# REFUSE MANAGEMENT IN NASARAWA TOWN IN NASARAWA STATE

THIS PROJECT IS SUBMITTED TO THE OF GEOGRAPHY IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF POST GRADUATE DIPLOMA IN ENVIRONMENTAL MANAGEMENT

***BY***


**AHMED GARBA MOHAMMED**

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**DEPARTMENT OF GEOGRAPHY**
**SCHOOL OF SCIENCE AND SCIENCE EDUCATION**
**FEDERAL UNIVERSITY OF TECHNOLOGY**
**MINNA. NIGER STATE**
**NIGERIA.**


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## APPROVAL PAGE

This is to certify that this project is an original work undertaken by **Ahmed Garba Mohammed** PGD/GEO/79/2000/099 and has been prepared in accordance with regulations covering the preparation and presentation of projects in Federal University of Technology Minna Niger state under the supervision of:

26/9/2001

**Dr. Akiyeye P.S Shola**
(Project Supervisor)

External Examiner

27/9/2001

**Dr. M.T Usman**
(Head of Department

**Febuary 2001**

# ABSTRACT

Due to rapid urbanization in Nigeria in the past three decades, waste management has become a major problem. Man's guided development especially in urban centres of Nigeria result in degraded urban environment and outbreak of disease such as cholera, diarrhea, etc. as it stands effective waste management in our urban centres need to be addressed to achieve sustainable development.

With regard to the study area, the classes of refuse generated include Ashes, Garbage, Rubbish, others are street waste and carcass (dead animals).

The per capita refuse generation rate in Nasarawa town is put at less than 0.1kg/day. The project identified three major disposal points which included within premises, refuse dumps and others. Most of the refuse generated are disposed by dumping at the river side and by burning.

The study have also shown that over 45% of the respondents indicated that improper disposal of refuse has health hazard and other negative consequences on the people and the environment.

The project have equally examined the importance of generated refuse which include reclamation of land, manure, animals feeding etc. lastly questionnaires have been used and the resulting data analysed.

## ACKNOWLEDGEMENT

I wish to sincerely thank the almighty Allah for given me guidance, protection and good health throughout the duration of this course and for bringing the journey to a possible end.

My special regard goes to my mother Rabi whose contribution to my moral up bringing cannot be quantifiable. To her I say may Allah reward and blessed you abundantly for your infinite contribution to the family.

May I also acknowledge the effort of Alhaji Jibrin, Alhaji Bala, Uncle Isa and Sa'id. To them all I say a big thank you. I do value the support and contribution of my colleagues and course mates like Abubakar, Shehu and Adamu.

My supervisor in person of Dr. Akiyeye, O. Shola thank you very much and may Allah reward you abundantly for your tireless effort and guidance throughout to the realisation of this project. I cannot forget to appreciate the contribution of all the lectures in Geography department especially the Dr. U.T Umoh, the coordinator of the programme Dr M.T Usman, Prof M. Baba, Prof. D.O Adefilale, Dr. A.P. Shola, Dr A.S Abubakar, Mrs A.E. Odafen etc.

Finally, I do value and appreciate the strong understanding and affection of my dear Fatima Umar throughout the duration of this course. I wouldn't forget to acknowledge my brothers and sister - Bala, Adamu, Buhari, Maimuna and Sahura. Thank you all and may Allah bless you all.

## DEDICATION

I am dedicating this project to Almighty Allah, my beloved mother (Rabi) and my late father Alhaji Abubakar Mohammed may his soul rest in perfect peace (Amin).

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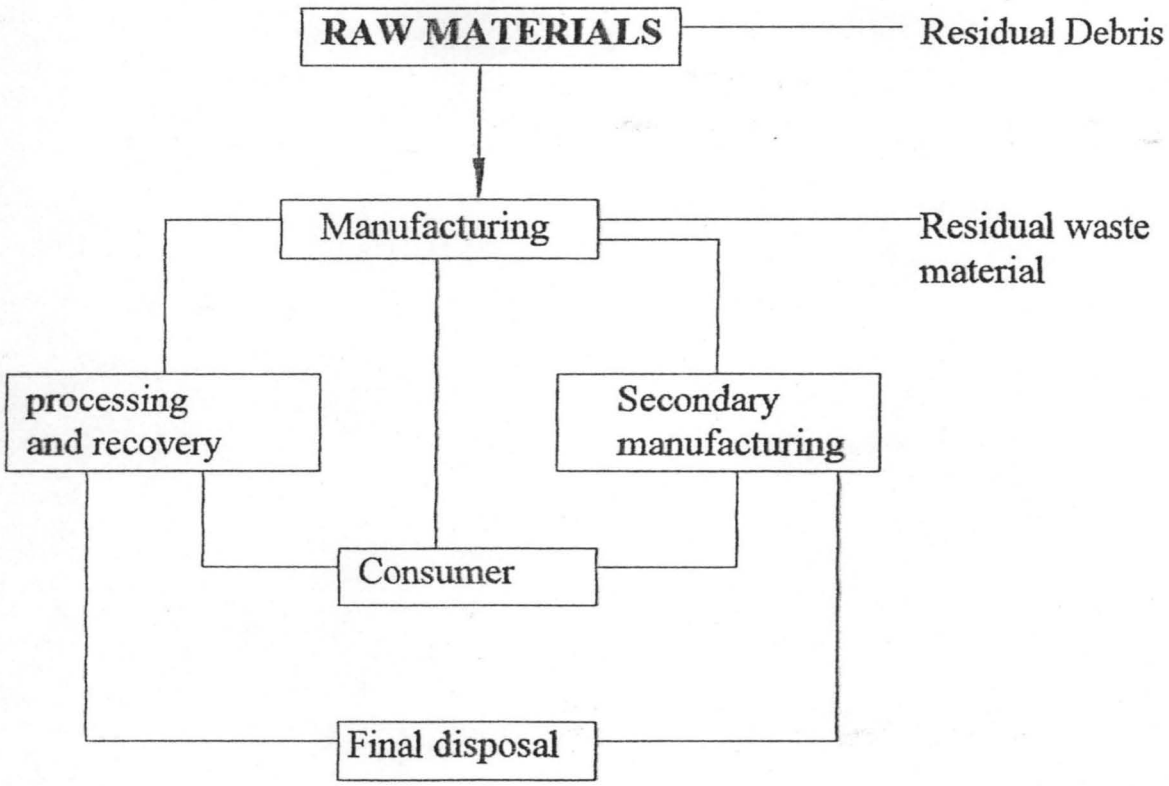
# CHAPTER ONE

## 1.1 INTRODUCATION

Solid waste products arise from our way of life. The mining of raw materials stage is the beginning of solid waste generation. Thereafter, solid wastes are generated at every step in the process as raw materials are converted to goods for consumption.

**MATERIALS FLOW AND THE GENERATION OF SOLID WASTES**




Solid waste management system consist of solid waste collection, disposal and resource recovery.

Refuse can be disposed off either as it is or after sustainable processing by using thermal or physical means of processing method. The major reason for processing refuse is for volume reduction and for some other reasons processing may serve to convert refuse to a more readily disposable form. As a result of low level of technology, lack of finance and high illiteracy in the developing countries,

open dumps are much in practice. And the processing method is thermal where open dumps are set on fire not minding the pollutional effect on the air environment.

The major aspects of refuse generation are examined. These include: sources of refuse in compounds, classes of refuse generated, as well as the storage in the study area. Please refer to plate 1 and 2 for example of open dumps within the study area.

