitutionally waste

disposal and management is a responsibility of municipal or local government areas, but in all states of the federations, boards, agencies and authorities have been created for the same purpose. For example, in the area of study Bosso the local council has it workers responsible for sanitary activities their came the various task force on environmental by the then successive military government before the establishment of Niger state environment protection agencies (NISEPA) and now urban Development Board (NUDB). Their function overlapped and often staff from one agency move to another. This collaborated mid-1995 report of waste that "there is no proper management organization deal with the problem of waste and there is no agency specially and wholly vested with the functions of waste disposal and management (Jehu 1990). In a similar report USEPA (1979) with specific reference to Lagos metropolitan Area observed that the present inefficient system will be further compounded by the fragmentation of responsibility for waste collection and disposal for the metropolitan area among several local bodies.

As earlier stated that about 80% of total cost of dealing with refuse goes to collection, Okpala (1986) observed that above the greatest constraint on the way of effective and quality waste management is the inadequate financing of the process. On funding, Lagos state, on their environment report 1995 admitted the inability of government to fund the programme adequately due to scarce resources, hence the 10 years programme (1991-2000) on Environmental management that has been estimated to cost 60 million naira per annum. In 1995 about the made budgetary allocation of only 34 million naira to cover capital, special and recurrent expenditure which is inadequate

as compound to the programme.

From the above assertion, it shows that non-governmental agencies (NGO) and environment friendly individual should come into the programme.

Despite the proliferation of urban environmental management/ waste management agencies in our cities, they lack technical manpower and machines are inadequate and almost broken down. infact most of the machines are imported. Kunle et al (1986) comment, the introduction of high technology for waste management by the public sector in itself is questionable, considering the poor maintenance culture, cost of maintenance and spare part replacement, in the face of more appropriate ones like barrows, hand carts, small tippers and animals. To sum up the problem Jehu (1999) said that existing government agencies responsible for waste surfer from a group of related problems such as lack of technical manpower, fund and equipment.

3.5 COMPOSITION OF DOMESTIC WASTE

Domestic waste of Bosso Local Government are made up of liquid, solid waste. The liquid form (Sewage) are made up of bathing water, washing water that comprises of water and chemicals like detergent e.g. parazone, detol, die Izol all use for washing and bathing. While solid waste take the largest form of refuse waste comprises of food, ashes. Furniture that are old, wood, broken houses, blocks that are not still good for use, old mattresses, cloths e.t.c.

Human excreta also form part of liquid waste (sewage) within Bosso Local Government.

There are also grasses that form domestic waste but very little. That is cooking that take place within houses are part of it.

3.6 MATERIAL USED FOR DOMESTIC WASTE COLLECTION

For effective collection of waste from houses to temporary dump, different materials are use base on understanding and financial position of individual house hold. From individual compared to temporary dump. The following are materials used. Basket, condemn pans, cartoon, cellophanes bags, plastic rubber, wheel barrow, drums waste from the temporary dumps to final dump are collected by government or individual in the following articles:- Tippers, refuse vans, Rono bins that is for solid waste collection and disposal while gully - emptier, cellophanes bag sold two naira and five naira are used in collecting human excreta and dump any how to different environment that is the waste are dump indiscrimately without considering the hazards attached to it.



Photograph of indiscriminant disposal of Solid waste at Jikpa – Bosso almost blocking the Street.



Photograph of Drum used for incineration of Solid waste.

3.7 DOMESTIC WASTE DISPOSAL CENTERS

There are different domestic waste disposal centers in Bosso Local Government based on an individual faculty of understanding what waste generally cause to the environment and individual health. Some people are innocent of the dangers but majority do it deliberately. They collect the waste from their own environment to a different environment from where they live. Some are not far from their own premises. This in turn constitute problems to environment. Few of the centers are open space, plot, farmland, streams, street backyards and others. There are also collection center approved by government or individual for dumping of waste some excavated land are used for dumping of refuse example of such area are Kuta road after Maitumbi and Nnamdi Azikiwe Street formally Southern by-pass near school of the Handicapped Minna and many others.

