

WASTE COLLECTION AND DISPOSAL

(A CASE STUDY OF RUJE LOCAL GOVERNMENT AREA-ABUJA)

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DECLARATION

I hereby declare that this research project has been conducted by me under the guidance of **DR. NSOFOR** of the department of Geography, Federal, University of technology Minna, and have neither copied someone's work nor have someone else done it for me.

Credit has been given to writers whose works have been referred to in the project.

JIGO ALHASSAN AHMED

DATE

CERTIFICATION

This is to certify that the project titled “**THE WASTE COLLECTION AND DISPOSAL, A CASE STUDY OF KUJE LOCAL GOVERNMENT AREA-ABUJA** is an original work undertaken by **JIGO ALHASSAN AHMED PGD/GEO/9962** and has been prepared in accordance with the regulations governing the preparation and presentation of projects in the Federal University of Technology, Minna.

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DEDICATION

I dedicate this work to my **PARENTS**

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My grateful thanks are due to the many people in practice, teaching and research who have introduced me to the field of Environmental Management. I am particularly grateful to my colleagues at Federal University of Technology Minna and the department of Land, Planning and Survey, Kuje Local Government Area, Abuja who have help me to develop my interest and to the staff members who have devoted their time to go through and make necessary corrections in my work. But above all I owe a special debt of thanks to my wife. She gave her full co-operation and support during the period of study. Without her help and encouragement the project would never have been completed successfully.

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ABSTRACT

This study examined critically the findings from the survey conducted on waste collection and disposal system for the study area, Kuje, Local Government, FCT Abuja. From the survey the information that was used, were the same problems associated with waste generally.

Further more, the information revealed that these problems are detrimental to the public and the local government area. Accumulations of waste, inadequate transmission of waste and disposing of them are causing these problems. However, it was found out that dumping of refuse anyhow has an adverse effect on man and the environment (environmental degradation).

Our findings suggest that the board in charge should provide appropriate collection centers for the entire people of Kuje Local Government, because most of the problem occurred as a result of lack of collection centers, lack of bins in the appropriate areas to ease collection and disposal of the waste.

CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND OF THE STUDY

It is all known the method approach to the disposal of our waste and lease of all with the pollution resulting from inadequate waste management.

The study area under research has shown that the area has been dumping areas for solid waste, but poorly controlled. Hence there is no reliable agent or organisation in charge of collection and disposal of waste, which lead to careless dumping of waste, thereby causing a lot of problems such as blockage of drainages, roads, flood, land degradation etc.

The solid wastes are mainly collected in a few located at various centers by the local government area. Some use drums, rubber arms, then taken away to the out sketch of town, village and whenever they forms heaps, they are burnt down either through bush burning or set fire on it by the staff from Health Department of the Local Government Area.

Problems faced by the inhabitants in the disposal of waste in the study area is lack of facilities, such as vehicles, enough dust bin, sanitary inspectors in doer to facilitate the waste disposal else where.

When this solid –waste are being dumped and burnt on the out sketch of the town they emit gas into the atmosphere such as H₂S, CO, N_oX, etc. When it reacts with atmospheric particles, they pollute the environment and when this gas are inhaled they damage our essential organs such as lungs, liver etc causing diseases such as cancer, swelling of the body etc.

However, since the efficiency of management is a function of the relationship between the rates of generation and disposal, the number of person cannot determine environmental quality. Also it depends on the quantity and quantity of equipment at the disposal of solid waste disposal unit. The Kuje are council is unable to cope with the waste generated daily hence there is need for improving the existing poor situation in Kuje Area Council. It has also been observed that the management lacks accessibility for easy collection and disposal.

1.2 RESEARCH QUESTION

The following are the research question, which this project tried to answer.

Question 1: Does the study area have places for collection and disposal waste?

Question 2: How are the wastes collected and disposed of in the study area?

Question 3: What are the problems encountered during the collection and disposal of waste?

Question 4: What are the impacts of dumping waste on the environment?

Question 5: Does the study area have organisation or agents responsible for the collection and disposal of waste?

1.3 STATEMENT OF ASSUMPTION

Having seen some of the problems associated with the area in study, the area council should encourage the proper collection and disposal waste by providing more collection and disposal units for waste.

In the area of study, waste collection and disposal is so careless in done that they do not consider the health hazard involved. They have no equipment, vehicles to transport waste to dump them at a far distance, as a result, pollute the environment by producing unpleasant odour in the village which need proper care and monitory by all individual in the village to avoid outbreak of any disease caused by some flies that may settle on the waste and latter feed on the food to be eaten by man.