PLATE 1

PLATE 2

EXAMPLE OF OPEN DUMPS WITHIN NASARAWA TOWN

## 1.2 WASTE MANAGEMENT DISPOSAL SYSTEM

Solid, liquid or gaseous disposal is seen as the final lapses of waste management. The effective waste management depends on how effective the stages are carried out. Different methods of waste disposal systems can be categorised into on-site and out-site disposal technique.

1. on – Site disposal-Here, home grinder, compactors and incineration operates like those of out – site disposal method. They are only suitable for small number of households are generally most succeptable to pollution because of the use of unskilled manpower. Also some methods are actually not a final disposal system. The highly notable waste disposal system include the following: Hoq feeding, open dumping, incineration, resources recovery, composting and pyrolysis.

### 1.2.1 HOG FEEDING

Hog feeding with waste is a form of resource recovery. In America, swine is fed with edible garbage, but with legislation that garbage should be processed before it is fed to swine. Most operators have stopped because it was found uneconomical due to the cost of materials for processing of the gabage. Hoq feeding is really constrained because it cannot be used for the disposal of the non-edibles which constitute a bulk of domestic/ industrial wastes.

### 1.2.2 OPEN DUMPING

This is highly practicable in developing countries. Open dumping is the cheapest form of waste disposal but is a source of a number of public health and safety problems such as diseases, air and water pollution, fire etc. it is not recommended

### 1.2.3 SANITARY LAND FILL

Sanitary land fill is a disposal method whereby refuse is placed in trenches, abandoned mines or quarry sites after the site has been properly designed. It is the most widely used system in both the developed and developing countries. Deposited waste are usually spread and covered with a required quantity of earth

materials which are also spread and compacted after each day tips (Wilson 1981). In other not to allow sanitary land fill to look an open dump, it needs to be strictly monitored scientifically in order to meet the criteria for eliminating or minimizing environmental nuisance such as odours, flies, fires, insects, wind blown litters etc. this includes the full utilization of available void space by good compaction of waste, minimization of problems of water pollution and gas generation and the re-use of the re-claimed land for specific purpose.

### 1.2.4 INCINERATION

Incineration is a method of disposing waste by a controlled combustion of combustible waste at a high temperature. Refuse from collection trunks is dumped on a changing floor or in a storage pit from where the refuse is transferred into the furnace in which temperature and draft are carefully controlled to assumed completed combustion. The ashes from the incineration need to be disposed into the land fill area. On the contrary the difficulty in the use in most developing countries is its high capital and operation costs, the need for highly skilled man-power and technology to effectively manage it and the possible air-pollution and fire hazard if not properly managed (Dechirra, 1975).

### 1.2.5. RESOURCE RECOVERY

Resource recovery is the process of turning what has been considered as waste into useful product for use. Wilson (1981) observed that we are going into the period of energy crisis and the possible way of remedying the situation is the process of converting what are considered waste and other sources of biomass to useful materials. In this regard, different method are employed resources recovery.

### 1.2.6 COMPOSITING

In composting refuse can be buried with or without light soil to produce humus that could be used as fertilizers, carbon dioxide, water and heat.

The standard compost practice is not carried out in developing countries. Even the developed countries that practice the method are gradually withdrawing

from the practice due to the disadvantage such as difficulties in separating the organic and inorganic materials, transporting the compost to farms and separating it is usually expensive and it can lead to offensive odours if not properly handle. This method is less expensive.

### 1.2.7 PYROYSIS

Pyrolysis though not practiced in developing countries is a technique of thermal decomposition of organic materials in the absence of oxygen and is seen as an alternative to incineration. The by-products of pyrolysis are organic and inorganic solid oil and gases that can be used as fuel and are marketable. Pylysis has advantages over incineration because it produces more energy than it consumes and it does not produce flies and slaps.

### 1.2.8 RECYCLING

Recycling of refuse and other waste is currently the most pursued method of waste id currently the most pursued method of waste disposal. The materials are sorted out before recycling can be carried out effectively. Transportation is a major factor in the realization of recycling, and can adversely affect the willingness of manufacturers to use the second grade raw materials if the cost is high. Wash materials like glass, paper, plastic-tyres etc can be recycled into such products. Okoli (1986) aptly stated. "...whilst the developed countries experiment at the desirability of refuse recycling and reclamation the practice is to a very high degree in the poorer parts of developing world..... not done as parts of any national disposal plan but scanvengers and beggers....."

## 1.3 STATEMENT OF PROBLEM

The volume of solid waste have assumed an alarming proportion that constituted a dam in most of our cities and local Government Headquarters thereby rendering the road almost inaccessible. Improper disposal of refuse has health hazard and other negative consequences on the people and the environment. Open refuse dumps in most parts of the country have become breading grounds for mosquitoes, flies rats and other diseases.

Above are some of the serious problems facing the study area. This project work will attempt to find a lasting solution to the problem.

## 1.4 AIMS AND OBJECTIVES.

To observe the challenges pose by the modern solid wastes disposal systems. Within this general aims, the specific objectives are:-

1. To identify the nature and composition of solid waste in the study area.
2. The project work intends to look at sources and different types of solid wastes within the study area.
3. Identify the consequences of improper disposal of refuse in the study area.
4. To suggest ways of controlling the problems.

## 1.5 JUSTIFICATION

The project work will attempt to identify the sources and nature of solid wastes and the modern management strategies. The study is expected to encourage serious research to trace the nature of health and other harzards resulting from the improper disposal of refuse by the common practice of open dumping more especially, research into alternative to polythene bags should be conducted. To create public enlightenment and improve public attitude to refuse management.