CHAPTER FOUR

4.0 RESEARCH METHODOLOGY

The study was carried out to find out the domestic waste disposal system within the selected area of Bosso Local Government of Niger State. And even within the local government the researcher selected five (5) wards namely Chanchaga, Maitumbi, Bosso Central I and II, Maikunkele the headquarters of the local government.

4.1 RESEARCH METHOD

To obtain information which allowed for indept study of the state of domestic disposal and management the researcher employed descriptive survey method by framing interviewer question are observational method. This method allowed for information to be source concerning the current status, phenomena, or happening. Descriptive method is used because it describes, interprets and is concerned with condition or relationships that exist, opinions that are held, evidence of effects, current and developing trends.

4.2 SAMPLES AND SAMPLE TECHNIQUE

As all inhabitant of Bosso Local Government cannot be reached, the researcher selected randomly a total number of 100 respondents to administer interviewer questionnaire been frame by the researcher on domestic waste disposal system within the local government. The respondents were then either the head of the household or his spouse, and where neither of them were not available an adult who may be familiar or has sufficient knowledge about the research topic was interviewed. Also within

ten(10) political ward in Bosso Local Government, five (5) were randomly selected from which the respondent randomly selected lived each of the five words randomly selected a total of 20 people were interviewed.

TABLE 3.1 THE POLITICAL WARDS IN BOSSO LOCAL GOVERNMENT

S/NO	WARDS	WARDS TAKEN
1	Bosso Central I	Bosso Central I
2	Bosso Central II	Bosso Central II
3	Beji ward	-
4	Maitumbi	Maitumbi
5	Kampala ward	-
6	Mainkunkele	Mainkunkele
7	Kodo	-
8	Chanchaga	Chanchaga
9	Shata	-
10	Garatu	-

Source: INDEPENDENT NATIONAL ELECTORAL COMMISSION MINNA

4.3 PROCEDURE FOR DATA COLLECTION

In collection of information and necessary data, the researcher used both primary and secondary data in addition to other research instruments used in descriptive survey studies.

4.4.1 THE PRIMARY DATA

This is made up of structure interview questionnaire. In which a head of house hold was ask. Where the head is not seen then the spouse and where neither was available an adult member who has sufficient knowledge, On the topic was interviewed. About 100 respondent were selected randomly and interviewed. The interviewed was structured in such a way that respondent fill free in answering the question.

Apart from the above category of people interviewed during reconnaissance survey, people found around dumpsite were also chaloque with. Such people included adult coming to dump waste and scavengers.

4.4.2 THE SECONDARY DATA

The secondary data were source from textbook, thesis, journals, monographs, seminar paper, Newspapers report and other published and unpublished materials on waste disposal, management and environmental sanitation. This data were source and review in chapter three as literature review before the collection of primary data.

4.4.3 RECONNAISSANCE SURVEY

An extensive personal observation was undertaken with a view of making inventory of existing condition and assembling of back ground data of the sampling areas in Bosso, Maitumbi, Chanchaga and Maikunkele. These include the assessment of simply sites the mobility of people and their activities around the site.

4.4.4 INTERVIEW

Interview were conducted with individual directly involve in the management of our environment and sanitary issues. The people interviewed were staff of the agency

concerned with environmental issue such agencies include the Niger State Environmental Protection Agencies (NISEPA), Urban Development bear of (NUDB) and the sanitary inspection unit of the local government council. The people interviewed again are head of the house hold. The people interviewed were carefully chosen in stratified form to insure validity and reliability of information received.

4.5 DATA ANALYSIS

It is essentials to note that 100 people (responded) where selected from five (5) ward of the local government. In each selected ward head of the house hold, spouse and health workers. The respondents were interview. The interviewer question were group. The answer to the interviewed question are presented using percentage and graphs were employed for data analysis.

CHAPTER FIVE

5.1 DATA ANALYSIS AND DISCUSSION

This chapter is concerned with the study of waste disposal in Bosso Local Government. The chapter deals with results, analysis and discussion of finding. The interview-question were structure in line with the objective of the study. A total of 100 respondents were interview from five ward selected from the study local government. In analysis and discussion the data was representing the respondent number with percentage was also used.