The Federal Government especially the management of Federal Environment Protection Agency (FEPA) may have to send people of this at least every three months despite the sanitation day of every end of the last Saturday of the months. Because, some rural areas do not care so much about this last day of the month and to be able to present their periodic problems in the area, they have deficiency to the Federal Government. By so doing, I believe there will be fewer problems of waste generation and disposal in our rural areas.

1.4 PURPOSE AND SIGNIFICANCE OF STUDY

The purpose and importance of the study in waste collection and disposal in our environment is to appraise the existing condition of collection and controlled the disposal system of waste of Kuje area council FCT Abuja.

1.5 OBJECTIVES OF THE STUDY

1. To identify the problems associated with refuse in Kuje Local Government Area.
2. To suggest ways in which indiscriminate refuse disposal could be stored in Kuje local government.
3. To recommend ways by which waste could be collected and disposed.
4. To suggest how to ensure that waste in Kuje is properly maintained according to the rules governing the disposal of this waste, to avoid emission of odour in the environment.

1.6 SCOPE AND LIMITATION OF THE STUDY

This research was able to cover some selected areas of the study area. The study area is wide and some areas were not visited because of in accessibility. These areas however are few and may not be a treat to the research project.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 DEFINITION OF WASTE

2.2 INTRODUCTION

When the environmentalist School of thought propounded the theories of environmental possibilism and probabilmism as being superior concepts to environmental determinatism for explaining man-environment relationship little did they know that the "Conquest of the environment" would lead to its destruction. Man in the recent past has been faced with a rapidly deteriorating environment, which are mostly due to indiscriminate waste disposal attitude of the inhabitants. The deteriorating environment can also be as a result of deforestation, excessive gaming, marine pollution, atmospheric pollution, land-use and misuse, which lead to gully erosion and flooding. Solid waste disposal problems, automobile and industrial and pollution among others are also problem of the environment.

The United Nations has embarked on a global awareness campaign through its **GLOBAL ENVIRONMENTAL OUT LOOK 2000 (GEO 2000)**. In the developed countries of Europe and America this awareness is high and it's the cause of several policies and strategies aimed at environmental preservation and conservation. The awareness campaign has been introduced to the developing

countries. For instance, in Nigeria, the Federal Government has introduced various laws on the preservation of the environment. This can be seen through the establishment of commissions e.g. FEPA etc. Many Non Governmental Agencies (NGOS) have sprung up to discuss environmental degradation in Nigeria, and proffer solutions. The country's, Federal Environmental Protection Agency (FEPA) with its branches in all the States including Abuja, monitor environmental quality. Very recently, the government established the Federal Ministry of the Environment to oversee the country's environmental problems.

Waste is any unavoidable material resulting from domestic activities or industrial operation for which there is no economic demand and which must be disposed off.

Modern technology is extending stress on the environment, breaking some vital link in the web of physical and biotic potentials processes that maintain the ecological system in which man lives. The new technology that brings such high productivity and comfort also destroys man's biological capital such as air, water and other parts of ecosystem that must supports him. They include the industrial waste, commercial waste and domestics waste. These pollutants constitute a nuisance into our environment causing discomfort and health hazard. They can be carried along far distance by air or by water, threatening the health, lifespan, recreations and personal hygiene.

Rivers, streams, ponds and lakes are polluted when waste products are discharged in them. Man's waste products have generally been hauled along with waste for disposal in open gullies, valleys, or abandoned pits. These disposal methods lead to more deterioration of the local environment around the dumping grounds. This is because some wastes attract different insects and vermin. The dumping ground also destroys the natural beauty of the environment around us.

AIM AND OBJECTIVE

The gathering and disposal of solid waste becomes a major public health issues of our time and this needs some urgent attention and management especially in our cities have become one of the most intractable environment problems facing us today. Therefore it is the aim of this project to examine the collection and disposal of waste generation and the technique of management.

2.3 SOURCES OF WASTES GENERATION

Waste is defined as the non-gaseous and non-liquid waste resulting from domestic activities of the inhabitants of a particular residential area (Adedibu, 1987).