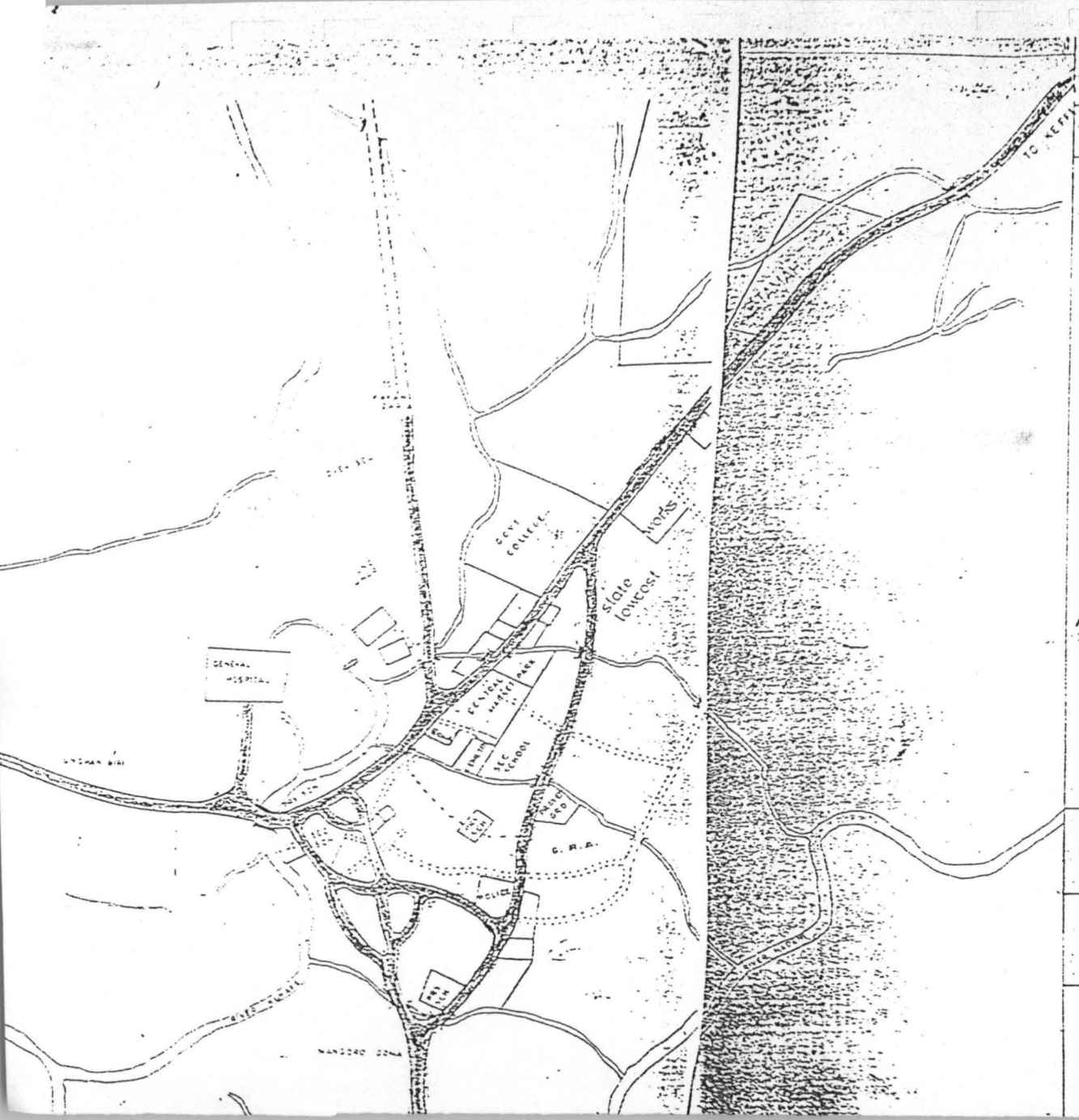
## 1.6 SCOPE

This project work seek to cover as much as possible the issues associated with refuse generation, collection and disposal within Nasarawa town. Included are sources and the effect of improper disposal of solid wastes to people and the environment.

## 1.7 STRUCTURE OF THESIS/PROJECT.

The project consist of six chapters, chapter 1 contain introduction, statement of problems, aims and objectives etc chapter 2 deals with study area while chapter 3 deals with literature review. Chapter 4 discuses methodology sources of data, population and sampling etc. chapter 5 is discussion of result/field work and

finally, chapter 6 sum up by findings, recommendations, conclusion and references. Thereafter comes the appendix.




## LEGEND

- UNTARED ROAD
- TARED ROAD
- RIVERS
- STREAMS
- COLLECTION POINTS
- DISPOSAL POINTS

SOURCE

NASARAWA MASTER PLAN

NAME
AHMED GAREA MOHA
PGD/99/2000/99

COURSE
POST GRADUATE DIPLOMA
ENVIRONMENTAL MANAGEMENT

SUPERVISOR
DR. P.S. AKINYEYE.
DEPARTMENT OF GEOGRAPHY
FEDERAL UNIVERSITY OF
TECHNOLOGY, MINNA

# CHAPTER TWO

## 2.1 HISTORICAL BACKGROUND OF THE STUDY AREA

According to sources in Nasarawa Local Government Council 2000 Nasarawa town was founded in 1835 by one the illustrious sons of the town called Makama Dogo. He was said to have migrated from Keffi emirate as a result of the dispute between him and Madaki Jibrin over the throne of Keffi.

The town (Nasrawa) is located in the South Eastern part of the present Nasarawa State, the name Nasarawa was called from Hausa word "Nasara" which means "victory", thus Nasarawa means "victorious people" hence the town got its name according to history after a victorious war.

Nasarawa town is a fairly developed area. Although at present there are no industries, yet their exist in the study area, commercial Banks such as United Bank for Africa (U.B.A), Peoples Bank of Nigeria and Nasarawa Community Bank. There exist in the area, Post office, NITEL to facilitate network from the area. Further, the town can boast of a good number of Primary institutions notable among which is the Central primary school, Nasarawa. There is also the presence of Secondary school such as Government College, Nasarawa (Ersthwhile known as Government Teachers College, Nasarawa), Community Secondary School, Nasarawa. The town also harbour a Post Secondary institution (Polytechnic) Federal Polytechnic, Nasarawa which enhances the town, Nasarawa State and indeed, the man power development and requirement of Nigeria as a whole.

The major roads in the study area are tarred and both pipe borne water and electricity supplied by Nasarawa State utility Board and NEPA Plc respectively are enjoyed in the town save for few occasions where their supplies are disrupted for technical reasons. The study area also has a good number of health care institutions owned by the government such as Comprehensive Health centre, Nasarawa and private Hospitals such as Alfa Hospital Henad Clinic to mention but a few. There is also the presence of Social Centres such as the Nasarawa Youth Centre etc.

mention must be made also of the presence of a police station which maintain law and order in the study area. Generally, the town can also be seen as a place where both petty and commercial trading is in vogue. This is apart from the market which is cited in the heart of Nasarawa to facilitate easy interaction of both buyers and sellers of both agricultural produce and finished goods.

There is no doubt of a reasonable development in the study area and their also evidence of the fact that the study area would continue to witness more development as a result of the coming of the polytechnic in the area.

## 2.2 CLIMATE

Nasarawa, like the rest of the West African sub-region has its climate influenced largely by two dominant air masses. These are the dry and dusty tropical continental air masses and the warm moist tropical moisture air masses. There is dynamism in the climatic condition which determines the nature of the rainfall regimes, the temperature and the wind.

### 2.2.1 TEMPERATURE

The highest temperature always tends to occur at the end of the dry season close to the spring equinox thus, March has the highest temperature of about 30oC the lowest temperature occur in the middle of the dry season in December/January with an average of about 25.5oC, when outgoing radiation is encourage by low humidity clear sky and longer nights. The lowest monthly mean temperature of the year occur in the middle of raining season (August) of about 26oC when daily minimal temperature are low.

### 2.2.2 RAINFALL

Nasarawa town experiences a marked seasonal rainfall as illustrated below.

i .A dry season without or with very little rain from November to March of about 95mm of all months.

ii A wet season from April to October the mean annual rainfall is 1,300mm.

iii The highest rainfall is recorded between the months of August - September exess rainfall could cause a lot of damages if solid waste are not properly managed.

### 2.2.3 Wind

International Tropical central zone (ITCZ), which represents the mixing frontier between the moist air from Atlantic ocean and the dry air from the Sahara desert.

These are the South – West mansons and the North-East trades winds respectively. In winter (from September to April) winds are North eastern bringing extreme aridity and harmattan. For the remaining months of the year, South, Western winds are prevailing. Generally the wind velocity is relatively low. A velocity exceeding 68 Km/h (average over a 10 minute interval) has only been recorded once during an 11 year period at Makurdi.

### 2.2.4 HUMIDITY

In the dry season, there is a decrease in relative humidity from South to North in Plateau State caused by the higher elevation in the North. In the raining season, the variations differ.

In Nasarawa town, the relative humidity show a marked decrease from the early morning to the afternoon throughout the year. For example, in the month of January, in the morning the relative humidity is 80% compared in the afternoon of about 30% throughout the year. The afternoon recorded of about 1600 h while in the morning it is 700h.