TABLE 5.1 DUMPING WASTE IN COLLECTION POINTS INCINERATOR OR OPEN SPACE

	OPTIONS	FREQUENCY	PERCENTAGE
A.	Incineration (burning)	5	5
B.	Near by pit	35	35
C.	Open space or stream	15	15
D.	Dumping site	45	45
	TOTAL	100	100

The above (Table 5.1) shows that about 5% of the respondent dump their waste by incineration while 35% dump the waste in near by pits without considering the usefulness of the pit. Also about 15% dump the waste in open space or streams that lead to very filthy environment because wind and water carries these waste about. Lastly 45% of the respondent dump in dumping site and not even properly dumped.

The study reveals that majority of the people dump their waste at various dumping site.

TABLE 5.2 PERIOD OF DUMPING OR EMPTYING DUST BIN FROM HOUSE
HOLD

	OPTIONS	FREQUENCY	PERCENTAGE
A.	Daily Bases	70	70
B.	Weekly Bases	20	20
C.	Regularly	10	10
	TOTAL	100	100

Source: Field survey 2000

The above table shows that about 70 percentage dump emptied their waste from their waste from their house on daily bases because of the dust bin they have are very small. The dustbins are either condemns bucket, basins and others. While about 20 % percentage emptied their dust bin weekly because they have larger container like

drums that urban development board collect waste by major road by the owner house hold. Where as 10 percentages removes the waste regularly because they have access to open dumping or stream and other that uttered the filly.

Table 5.3 MATERIAL USED FOR WASTE COLLECTION FROM HOUSES

	OPTIONS	FREQUENCY	PERCENTAGE
A.	Drums	10	10
B.	Dustbin	5	5
C.	Cartons	20	20
D.	Cylophine bags	10	10
E.	Baskets, basin & others	55	55
	TOTAL	100	100

Source: Field survey 2000

After the interview, this table shows the material used by various houses to collect waste from their various houses base on their economic standard. The table shows that about 10% used drums, dustbin users are 5%, 20% of the respondents uses cartons. While basket, basin and other form the larger percentage forming 55%. In observing the containers some are not made for easy collection of waste and are not properly used. Refuses were thrown around the collection materials that facilitate them and other vectors breeding.

TABLE 5.4 TYPES OF SEWAGE DISPOSAL

	OPTIONS	FREQUENCY	PERCENTAGE
A.	Pit toilet	40	40
B.	Water system	30	30
C.	Uncompleted building	3	3
D.	Bush or near pit	17	17
E.	Drainage and streams	10	10
	TOTAL	100	100

The table above shows that about 40% defecate in pit toilet and water system takes 30% of the respondents. Uncompleted building were 3%. While bush or near by pit take about 17% and drainage and stream amount to 10% of the respondent which shows that about 30% of the respondent defecate that lead to environmental pollution of water sources. The villages around those streams that pass through the study area drinks from the contaminated water. Examples of such rivers are river Jikpan that passes through Federal University of Technology main campus and river Chanchaga. Below are those river serves as source of during water to some villages like Gadu, Birji and Bako-pompo all within Bosso Local Government.

TABLE 5.5 SEWAGE COLLECTION AND DISPOSAL SYSTEM

	OPTIONS	FREQUENCY	PERCENTAGE
A.	Digging pit	28	28
B.	Mechanical system	60	60
C.	Abundant it for new one	12	12
	TOTAL	100	100

Source: Field survey 2000

The above table shows how fills up toilet are emptied. About 28% of the respondent give answered that the dig pit near the fill up one and emptied the toilet manually into dig up pit. This gives chance for continuous usage of the toilet been emptied. About 60% emptied their toilet mechanically by using gully empties that draw away the sewage given chance of continuous usage. Through these systems lead to underground population and surface water contamination. Few of the repondent abundant the toilet and dig new one because they have available space in their houses.

TABLE 5.6 SOLID WASTE DISPOSAL TO PERMANENT SITE

	OPTIONS	FREQUENCY	PERCENTAGE
A.	Refuse van	40	40
B.	Tippers	45	45
C.	Pick ups and other	15	15
	TOTAL	100	100

The above table explain how solids waste are carry out to the permanent dumping site. About 40% form the collection by refuse van and not even properly used. They still live wind to carry some during transportation.