The phenomenon of waste generation is common to all human communities and often leads to urbanization process. In other words urbanization as a spatial process has its common constraints. For example, when population explodes, consumption tends to be elastic, and people create refuse from all sorts of materials used as packaging materials. Thus man's activities on domestic,

commercial and industrial processes produce some undesirable effects, which are pollutants of all categories. According to Adedibu and Okekunle (1989) rapid population growth is a significant factor that is causing poor environment sanitation. Nevertheless, there are other factors such of inadequate knowledge of the composition of solid waste, the rate to which population generates waste, inadequate and uncoordinated infrastructural facilities for waste disposal and rural-urban drift. Adedibu, (1986) described the phenomenon of source of waste generation as a result of changes in wages earning by the workers. For instance higher earning can lead to a great prosperity of buying specifically the packed items which can also increase waste generated by the high-income class.

Federal Environmental protection Agency (FEPA) has categorized wastes into three main types as follow:-

- a. The municipal wastes arising from residential institutional, commercial and stress left over include pieces of paper, food wastes, plastics and rubber, pieces of metal, tins, cans, leaves and grasses among others.
- b. The industrial wastes such as cartons, boxes, crates, scrapes of building materials, wood and cellulosic materials, chemical wastes-oil and plastics
- c. Toxic wastes. This category of waste is very harmful to health. For example, carbon monoxide emitted from the exhaustible fumes of cars, machinery, chimney, generating plants and other combustible items.

The sources of the waste generated increases as income rises but at a smaller unit (rate) than income (Adedibu, 1987)). He opined that amounts of effluent discharge into the environment is related to the population composition, size and per capital income gives rise to the production and combustion of goods and services and thus the discharge rate is increased. Lester (1987) says without population, there would be no pollution and that pollution is the price of progress. However, the qualification of the amount of waste generated cannot be easily determined through a monocausal argument. In the sense of the world. Adedibu, (1985,1989) observed that the amount of waste generated in every environment varies from individuals and from one are to the other. But the absolute amount of waste generated per person has not been fully established.

The spatial variation socio-economic and demographic characteristic as well as the level of technological development of an environment has been found to have influenced waste generation effort. For example, Adedibu (1985) noted that the economic activity of any community would determine to a great extent the quality and type of waste generated by the people. In an Agrarian economy for instance, the common types of wastes are usually in the form of leaves, food remains, harness wastes among others. But in industrial economy, tin cans, plastic packages among others are common.

TABLE 1 SOURCES OF WASTE GENERATION

| TYPES OF WASTES | GENERAL COMPOSITION | GENERATION SOURCES |
|--------------------|--|---|
| Garbage | Waste from preparation of cooking, left over, market waste from storage and sales of wares | Household (kitchen), Restaurants, Stores and markets. |
| Rubbish | Combustible papers, carbon unused papers, wood, rags | Office households, market |
| Ashes | Residues from fire used in cooking. | Kitchen, markets. |
| Street trash | Leaf liters, corncobs, fruits peels | Restaurants, stores, passed by food vendors. |
| Abandoned vehicles | Unwanted cars, motorcycle and bicycle parts, woodlogs | Roadside machines, lumbering activities. |

SOURCE: America Public Works Department (1968) from Akinjide, O. (1998) Current Issues in Nigeria Environment. Davison Press, University of Ibadan, Nigeria.

Mabogunje, (1974) further argued that the incidence of a population explosion in an area enlarge the size of household and thus translating into heavy waste generations. Generally the source of waste generation is a function of many interaction variables.

2.4 WASTED DISPOSAL

The menace of solid waste disposal has been a very serious problem facing most urban centers in developing countries today. Rapid urbanization has in no small measure contributed to waste generation and sanitation problems in our cities. According to Berry et al (1974) rapid urbanization along side the rising rates of industrialization have created great concentration of waste than the cities system can absorb. More wastes are generated in the third world countries than ever before (Adedibu, 1983). These wastes and their products are the cause of a great deal of environmental problems. Unfortunately, the methods of solid waste disposal are not well defined while management of the waste is grossly inadequate.

Greater attention however, needs to be paid to the problems of waste disposal. This is because, about 5.2 million people including 4 million children die each year from diseases caused by improper disposal of sewage solid wastes. In developing countries, less than 10 percent of the urban wastes are treated. Only a small proportion of the treated waste meets the acceptable standards (Sanio, 1998).

In addition, the system of waste disposal pollutes water, air and soil resources. These exceed adequate steps being taken to manage and disposal of wastes more efficiently in the urban centers. It is estimated that by the year 2025, about 70 percent of the World's Population will be urban and urban wastes will be more than quadruple (Sanio, 1998). This trend in waste generation should be a major source of concern to urban administrators stressing again the need for proper management of solid wastes in the urban centers.