## 2.3. TOPOGRAPHY

The topography of Nasarawa town is made up of the gentle undulating terrain with serious of steep slopes to the wide Benue plain. This is because the town is located between the Benue valley and the Jos Plateau. The northern part of the Benue trough is characterised by lowlands which forms a continues plain about 100km wide which gradually slopes from the foot of the Plateau towards the slightly sleeper slopes descending from the foot of Plateau escarpment. South of the north lowlands follow the Benue river flood plains the western part of the

northern lowlands of Plateau where Nasarawa town is situated is in area of transition only parts of it can be regarded as belonging to the Benue plains. The northern half consist of a number of different landscapes. Its northern most section is a broken country of steep hills reaching elevation of up to 840km and narrow valleys. At the foot of these hills lies the Keffi plain at the elevation of 350 – 500m, the Southern half belongs to the Benue plain. It is generally somehow higher in the east and has generally somehow higher in the east and has sleeper slopes towards the river.

Nasarawa is situated between the rivers Hederi, (Alheri) and kurafi (river uke) which forms Eastern and western boarders of the town. The rivers have their confluence about 3km South-West of the town.

## 2.4. LAND USE

Majority of the indigenes of the study area (Nasarawa) are farmers while minor number of the indigenes engage in either commercial activities such as trading, handcrafts etc. others earn their living as civil servants, bankers, etc while majority of the non-indigenes of the area including those who earn their livelihood as civil servants.

The settlement which started with only a tent at a farm has expanded greatly and now experiencing tremendous growth in population and area coverage. Makama Dogo and Ahmadu Pakachi roads have always been a competitive area. Direction of growth also tends towards Tammah – Keffi road, Toto and Loko road. Moreover urban renewal is being affected gradually in Nasarawa core area by individual house owners community projects and users, and the Local government assistance to revamp the core area by providing good access, drainage refuse containers and a host of others determined programs and projects.

## 2.5 SOIL AND VEGETATION

The town is situated in the valley between the Benue river and Jos Plateau. The area is part of the south Guinea Savanna.

The vegetation has to a large extend resulted from extensive agricultural use of the land.

The prominent vegetation type is park savanna which is characterised by a discontinues canopy shades. Among the common trees are the oil bean trees, the sheabutter tress, the locust bean trees and the isober line trees. A large part of the vegetation is crops and pasture land. The most important crops are yams maize, sorghum, cassava, guinea -corn and cowpea etc.

## 2.6 POPULATION

According to 1991 national census figures the population of Nasarawa was estimated to be about 280,000 person and it is the main service centre of the rural district of approximately 20,000 person (Reference 1991 National Census) and its land mass according to the Local government council (2000) cover an area of 8, 154 sq km. It's approximately on8° East longitude and 8.5° North latitude. It is just a 25 minutes drive from Keffi which is approximately 38 Kilometers away.

# CHAPTER THREE

## 3.0 LITERATURE REVIEW

Over the past twenty years, Nigeria has witnessed rapid economic growth. As we all know, "growth does not appear everywhere at the same time; it manifest itself in point points or 'poles' of growth; with variable terminal effects for the economy as a whole" (Perroux, 1950). Certain regions of the nation therefore became better favoured than others so that as a consequence, there was tremendous urban growth with a shift in development from rural to urban areas. This growth in population has given rise to the raising mountains of garbage which now characterize most of our towns and cities. In the case of refuse, its collection and disposal have become the most glaring problem in our urban areas which have defined solutions by both military and the civilian administrators since Nigerians independence. In fact, this problem with its impacts on human life and property value in Nigeria has become increasingly worse and, to the critical observer, not much would seem to have been achieved in spite of huge investment of financial resources. Again the volume of waste generated by the populace in any city, town or village is directly related to the population density (Oqwuru, 1995; Ojikutu, 1994; Falomo, 1995) Lagos is a case in point where two –thirds of her gutters have become" open sesame: part dumping grounds part peeing and defecating places. Many gutters in Mahsin, Ajegunle, Idi-Araba to mention only notorious cases are not cleared for years (Osuji, 1994).

The mental attitude of our urban dwellers also constitutes a major constraint to the effective implementation of existing waste management polices of government. Falomo (1995) identified two broad categories of Nigeria urban populace on the basis of their mental attitude viz.

i The unconcerned elite who have an "out – of – sight out – mind" attitude towards piles of waste which they drive past on the streets en-route their offices.

ii The ignorant poor who have an attitude of helpless resignation to living with filth.

At the end, nobody does anything with regard to motivating the waste disposal authorities into action and the problem therefore lingers on part of wastes management in Nigeria urban areas are due to poor attitude exhibited by staff of the disposal authorities. Many people have often complain of having been compelled by law to remove waste from drain, gutters and from their general surroundings, only to find the pile still constituting an eyesore two weeks later, or until the next rainstorm washes the pile of rubbish back into the open drains. As a result, they have chosen to be altogether lawless in dodging the supposed compulsory sanitation exercise conducted once a month. This negligence on the part of government authorities is typified in the case of Lagos where in the 1980's three fancy giant incinerators where built and nobody seemed to know how to use them. The sites of these incinerators at Isolo and Oshodi, Oworonsoki have become traditional dump sites and no attempt is made for the further treatment of the wastes (Osuji, 1994, Falomo , 1995).

A disturbing matter about waste management problem is that its ineffectiveness is mostly impacted on the poorer urban, dwellers. While the affluent urban dwellers for instance are capable of insulating themselves from the hazards of the environment by creating their own sanitized and comfortable micro-environment, which include but not limited to, fully air conditioned home, clean, filtered and uninterrupted supply of drinking water, regular collections of refuse from their immediate surrounding, the poor masses are allowed to live and die in an environment which is the cause of their early death. Ojikutu (1994) showed the helpless estate of the poor when he likened their plight to the preface to George Bernard shows `major Babara' which says let him be poor ---------let his

habitations turn our cities into poisonous [illegible]
understanding become still less deserving".

## 3.1 URBAN WASTE MANAGEMENT BY ALL

The need for women involvement.

There is need for public participation in waste management i.e a total involvement of the ultimate generators of waste management process. As it is till today, the planing and technology for sanitation and waste management have been in the hands of men. This is far from being proper and fair since women constitute about 50 percent of the population of Nigeria (Sridhar 1996). The rational for women involvement can be seen from the following lines of reasoning.

1. At the household level, women take many decisions on domestic issues that affect the household, e.g water needs, farm produce, nutrition and health issues. They will therefore be in a better position to suggest the most appropriate technology and ways for handling various types of household wastes.
2. A good number or women (although more in the rural than in urban areas) serve purely as housewives i.e, they don't engage in any/other job than to attend 'home' environment year round, they should be more reliable caretakers of the environment.
3. Women, especially in recent times have proved to be good technicians in day to day maintenance of domestic appliances and equipments (Sridhar, 1996). They should not be left out in the field of waste management.
4. Leachate (water which has come into contact with wastes) pollute ground water and also affects food chain, health and human environment. Both women and children are victims of pollution infact, some 40,000 children die from diseases and other epidemics every day due to our bad waste disposal habits (Aina, 1995). There is therefore the need for effective involvement of women in waste management practices.

## 3.2 WASTE AS WEALTH

Waste do not mean useless or altogether worthless substances, as one waste Here may become a feedstock or raw material elsewhere. Piles of refuse in dump

sites especially in our urban centres are filled with plastics and other recycables. Little wonder than why they have been christened 'Scavangers' paradise (Osuji 1994). Each time, tens of these scavengers could be seen foraging the heaps and clamouring at every fresh truck load. Steps in the positive directions need to be taken to reconvert these wastes to wealth. To be able to achieve success in doing this, waste should be separated into their various components right from the generation stage.