This littered streets and drainages. About 60% are carry in open vehicle like tippers and pick up which give total room for environmental pollution. Because wind takes most of the light solid waste back to streets, drainage and streams, this leads to environmental pollution.

TABLE 5.7 SANITARY INSPECTION BY ENVIRONMENTAL HEALTH OFFICE

	OPTIONS	FREQUENCY	PERCENTAGE
A.	Daily	-	-
B.	Weekly	30	30
C.	Irregularly	35	35
D.	Monthly	25	25
E.	On invitation	10	10
	TOTAL	100	100

The above table shows how the health officers perform their jobs. The table read that health officers don't go for daily inspection but weekly inspection because 30% of the respondent state that they see them weekly. About 35% state that health officers have irregularly visitation. And 25% of the respondent state that they visit them monthly while 10% of the respondent state they only come on request. When are sanitary problem, the report reach to the office, they then visit the area.

This table has show that sanitary officers don't perform their jobs. That is they don't go for the major responsibility. This gives room for improper disposal of waste from house. source field survey 2000.

TABLE 5.8 POSITION IN THE HOUSEHOLDS

	OPTIONS	FREQUENCY	PERCENTAGE
A.	Head of house	60	60
B.	House wife	20	20
C.	Others	20	20
	TOTAL	100	100

SOURCE FIELD SURVEY 2000

The above table represents position of the respondent. 60% of the respondent were actual people need for the interviewed. And 20% represent House wife that directly in charge of waste generation within the house while 20% represent other in the compound selected at the absent of the head.

TABLE 5.9 HOUSEHOLD SIZES

	HOUSE HOLD	FREQUENCY	PERCENTAGE
A.	<3 Persons	10	10
B.	3-6 Persons	30	30
C.	7-10 persons	35	35
D.	>10 Persons	25	25
	TOTAL	100	100

The above table shows the population of the respondent household. The house that has less than three (3) persons take about 10% and 3-6 persons were 30%. The house with population of 7-10 persons were 35% while the house with population greater than 10 persons has 10% of the respondent which shows that the population determines waste generation.

With reference to solid waste generation rate per individual per day ranges between 0.46kg/head/day to 0.56kg/head/day (World Bank Research Project 1985) and average of 0.51kg/head/day. Therefore the waste generation in Bosso local 1991 was

$$92,263 * 0.51 = 47054.13$$

Note: $p1 * 0.51\text{kg}$

$$=1991 = 92,264 * 0.51\text{kg} = 47054.13$$

$$\text{and by year 2000} = 978402 * 0.51\text{kg} = 498985.02$$

By the year 2000 waste generation in using world bank formula 1985 was established

to about 498,985.02kg. The agency responsible for refuse collection can not meet up the collection because the population is increasing every day and night.

TABLE 5.10 AGENCIES RESPONSIBLE FOR SOLID WASTE COLLECTION AND DISPOSAL IN STUDY AREA

	OPTIONS	FREQUENCY	PERCENTAGE
A.	Government	82	82
B.	Community	3	3
C.	Non Governmental Agencies	10	10
D.	Individual	5	5
	TOTAL	100	100

The above table represent the agencies responsible for solid waste collection in the study area. About 82% of the total collection is done by government other agencies from 18%. This shows that government is over loaded and can not collect all solid waste within the study area. That is why pile of refuse are found within the study area dumping site some even collecting street making it narrow for vehicle passage.

TABLE 5.11 IS SEWAGE COLLECTION AND DISPOSAL

	OPTIONS	FREQUENCY	PERCENTAGE
A.	Government	10	10
B.	Community	-	-
C.	Non Governmental Agencies	3	3
D.	Individual	87	87
	TOTAL	100	100

The above table shows how sewage (liquid waste) are been collected and disposed. It shows that about 87% of total liquid waste is carried out by individual. If individual toilet or soak-away are filled up. He is responsible to call on appropriate organ to empty it which is mostly done by government employees. The golly-emptied belongs to government, if your toilet filled, you complained to urban Development Board or Federal University Of Technology. They will charge you according to the size of the toilet before they emptied it. that is why government and other take 13% of the toilet disposed.