The processes involved in the transformation of the solid waste in Kuje Area Council FCT, Abuja are basically as follows:-

1. storage
2. Resources recovery/recycling
3. collection and Transportation
4. disposal
5. Organization and Farming

2.5 STORAGE

This type of storage of solid waste can be divided into separate and communal storage unit, with regard to Kuje Area Council both methods of storage are in use. Separate storage units are being standardized, non-standardized. The standardized container prepared to non-standardize.

In Kuje Area Council, it is found that various storage containers are in use. These are rectangular walled waste bins, metal containers, cylindrical structure drums, big dish as cartons and an open space which often lead to big mountain of refuse at various points. These system of waste disposal are inadequate and overflow onto the main/major roads. Most of the household cannot afford suitable containers, which result into burning of such refuse.

COMMUNAL STORAGE UNIT

This is the place whereby a number of household or compound depend on one storage unit.

In Kuje Area Council there are almost 50 housing unit. This result to the problem of insufficient use of the storage units, thus most of the households have developed the habit of indiscriminate of dumping solid waste. It has been observed that the storage units, which were supposed to be full of waste, were in most cases empty due to the non-patronage of the storage unit provided by the Area Council.

COLLECTION AND TRANSPORTATION

Collection and transportation of refuse/waste materials differs from country to country, cities, towns and from one point of town to the other. In the study area (Kuje) collection and transportation of refuse is mostly carried out through the use of wheelbarrow and other small containers and are deposited to the storage units

which will later be collected and transferred by tippers hired by the area council for final disposal.

The collections of refuse/waste material in most developing countries are inadequate and ineffective. In the developed countries, however waste management is very effective and adequate. Hence there is a stringent law about waste disposal and environmental protection.

WASTE DISPOSAL STRATEGIES

The disposal of waste is defined as the deposition of waste material that has negative to the society. This material is deposited far from settlements in order to prevent health hazard to the people and other living organism.

Open dumping system on land and water systems are the common method used in most of the developing countries such as Nigeria. Although this method is simple and cheap, it poses serious threat to the environment and public health.

Solid waste can be processed so that some of its components can be recovered for other useful material, an example of this method is the recycling system. The only two realistic option for disposal are the oceans and on land. Generally the former is presently forbidden by the Federal law and is becoming similarly illegal in most other part of the country.

In the United States and tip in Great Britain the dumps is the least experienced means of solid waste disposal. And this was the original method of choice for almost all-inland communities. The operation of a dump system is simple and involves nothing more than making sure that the truck empties out the waste at a proper spot/area. The problems of dumpsite are the emergence or odour, air pollution and insects at all the dumps which can cause serious health and aesthetic problem.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

The method of investigation in this project work will be through the use of prepared questionnaires, which will be distributed among the population of, Kuje the study area. All the responses received for the questionnaires will form the basis of the data. Apart from the question, the ground truth assessment of the study will add to the information required by the project work.

This information is collected by means of oral interview.

3.1 METHODS OF DATA COLLECTED

The main method of collecting the data for this research project is through oral interview, which was administered to the people in Kuje area council and its environs.

Other methods of data collection employed for this project include by the researcher are field observation and extract from various publications such as newspapers, library text and course notes. Information was also obtained from the environment monitoring department of the area council at Kuje. Sectional heads for various units were also interviewed.

3.2 SAMPLING PROCEDURES

The questionnaires were distributed to people living in Kuje, and its environs using random sampling of the population. The scattered populations were chosen because closer informations need to be received on the situation of waste management in majority of the study area.

The oral interview which was designed for collecting information from people living in the area council of Kuje area can be seen ~~below~~

Oral interview for data collection for solid waste disposal

1. List the types of solid waste disposal system you practice in this area

- | | |
|---|---|
| A | B |
| C | D |
| E | F |

2. Are the waste disposal system practices in this area capable enough to keep this environment clean from being polluted?

3. List the methods of solid disposal management

- | | | |
|---|-----|-----|
| A | B | -50 |
| C | -20 | D |

E

F10

4. What are the importances of solid waste management in the environment?

A

B

C

D

5. To what extent did government interfere in solving the problem of pollution due to waste in this area.

DATA ANALYSIS

The data collected were analyzed through the use of percentages and tested.

The data from the questions were tabulated. These data were then use for various discussion of the result.