Considering the chemical composition of various organic wastes, their value in nutrient levels places us at a vantage position in the consideration of composition as a waste management option. Some of the valuable waste and their nutrient levels are given below

**NUTRIENT VALUE OF VARIOUS ORGANIC WASTES**

| Waste | N | P | K | Ca | Mq |
|---|---|---|---|---|---|
| | (Kg available when applied at 1 ton per Ha | | | | |
| Refuse | 13.50 | 8.0 | 14.69 | 6.23 | 2.86 |
| Poultry | 21.80 | 11.2 | 6.0 | 6.2 | 2.4 |
| Piggery | 19.00 | 8.4 | 15.51 | 5.2 | 5.2 |
| Cattle | 13.33 | 3.31 | 22.4 | 10.0 | 5.51 |
| Horse | 14.40 | 2.80 | 4.31 | 8.6 | 2.51 |

Sources--(Adopted from women in waste management Py Sridhar, 1996)

For more efficiency in the conversion of our waste to wealth, the study recommend the privatisation of solid waste services. This is based on the results of the above data and the longstanding reputation of the private sector as progressive and innovative managers of service oriented enterprises (Falomo, 1995).

# CHAPTER FOUR

## 4.0 MTHODOLOGY

For the purpose of collecting information for this project work, the following methods of collecting information would be adopted.

A Oral interview /field work

B Researches from text books and relevant journals

C The use of questionnaire

## 4.1 SOURCES OF THE DATE

Data are collected from the responses from people who filled and returned their questionnaire forms, ground truth assessment and the oral interview conducted within Nasarawa town.

## 4.2 POPULATION AND SAMPLING

The questionnaires were distributed to people living in Nasarawa town using random sampling of the population with particular attention to Tammah area. The scattered populations were chosen because closer information need to be received on the situation of waste management in majority of the study area and Tammah accommodate most students admitted by Federal Polytechnic, Nasarawa. (A sample of the Questionnaire is shown in 31 Appendix).

## 4.3 DATA ANALYSIS

The data collected were analysed through the use of percentages and tables.

The data from the questionnaires will be tabulated.

The data will then be used for various discussion on the result

## 5.0 DISCUSSION OF RESULT

A total of 50 questionnaires were sent out to respondents and 34 completed questionnaires were returned, representing 68% of the total number of questionnaires sent out. The responses are as follows:- Question 1: Which of the following wastes are more generated in your house?

Table 5.1: **RESPONSE AND ALSO REFER TO PLATE 3 AND 4 FOR PICTURE REFERENCE.**

| RESPONSE | FIGURE | PERCENTAGE |
|---|---|---|
| Farm Products | 3.5 | 7% |
| Food Particles | 26.5 | 53% |
| Others | 20 | 40% |
| **Total** | **50** | **100%** |

**Sources: Complied by the author**

The study identified three different sources of refuse generation in the study area. These are cooking, farm products and others such as combination of cooking and farm products, or plastics, polythene bags e.t.c from this results. It was deduced that 53% of the respondents generate their refuse from cooking while only 7% from farm products and 40% is from other sources. This suggests that cooking is the major source of refuse in compounds of the study area. This might not be unconnected with the fact that one cannot survive without eating food and in the process remnants of food are generated as refuse.

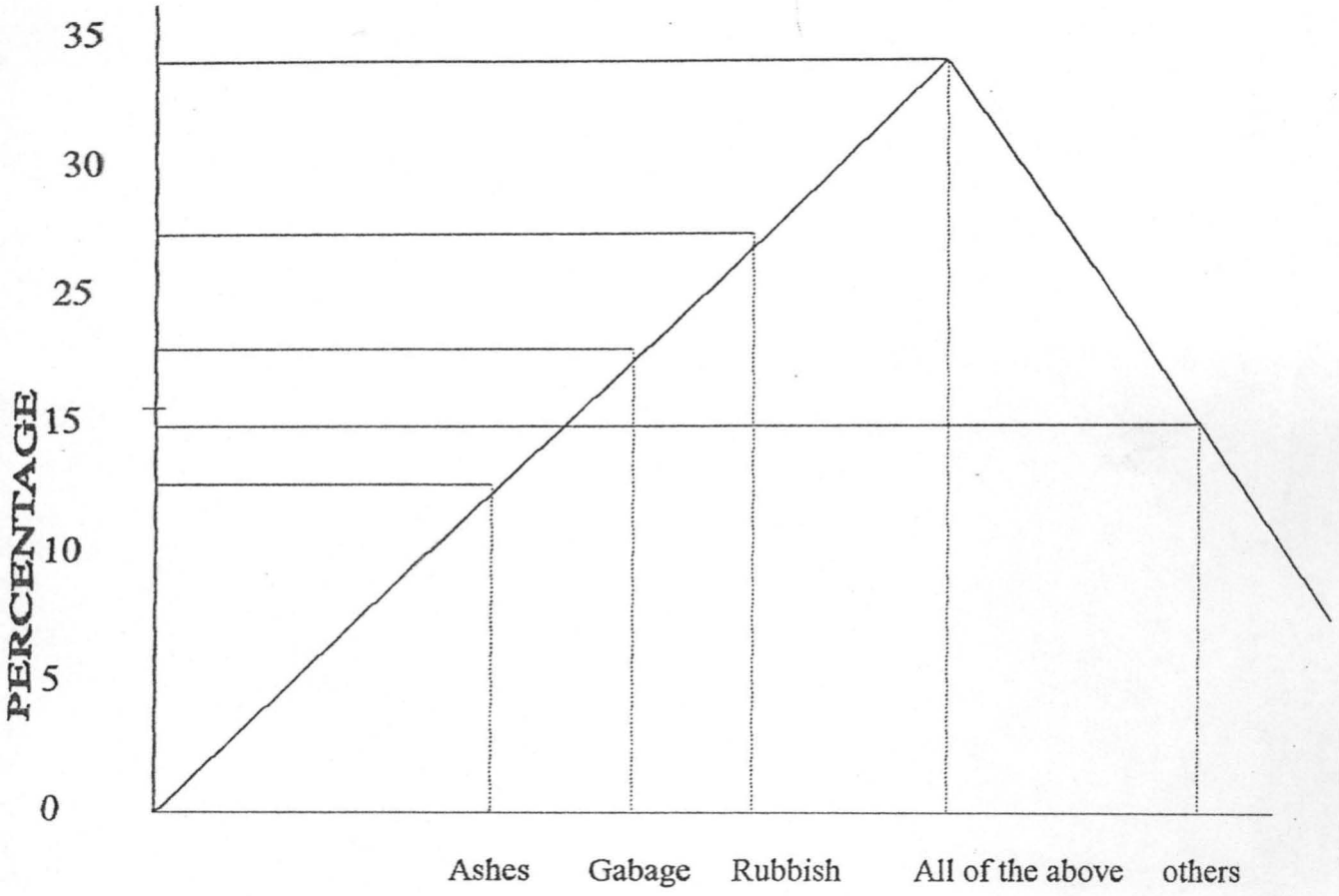
### CLASSES OF REFUSE GENERATED

For easy identification refuse generated in Nasarawa town are classified into Ashes, Garbage, Rubbish and others. **TABLE 5.2**

| CLASSES OF REFUSE | FREQUENCY | PERCENTAGE |
|---|---|---|

| | | |
|---|---|---|
| 1. Ashes | 7 | |
| 2. Garbage | 10 | 16.39% |
| 3. Rubbish | 15 | 24.59% |
| 4. All of the above | 20 | 32.79% |
| 5. Others | 9 | 14.75% |
| **Total** | **61** | **100%** |

Source: Field work 2000




**CLASSES OF REFUSE GENERATED**

From the table 5.2 and the graph above, it can be observed that only 11.48% of the respondents generate their refuse from Ashes, only 16.39% from Garbage, 24.59% from rubbish only. In all 32.79% generate their refuse from all the for categories of refuse mentioned above, other types of refuse (which could be a combination of any two or more of the four types) account for 14.75%. And discussion with an official of Nasarawa Local Government Council, Health

Department indicate that apart from the classes of refuse mentioned above, classes of refuse generated include street wastes such as leaves, papers etc and carcass (dead animals). However, carcass constitute negligible percentage. It was also observed that dumped refuse provide a breeding place for dangerous insects and rats which transmit various diseases.