CHAPTER SIX

SUMMARIES, CONCLUSION, RECOMMENDATION AND BIBLIOGRAPHY

6.1 SUMMARY OF FINDING

From the study and analysis of data collected, it shows that a number of factors usually determine the extent, characteristic and composition of waste generated. Such factors include population size and density education and income level, altitude and habits of people from the study it shows that area with higher population density such as Maitumbi, Bosso town and Chanchaga ward generate more waste than other places of the local government. Because other area has moderate population density.

On the nature of waste generate, the study shows that they are basically the same. The composition of waste can be attributed to level of income of the people that are mostly low and medium income earners.

Similarly the waste generated in Bosso local government are mostly domestic waste with a sizeable portion from commercial activities. This may be due to the fact that Bosso local government is not an industrial centre and most of the small- scale industries are products of consumable materials.

On the storage and collection of waste from homes, most houses used dustbin in form of Basket, condemn pans, nylon bags. The wastes are collected to near by dumpsite. The collection were made within the first three days influence by the number of people in the household and the size of the container use for storage. Those with

drums spent more days.

Open dumping are the most prominent method in used. Residence dumps their waste on designated dumpsites with few numbers of people throwing theirs into drainage or nearby pit. From the reconnaissance survey where these wastes piled up the residence do set fire on it thereby polluting the atmosphere.

As household members collect waste for disposal, house to house collections by the government agency or private was not in existence of the study. The dumpsite clearance were done by the government agency, Niger state Urban Development Board (NUDB) in collaboration with the staff of the local government sanitary unit from the reconnaissance and on the spot survey, a group of young men mostly within the ages of 13 to 35 are also contributing to waste disposal and management. This groups of scavengers, picked recyclable materials from the waste.

Poor knowledge, attitude and habits of people on ways of dumping waste constitute a major problem to efficient waste disposal and management in good sanitary of the city. For example nylon and papers are discarded any how, any where and any time by the residence irrespective of the educational level.

Above all, the most intricate problem to effective waste management has to do with poor funding. Fund provided to the agency is grossly inadequate. The Local Government that has the responsibility of waste management does it because of the magnitude of the waste generated.

In addition, absence of private initiatives in the waste management business further compounded the problems.

6.2 CONCLUSION AND RECOMMENDATION

Based on the findings, it shows that solid waste generation increases with the rise in high population. It was also discovered that household members collect refuse from homes to dumpsite.

Thus, the researcher felt to recommend that Government agency or Local Council sanitary unit should make adequate arrangement with the residence in provision of dustbin and collection of waste on regular bases.

Little fees can be charged on the services rendered to the public. This will also check the problem of indiscriminate dumping of refuse.

Private collective services can also be introduced through a private company that will go into contact in provision of collection and disposal of waste from homes.

On the open dumping system, site clearance, the agency (NUDB) responsible for collection of waste should be provided with enough fund in order to effectively carry out the responsibilities assigned to it. inadequate funding of the board was responsible for shortage of personnel, facilities, logistics and other resources for effective evacuation and waste management.

on the people attitude and habits the agency in collaboration with the mass media should embark on a vigorous awareness campaign on waste disposal poster should be used as well.

considering the enormous work involve in collection and disposal of waste, and the inability of local government to shoulder the responsibility, it has been argued that the agency responsible should be strengthened and granted more autonomy. Also, to

avoid inefficiency, private agency should be established at other local councils and financial and technical assistance required should be provided.

Lastly, as some of the waste generated and discarded are recyclable materials, government and private entrepreneur should go into business of recycling the waste.

The prospect for recycling is so bright in the sense that in Egypt and other European countries waste is being recycled as raw materials. In Nigeria the rate of recycling is still at its infancy but a sizeable number of young men are already into it;

If and when these are done, the prospect of effective management of waste is bright. This study has concentrated on waste disposal in Bosso Local Gov. area. The result may be slightly different when other states are used. It is advised therefore that similar work be carried out in other places.

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