CHAPTER FOUR

4.0 DISCUSSION OF RESULT

A total of 120 questionnaires were sent out to respondents and 94 completed questionnaires were returned, representing 78% of the total number of questionnaires sent out. The responses are as follows:- Question 1: Which of the following drainage system are more nearer to your house?

TABLE 4.1:

| Frequency | Percentage |
|-----------|------------|
| 19 | 20.2% |
| 20 | 21.3% |
| 30 | 32% |

Of all the waste generated in the study areas, Polythene bags constituted the largest. These Polythene bags were mostly waste from pure water, Sobo drinks and other commodities sold in polythene bags. Polythene bags constitute about 32% of the total wastes generated. This is followed by food particles of different categories like oranges, cassava, yam, mango etc.

Question 2: How do you handle household waste?

TABLE 4.2

| Response | Frequency | Percentage |
|-----------------------------|-----------|------------|
| By throwing them any where | 64 | 68.1% |
| By storing them in dustbins | 10 | 10.6% |

Wastes generated from the study area are largely thrown away into nearly drainage system instead of being stored before removal. About 68.1% of the total wastes generated are simply thrown away. This also indicates that the use of dustbins is not in practice. Only 10.6% of the respondents store their wastes before they are collected for disposal. These are mostly the enlightened people that occupy bungalows or flats with modern system of waste disposal.

Question 3: How regular are wastes removed from dumping sites?

TABLE 3:

| Response | Frequency | Percentage |
|-------------------------------|-----------|------------|
| Immediately wastes are dumped | 11 | 11.7% |
| Not removed at all | 10 | 10.6% |
| Removed after several weeks | 63 | 67% |

Table 3 above indicates that the bulk of the wastes dumped at the various dumping sites within the study area are abandoned for several weeks without removal. 67% respondent indicated that wastes are abandoned at the dumping sites local channel for a long time before removal. This indicates that the waste sometimes block the effective passage of water. This could cause flooding of water which could lead to damage of properties.

Question 4: When do you observe wastes increases in Kuje

Table 4.4

| Response | Frequency | Percentage |
|--------------|-----------|------------|
| Rainy season | 57 | 60.6% |
| Dry season | 17 | 18.1% |

Question 6: People can assist in proper waste management by:-

TABLE 6:

| Response | Frequency | Percentage |
|---------------------------------|-----------|------------|
| Throwing the wastes every where | 25 | 26.6% |
| Storing in dustbins | 49 | 52.1% |

About 52.1% of the respondents have shown that the government should employ labour (direct involvement of government) of dustbin is the as the best way to help in management. About 26.6% of the respondents however indicate that throwing the wastes away is the best way to deal with the solid wastes. This indicates that majority of people will be provided by the government.

Question 7: How can the government improve waste and local channel/drainage management

Table 7:

| Response | Frequency | Percentage |
|--|-----------|------------|
| Early removal of wastes from channel/drainage system/environment | 62 | 65.9% |
| Increasing public awareness | 12 | 12.8% |

Source: Compiled by the Author

Of the whole wastes generated within the study area 60.6% is in the rainy season. This may be due to the additional agricultural wastes that are abundant during the period. There is only about 18.1% increase in waste generation during the dry season.

Question 5: People do not use dustbin but prefer local drainage due to

TABLE 4.5

| Response | Frequency | Percentage |
|----------------------------|-----------|------------|
| Poverty | 27 | 28.7% |
| Ignorance | 14 | 14.8% |
| Not provided by government | 33 | 35.1% |

Majorities of people in the study area constituting 35.1% of the respondents have indicated that people do not use dustbin but prefer to dump their wastes into local drainage because the government does not provide them. This is followed by 28.7% of the respondents who attribute the lack of usage of dustbin to be due to poverty. The remaining 14.8% of the respondents attributes the reason to ignorance. It implies that they are not aware of danger that can be caused through the blockage of these drainage systems.

Table 7 above indicates that about 65.9% of the respondents in the study areas have indicate that the government can improve the waste and local channel/drainage management by quick removal of solid wastes from the dumping sites. This has also shown the level of distributance heaps of refuse in and around the environment constitute to the people in the study areas. The 12.8% response means that people do not see public awareness as important as immediate removal of wastes from within and around the environment.

Question 8: Which is the best way to dispose off solid wastes?

TABLE 8:

| Response | Frequency | Percentage |
|-----------------------------|-----------|------------|
| The use of channel/drainage | 00 | 00 |
| Burning | 10 | 10.6% |
| Dumping into the bush | 41 | 43.6% |
| Dumping within the town | 23 | 24.5% |

Source: Compiled by the Author.