**QUESTION 2:** How do you handle household wastes?

Table 5.3

| RESPONSE | FIGURE | PERCENTAGE |
|---|---|---|
| By throwing them away | 43 | 86% |
| By Storing them in dustbins | 7 | 14% |

**Sources: Compiled by the author**

Waste generated from Nasarawa town are largely thrown away instead of being stored before removal. About 86% of the total waste generated are simply thrown away. This also indicates that the use of dustbins is not in practice only 14% of the respondents store their Wastes before they are called for disposal.

**QUESTION 3** How regular are wastes removed from dumping sites?

**Table 5.4 REFER TO PLATE 5 FOR PICTURE REFERENCE.**

| RESPONSE | FIGURE | PERCENTAGE |
|---|---|---|
| Immediately wastes are dump | 0 | 0% |
| Not removed at all | 49 | 98% |
| Removed after several weeks | 1 | 2% |

**Sources: Compiled by the author**

**Table 5.4** above indicates that the bulk of wastes dumped at the various site with most of it dumped by the river side are left unattended which shows 98%. And obviously waste removal is not in practice.

**QUESTION 4:** When do you observe wastes increase so in ...

**Table 5.6**

| RESPONSE | FIGURE | PERCENTAGE |
|---|---|---|
| Rainy season | 35 | 70% |
| Dry season | 15 | 30% |

**Sources: Compiled by the author**

Of the whole wastes generated within the study area 70% is in the reason. This night not be unconnected with the additional agricultural wastes that are abundant during the period. Whilst only 30% is generated during the dry season.

**QUESTION 5**: People do not use dustbin due to

**Table 5.7**

| RESPONSE | FIGURE | PERCENTAGE |
|---|---|---|
| Poverty | 20 | 33.33% |
| Ignorance | 6.5 | 10.8% |
| Not provided by government | 33.5 | 60% |

**Sources: Compiled by the author**

Majority of the people in Nasarawa town constituting about 6o% of the respondents have indicated that people do not use dustbin because they not provided by the government this is followed by 33.33% of the respondents who attribute the lack of usage of dustbin due to poverty. The remaining 10.8% attribute it to ignorance.

**QUESTION 6:** people can assist in proper waste management by:-

**Table 5.8**

| RESPONSE | FIGURE | PERCENTAGE |
|---|---|---|
| Throwing the waste everywhere | 13 | 26% |
| Storing dustbins | 37 | 74% |

**Sources: Compiled by the author**

About 74% of the respondents have shown that the use of dustbins is the best way to help in waste management. About 26% of the respondents however indicate that

throwing the wastes is the best way to deal with solid wastes.

majority of people will use the dustbins if provided by the government or if they can afford to provide for themselves dustbin that can be regularly evacuated.

**QUESTION 7:** How can the government improve waste management?

**Table 5.9**

| RESPONSE | FIGURE | PERCENTAGE |
|---|---|---|
| Early removal of wastes | 25 | 50% |
| Increasing public awareness | 25 | 50% |

**Sources: Compiled by the author**

Table 5.9 above indicates that about 50% of the respondent in the study area have indicated that government can improve the waste management by quick removal of solid waster from the dumping sites this has shown the level of disturbance heaps of refuse constitutes to the people in the study area. The other 50% response means that people do not see public awareness as important as immediate removal of waste from dumping sites.

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

**Table 5.10**

| RESPONSE | FIGURE | PERCENTAGE |
|---|---|---|
| Burning | 13 | 20% |
| Dumping into the bush | 22 | 33.85% |
| Dumping into the river | 30 | 47% |

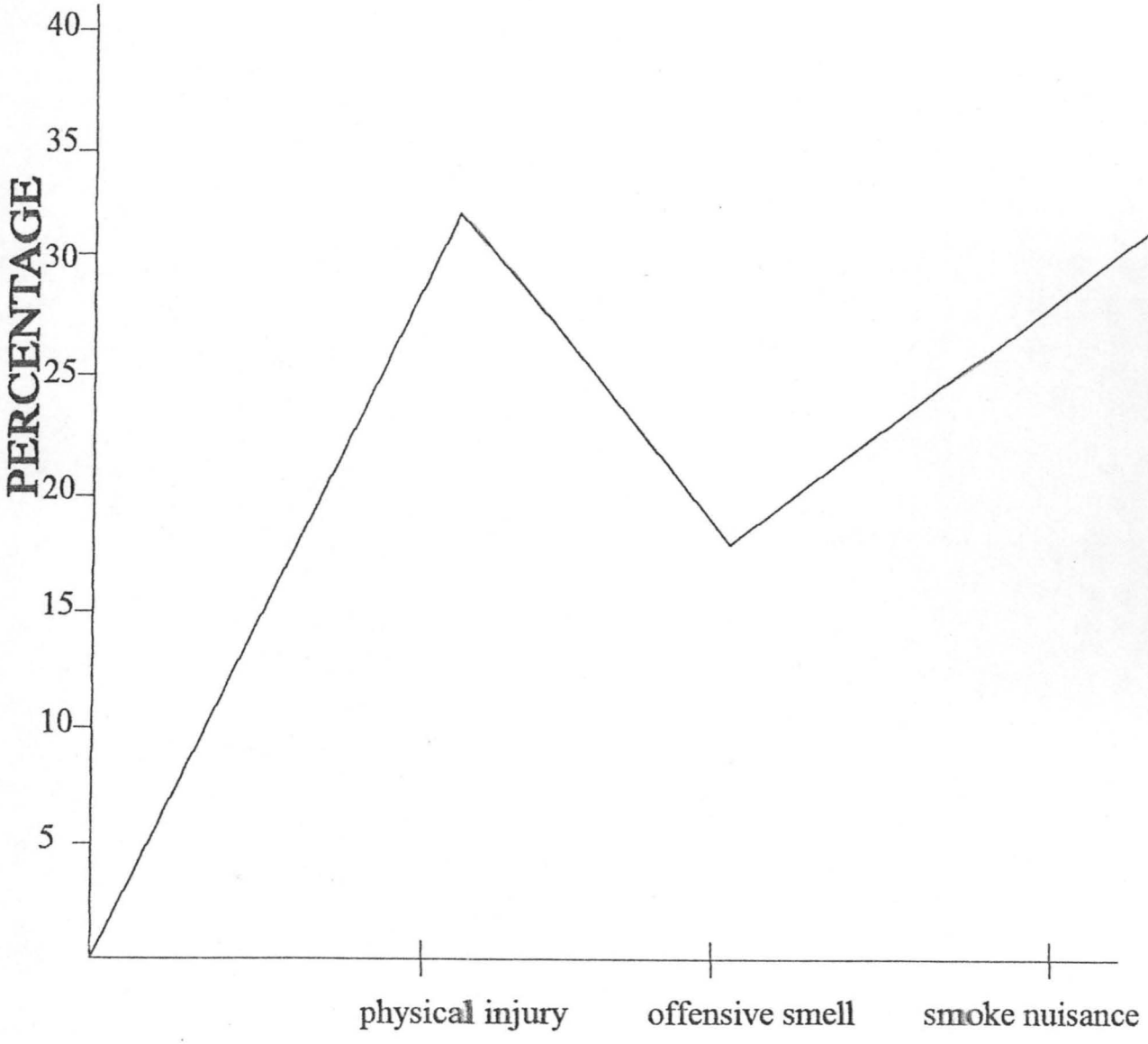
**Sources: Compiled by the author**

About 33.85% of the respondents in table 5.10 above have indicated that dumping the solid waste into the bush is the best way 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. And even more people 47% want the solid wastes dispose off in the river as a way of getting rid of it. While just 20% opted for burning.

**QUESTION 9** which of the following hazards is more disturbing at dump sites?

**Table 5.11**

| RESPONSE | FIGURE | PERCENTAGE |
|---|---|---|
| Physical injury | 22 | 37% |
| Offensive smell | 14 | 23% |
| Smoke nuisance | 24 | 40% |



## RESPONSE

In table 5.11 and the graph above 40% of the respondents believed that smoke nuisance at dumping sector is more injurious this is because every household near dumping sites are uncomfortable due to the smoke nuisance 23% of the respondents are of the view that offensive smell from the dumping sites is more disturbing while 37% which is fairly large number only decide on physical injury to be the most disturbing hazard at dumping sites.

**Sources: Compiled by the author**

**QUESTION 10**. Which of the following is more disturbing effect of smoke nuisance.

**Table 5.12**

| RESPONSE | FIGURE | PERCENTAGE |
|---|---|---|
| Reduce visibility | 6 | 16.2% |
| Breathing difficulty | 7 | 18.9% |
| Eye irritation | 24 | 64.8% |

**Sources: Compiled by the author**

The largest number of respondents constituting 64.8% see eye irritation to be the most disturbing effects of smoke nuisance from dumping site. Breathing difficulty comes next with 18.9% of the respondents in support while reduced visibility comes last as the most disturbing effect of smoke nuisance and supported by 16.2% of the respondents.

**QUESTION 11**: Which of the following acts causes the blockage of drainage.

**Table 5.13**

| RESPONSE | FIGURE | PERCENTAGE |
|---|---|---|
| Solid wastes filling into drainage from dumping sites | 4.5 | 12.2% |
| Wind blowing wastes into drainage | 9.5 | 25.7% |
| People directly dumping wastes into drainage | 23 | 62.2% |

**Sources: Compiled by the author**

62.2% of the respondents in table 5.13 believed that drainage in Nassarawa was blocked by refuse directly thrown into them by the people while 25.7% believe that the waste in drainage are blown in by the agent of wind. Only 122% of respondents see the blockage to be due to direct filling of wastes into the drainage from dumping sites thereby resulting in blockage.

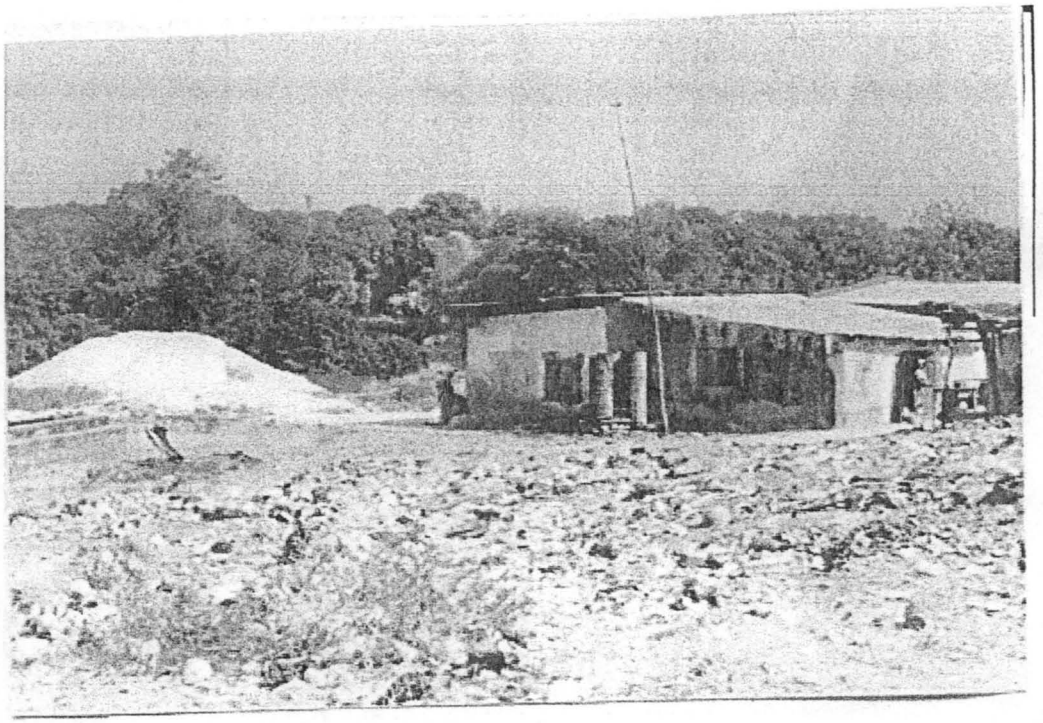


PLATE 3

SHOWING WASTE FROM A RICE MILL IN THE STUDY AREA.

PLATE 4

INDICATING WASTES FROM POLYTHENE BAGS AND OTHER WASTES PRODUCTS.

PLATE 5

REFUSE DUMPED AT THE RIVER SIDE UNATTENDED.

**QUESTION 12** . Which of the following may happen due to the blockage of the drainage?

**Table 5.14**

| RESPONSE | FIGURE | PERCENTAGE |
|---|---|---|
| Offensive smell | 14.5 | 29% |
| Floading of surrounding areas | 35.5 | 71% |