About 43% of the respondents in table 4.8 above have indicated that dumping the solid wastes inside the bush is the best to dispose off solid wastes. This is an indication that more people are aware of the dangers of having large heaps of wastes around them. About 24% of the respondents have shown that dumping within town is still the way to improve solid waste while the remaining 10.6% of the respondents are in support of burning the wastes. It is to be noted that non of the respondents are in support of dumping waste in drainage channels, this implies that majority are aware of the danger of erosion and flood.

Question 9: Which of the following hazards is more disturbing if drainage channels are blocked with solid wastes?

Table 4.9

| Response | Frequency | Percentage |
|-----------------------------|-----------|------------|
| Damage of properties | 13 | 13.8% |
| Offensive smell | 25 | 26.5% |
| Flooding of the environment | 36 | 38.2% |

Source: Compiled by the Author

In table 4.9 38.2% of the respondents believed that flooding of the environment is more injurious this could lead to inaccessible road and make movement very difficult. This is because every household near the flooded channel are uncomfortable due to the muddy and wet ground 26.5% of the respondents are of the view that offensive smell from the dumping sites is more distributing when wastes are mixed with flooded water. Only 13.8% of the respondents have pointed to damage of properties to be the most distributing hazard of channel blockage

Question 10: Which of the following is a more disturbing effect of smoke nuisance?

TABLE 4.10:

| Response | Frequency | Percentage |
|----------------------|-----------|------------|
| Reduced visibility | 12 | 12.7% |
| Breathing difficulty | 14 | 14.8% |
| Eye irritation | 48 | 51% |

The largest number of respondents constituting 51% sees eye irritation to be the most disturbing effects of smoke nuisance from dumping sites. Breathing difficulty comes next with 14.8% of the respondents in support while reduced visibility comes last as the number disturbing effect of smoke nuisance and supported by 12.7% of the respondents.

Question 4.10: Which of the following acts causes the blockage of drainage?

TABLE 4.10:

| Response | Frequency | Percentage |
|--|-----------|------------|
| Solid wastes falling into drainage From dumping sites | 9 | 9.6% |
| Wind blowing wastes into drainage | 19 | 20.2% |
| People directly dumping wastes into drainage | 46 | 48.9% |

48.9% of the respondents in table 11 believed that drainage in Minna are blocked by refuse directly thrown into them by the people while 20.2% believed that the waste in drainage are blown in by the agent of wind. Only 9.6% of respondents see the blockage to be due to direct falling of wastes into the drainage from dumping sites thereby resulting in blockage.

Question 12: Which of the following may happen due to blockage of the drainage?

TABLE 11

| Response | Figure | Percentage |
|-------------------------------|--------|------------|
| Offensive smell | 24 | 25.5% |
| Flooding of surrounding areas | 49 | 52.1% |

Out of 94 respondents in table 11. 49 people representing 52.1% consider the effect of the blockage to drainage to be flooding of the surrounding areas while the remaining 24 people representing 25.7% see offensive smell to be what is likely to happened due to drainage blockage.

4.1 **GROUND ASSESSMENT**

On the ground assessment, the study indicates that the whole environment had scattered presence of one type of solid waste or the other. There were however limited quantity of waste in the streets due to hard work of the Federal Capital Urban Development Board who are always seen sweeping the streets, particularly the main street that runs through Kuje.

The solid wastes dumping sites are located in some strategic locations in Kuje and its environment. Most of the dumping sites have grown into heaps of solid wastes and are very close to drainage channels. The height of the wastes kept on growing because of non-collection of wastes as soon as they are dumped. It is possible to have some parts of the wastes that has been dumped for several weeks without collection.

The composition of the wastes is largely polythene bags. Some have been dumped for several months while some are freshly dumped. Apart from the polythene bags

raw and cooked food wastes were also noticed in large quantities. There were also little scattered presence of metal and rubber wastes around the dumping sites.

Most of the channels/drainage systems visited were in a terrible state of offensive smell emanating from the rotten garbage and other rotten materials. This is as a result of the mixture between wastewater and rotten garbage. The solids wastes from all the dumping sites that are close to drainage channels are threatening to or have completely blocked the drainage of run off from rain water across the channels. Where the dumping sites are close enough to drainage systems the wastes are seen falling inside the drainage system.

Some wastes are also set on fire because of irregular collection. The fire produces huge smoke nuisance that spread over a wide area surrounding the dumping site. Animals like Goats, Chicken, Dogs etc are seen mouth-probing into the wastes looking for some food. These animals contribute in scattering the wastes all over the dumping sites. Looking along the modern drainage system in Kuje, there are areas that are blocked by the solid wastes.

EROSION:- While flooding is a seasonal problem, erosion produces a rather permanent problem in some locations of Abuja especially Kuje, Plateau, Gombe etc.

Erosion is so severe that the roadways have been worn away and reduced making movement of vehicles difficult. In some areas of Kuje (FCT) and Enugu, even natural drainage receiving run-off from the urban areas show signs of both erosion and sedimentation. Another aspect of urban erosional problem is the erosion pavements of houses and the foundations. This has led to the collapse of fences, some measures to control erosion by urban residents includes dumping of huge sacks of sand in erosion areas and gully heads. Another method is making of basket like structures to aid deposition of sand (pickles George 1941)

HEALTH RELATED HAZARDS:- Environmental degradation may also result from poor storm water management in the urban centres. It is a know fact that many areas that are not well drained serves as suitable ground for breeding of diseases carrying pathogens some of the present drainage channels are a maniac to public health and welfare (Jackson M.H et al 1966). The act apart from polluting the air, contribute in the spread of various waster borne disease such as typhoid, Gastreutorities, Amebiasias, Arsenic poisoning such fouled water can gain passage to public tap through broken water pipes in drains. Where clearing of drainage channels are attempted, no provision is made for the disposal of the solid waste from the cleared area. The wastes removed from the drainage channel are pitted up by roadsides, which eventually end up again in the same channel. The stagnation of water and the decomposition of debris result in the production of highly

undesirable and offensive odour, which can be hazardous to the health of the populace.

Planning of urban drainage channels is an important aspect of planning of an urban area like Kuje, because of its attendant consequences. In Nigeria, flooding and erosion are the two major drainage problems that are rampant after heavy rainfall. Many roads, residential and non-residential compounds or open spaces are usually flooded. It does not only block roads, but also damage houses and properties worth million of Naira. Huge quantities of sands are normally deposited on roads causing damage to the asphalt used in road construction, which usually weakens and disintegrates the road when subjected to prolonged period of floodwater. Drainage has been one of the pressing problems in urban areas. In urbanized environments, the infiltration capacity of the ground is further reduced by the replacement of vegetal ground cover with a lot of impervious surfaces. According to Leopold (1986) of all the land use changes affecting the hydrology of an area, urbanization is by far the most hazardous.

Urban drainage problem is a phenomenon, which has got the attention of many environmentalists and government. As Lazarus (1978) said it is generally accepted that the trend towards more intensive urbanization existed in the United States and in nearly all other nations will continue through the remaining parts of the century. The hydrology of urban areas is quite complex. This is evident in our

urban centres where problems are on increase with increasing urbanization. The demand for better a study of the growing magnitude of urban drainage problems and the in ability of traditional method of dealing with the problems needs to increase.

CHAPTER FIVE

5.0 FINDING

The outcome of the data analysis and the general assessment of the study area have shown that the most common drainage system is the local ones which are mostly constructed by the various landlords. This construction terminates at the end of their house/building. The fact that industrial growth is still low within the study area, industrial wastes are not yet a disturbing phenomenon. It is however disturbing that dustbins are not in use (see table 2) neither by the households nor centrally by the community. This reason contributes to the general filthy condition of study area. If all wastes are carefully stored in dustbins whether household or community based and the wastes are subsequently collected and disposed off solid wastes will not have littered every where as it is now this would have minimize the blockage of channels. Apart from the reason given in (table 5) which is non-provision of dustbins by government, the issue of poverty is also strongly part of the cause of non-usage of dustbins by the people. Thus they resulted in dumping their wastes in local channels/drainage system.

The dumping sites within the study area were hygienically in a miserable state. Infact, the dumping sites are eye sores. Wastes are continuously dumped but are not regularly collected. It is even difficult for people who come to dump their refuse to reach the central point of dumping so that refuse is deposited anywhere

near the dumping site. In most cases, however, wastes are dumped in channels so that the force of the water/rain can carry the waste elsewhere. When the rain stops the dumped wastes are left in the bed of the channel and eventually the wastes will block the channel, which result into flood.