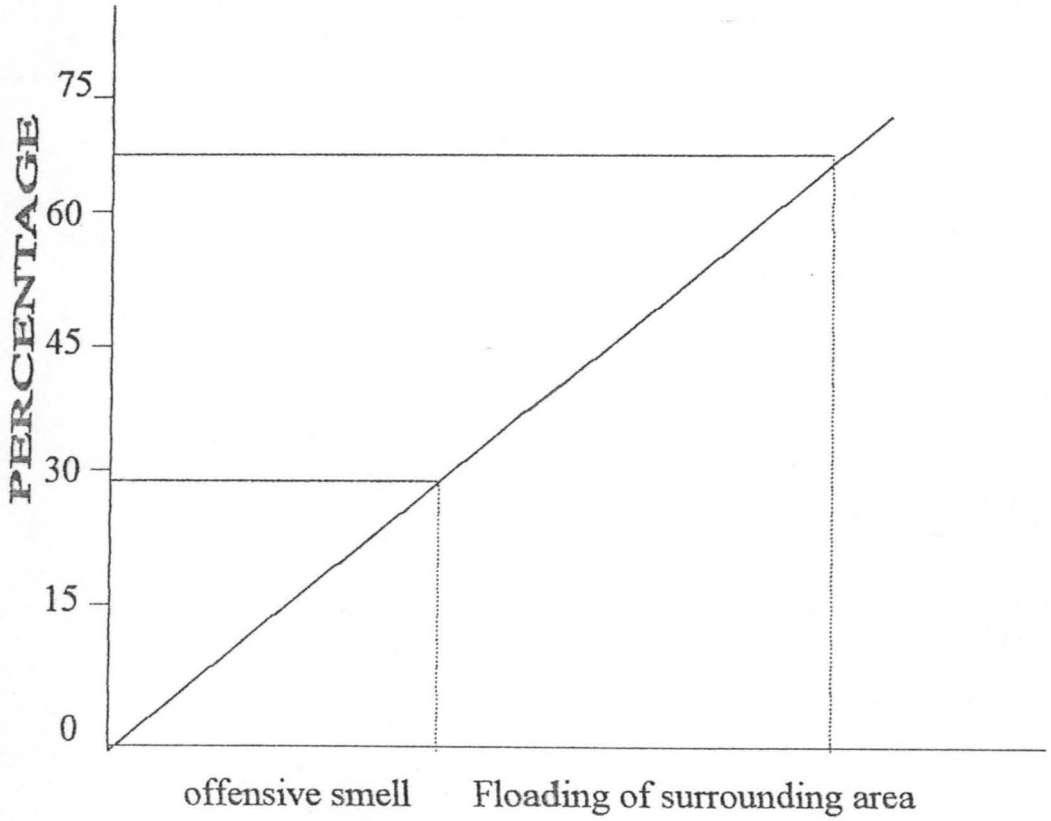



Table 5.14 and the graph indicated that 14.5 respondents said there will be offensive smell as a result of solid waste blockage whilst 35.5% which constitute more of the people decided in floading as a consequences of refuse blocking the drainage.

**Sources: Compiled by the author**

# CHAPTER SIX

## 6.0 FINDINGS

The effect of improper disposal of refuse on people and the environment generally has long been recognised. In this study over 45% of this respondents indicates that improper disposal of refuse has health hazard and other negative consequences in the people and the environment.

Open refuse dumps in most pasts of the study area have becomes breeding grounds for mosquitoes, flies, rats and other disease. Some of the major effects of refuse include the following:

**ODOUR:-** This arises as a result of combination of rotten vegetable and other refuse that are indiscriminately discarded. When this situation persist all day and night, it constitute a major environmental nuisance. Some passer by and indeed people living around such environment do find this unattractive, others consider it a revolting stink.

**INSECT AND RATS:** Refuse dump also attract both insects and rats which are dangerous and can transmit various diseases using refuse dump as their breeding ground. Disease such as dysentery, diarrhea and a host of others are largely brought by insects while plague, typhus, leptispirosis, histoplasmosis, rat bit fever, and many other diseases are the products of rats, yet at they destroy almost everything that they get access to including furniture and foodstuff. (field work)

**ATMOSPHERIC POLLUTION**- When refuse is burnt in the open place, a pull of dense black smoke often covers the site and neighbouring land so that its position can be located from a distance. Table 5.11 and 5.12 also indicated that the smoke nuisance is more hazardous at the sites and often causes irritation. Apart from particular matter that constitute smoke gaseous discharges from incomplete combustion may include sulphur dioxide (So2) nitrous oxide and various other noxious which are dangerous to health.

Pollution of water resources is also another inherent character of disposal of refuse

in open area.

**ENVIROMENTAL DEGRADATION:-** Huge dumps of refuse and indiscriminate manner in which people tip refuse has become eyesores to member of public. It destroys the scener of the environment. It also becomes a source of psychological disorder.

If tourism is an important revenue base to the economy, such aesthetic nuisance may reduce the number of visitors with resultant economic loss. Increase of flies and rats and wind blown dust, paper polythene bags and plastics are all harmful to the locality.

Furthermore, the project work have shown that dust bins are not in use (see table 5.3) neither by the house holds or centrally by the community. This reason contributes to the general filthy condition of the study area. If all wasters are carefully stored in dustbins whether household or community based and the waste are subsequently collected and disposed off solid wastes will not have littered everywhere as it is now. Apart from the reason given in (table 5.7) 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.

It is worthy of note that, although one may under wheather refuse has got any important because of its nature. It is significant to note that some people depend on refuse as their source of income. Refuse is important for among others reclamation of land, source of manure, animals feeding, it is also recycled for usage.

## 6.1 RECOMMENDATIONS

In order to ensure an effective waste management and basic sanitation in urban cities and rural areas in Nigeria, a separate department to be called environmental safety Department need to be created whose responsibility is to educate both the public and health or sanitary inspectors on how to dump wastes and the appropriate method in disposing them. Secondly these departments at local and State levels should always organize lectures, symposium etc to the sanitary

...ow to ensure adequate safety while on duty. Added to these, weekly or monthly magazine entitle "you and your waste" should be launched by the three iers of government and interpreted at different ethnic languages in Nigeria. This vill guide the public and the sanitary workers on how to dump and collect or ispose wastes respectively.

Moreover, the period for refuse collection must be change. Instead of the sual morning afternoon and evening time, night period is recommended. This will revent traffic jam caused by the refuse collection vehicles in Nigerian towns and ities. Other recommendations are:-

Government should put more effort on sanitation activities by:-

a) Providing enough founds to the local government Health Department saddle with the responsibility of refuse collection and disposal with general sanitation, for purchase of working materials and staff welfare.

b) Ensuring that sanitation should not necessarily be on sanitation days alone but always.

Introduction of reward to the cleanest wards.

Encouragement of NGO's to participate actively in sanitation activities.

Government should look into the possibility of establishing a polythene bags ycling plant to take care of the growing number of polythene bags ring the streets and dumps.

serious research is needed to trace the nature of health and other resulting from the improper disposal of refuse by the common of open dumping more especially, research into alternative to ags should be conducted.

ould be intensified by both government and non-governmental creating the environment protection awareness level of this l help change the culture of in sanitary leveling in many

ld be mobilized and channeled towards the recycling

and reuse of recyclable waste item. It therefore also mean that the public need to be educated to separate wastes into their various components right from the point of generation.

## 6.2 CONCLUSION

In order to maintain good and healthy environment in Nigeria cities and rural areas, The Federal, State and Local Government should ensure that refuse generated are properly dispose off by the sanitary workers. Also the above recommendations are complementary to other peoples recommendations.

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## APPENDIX

## QUESTIONNAIR ON SOLD WASTES MANAGEMENT IN NASARAWA TOWN.

Dear Sir/Madam,

The questionnaire is designed to obtain some information on the solid wastes management in Nasarawa town. You are to answer the questionnaire below. I wish to assure you that this is simply an academic exercise and all information given will be treated confidentially.

You are to tick the correct answer from following question:-

1. Which of the following wastes are more generated in your house?
A Farm product
B food particles
C Others

2. How do you handle household waste?
A by throwing them away
B by storing them in dustbins

3. How regular are waste removed from dumping sites?
A Immediately wastes are deposited
B Not removed at all
C Remove after several weeks

4. When do you observe wastes increase in Nasarawa.
A During rainy season
B during dry season

5. people can assist in proper waste management by
A Poverty
B Ignorance
C The are not provided by government

6 People can assist in proper waste management by
A Throwing the waste anywhere
B Storing in dustbins.

7. The government can improve waste management by
A Early removal of waste
B Increasing public awareness

8 Which is the best way to dispose off solid wastes?
A Burning
B Dumping into the bush
C Dumping into the river

9 Which of the following hazard is more disturbing at dumping sites?
A Physical in injury
B Offensive smell
C Smoke nuisance

10 Which of the following is more disturbing effect of smoke nuaisance
A Solid wastes falling into drainage
B Wind blowing waste into drainage
C people directly dumping waste into drainage

11 Which of the following acts causes the blockage of drainage:
A Solid wastes falling into drainage from dumping sites.
B Wind blowing wastes into drainage
C people directly dumping wastes into drainage

12 which of the following may happen due to the blockage of the drainage?
A Offensive smell
B Flooding of surrounding areas