Apart from the unsightly nature of these dumping sites there is also the problem of offensive smell from the rotten materials concealed in the heaps of wastes. The smell even increases during intensive heat when decomposition rate heightens. The smell makes life seriously uncomfortable for the inhabitants of the areas with dumping sites. Further more, domestic wastewater and rainwater causes offensive smell when they mix with rotten solid waste.

Most pedestrian paths close to the dumping sites are completely blocked. People who normally should pass through the blocked road path are forced to take alternative route. The drainage systems close to the sites are also threatened with blockage. There are areas along the large drainage systems in Kuje where solid wastes have accumulated to the extent that some parts have started blocking. The closeness of some dumping sites to the drainage system may result in some wastes falling inside the drainage system but people also throw wastes directly (see table 1) into the drainage system.

A very disturbing phenomenon in connection to the dumping sites is the smoke nuisance. Most of the dumping sites are always on fire producing clouds of smoke nuisance into the atmosphere. Apart from the effects of this smoke in climate change it makes the whole environment uncomfortable for living. The smoke causes eye disturbances (see table 10) which may lead to more serious eye problems if exposure continues.

Ground truthing reveals that domestic animals are always found around the dumping sites and drainage channels. Since the life of these animals are related in one way or the other to the life of human beings there is the fear of disease transmission from one type of animal to man. Animals like Goats can get poisoned from dumping sites and die. If such a Goat is unknowingly eaten it may have some effects on man. Rats are known to transmit disease known as plague to man. The continuous access to dumping sites and drainage channel by rats therefore poses some danger to man.

Drainage that are constructed to enhance water flow may result in flooding. Several parts of the drainage system are gradually growing weeds whose growth is encouraged by the fertility of the wastes washed into the drainage or deposited into them. If this situation persists in the next few years there may be flooding which may result into lost of properties and sometimes lost of life.

The irregular collection of wastes and immediate clearance of channels is no doubt contributing to the hopeless situation of the areas. The Federal Capital development authority lack adequate equipment for wastes and drainage channel

management. There are few open tipper lorries which, compared with the volumes of refuse generated, are inadequate. Non Governmental Organization like Julius Berger usually assist the Federal Capital Development Authority with vehicles whenever a cleaning exercise is conducted at various sites of the study area.

There is clearly no presence of legislation that checks the activities and conducts of people towards the environmental protection. What the community uses as environmental sanitation laws are a set of laws that are decades old and can no longer stand the test of time and circumstances. The public health edict in existence is a product of Military Government of 1984. The edict is inadequate to be able to address the present environmental complexities and its punitive provisions are watery. Human beings no matter how mindful about environmental purity should have set of laws by their side as a reminder.

5.1 CONCLUSION

It clearly appears that the area council and Federal Capital Development Authority have not done enough in terms of the provision of effective and adequate manpower and equipment to deal with the issue of solid waste and poor drainage channel system management. The people on their own part appear to be either ignorant of or socially disabled to provide dustbins for use. This turns every available space of land a potential dumping site.

Finally, the absence of effective and comprehensive legislation against acts that promote environmental degradation is a contributive factor in the filthy state of the environment in Nyanya.

5.2 RECOMMENDATIONS

The existence of dumping sites in the study area is not acceptable and should be stopped. All the wastes collected should be taken to the bush far away from the town and dumped. This becomes necessary as an interim measure because there is no local technology that will reduce the wastes into some useful materials and all the other methods of disposal earlier discussed will not be able to cope with the volumes of refuse generated. The wastes, after a long time can be used by farmers as manure. As for the polythene bags, it is impossible to stop their usage and they do not decay like other types of wastes. In the absence of a technology that will reprocess them, they have to be taken outside the town like other types of solid wastes.

For the above recommendation to be reasonable there should be the provision of dustbins of smaller size for households to store all the refuse generated. A better and well-protected channel should be constructed. A bigger size dustbin should be provided at particular locations to serve a number of households. This should be accompanied by the provision of adequate and effective manpower and equipment that will collect the wastes from various points at regular intervals. The

government or the solid waste management agency can charge some fees from people who use the dustbins. This will go along way in supplementing the cost of waste management. This will also avoid the local channel or drainage system from being used as dumping sites for solid waste.

A strong public awareness campaign regarding the dangers of depositing wastes every where and the advantages of using dustbins should be established and every measure taken to keep it alive for as long as necessary.

Finally, a set of legislation should be promulgated to check the activities and conducts of the people towards maintaining a clean environment. The legislations should be strong enough to deal with any one, no matter his social position, who contravenes any of the environmental protection law.

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