A STUDY OF HEALTH HAZARDS ASSOCIATED WITH REFUSE DUMPING IN LIMAWA WARD A (IMPLICATIONS AND REMEDIES)

BY

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DECLARATION

I HEREBY DECLARE THAT THIS WORK IS WHOLLY THAT OF THE AUTHOR CONDUCTED UNDER THE SUPERVISION OF DR. AKINYEYE P. SHOLA ALL SOURCES OF INFORMATION USED IN THE REVIEW OR IN SUPPORT OF MY ARGUMENTS ARE SPECIFICALLY ACKNOWLEDGED BY MEANS OF REFERENCES.

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SIGNATURE _____

DATE 20/12/2004

CERTIFICATION

This is to certified that a study of Health hazards associated with refuse dumping in Limawa Ward "A" (Implications and remedies) was carried out by me and presented to the Department of Geography, Federal University of Technology, Minna. In partial fulfillment of the requirement for the award of postgraduate Diploma in Environmental Management.

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DEDICATION

This project is dedicated to my wife Salamatu Kolo, and our daughter Aisha Y. Madaki.

ACKNOWLEDGEMENT

I thank the Almighty Allah, the most merciful and most beneficent for making it possible for me to successfully complete this Post Graduate Diploma Programme.

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ABSTRACT

Lack of initial urban design and consideration for establishment of appropriate dump site outside a residential area are resulting in to environmental pollution. Inadequate urban infrastructures are adding to the mental and social tensions polluting the environment. An efficient system of refuse disposal is one of the most important factor for solving human health problem and the environmental deterioration in human settlement.

The study employed the use of prepared questionnaire, personal interview, physical observation of the study area and laboratory analysis of the well water around the waste dump site. However the purpose of this study is to draw attention and suggest solutions to these problems of health hazards associated with indiscriminate dumping of refuse within a residential area.

And for the above given reasons the study concludes, that common disease like diarrhea and vomiting, typhoid fever, desentry, malaria and skin infection are prevalent in Limawa ward due to filtty and dirty environment as a result of open dumping of refuse in Limawa ward.

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CHAPTER ONE

1.1 INTRODUCTION

Nigeria, like most developing Countries is currently facing a high risk of various diseases out break like cholera, typhoid Malaria etc and other health hazards due to environmental pollution cause by refuse dumping within a residential areas. And in spite of the interest in various aspects of contemporary urban Development in Nigeria and throughout the Tropical Africa, little or no attention has been paid to the study and analysis of the health hazards associated with environmental pollution due to refuse dumping in residential areas.

Lack of environmental sanitation has been a feature common to all Nigerian settlements. This assertion is already attested by Newspapers, radio programme and of course findings emanating from systematic research. This various but closely related facets of environmental squalor include conservancy services, drainages, water supply, wastes disposal and all kinds of pollution. Whilst these are problems demanding public and private attention. The magnitude of solid wastes collection and disposal in residential areas at the moment seems to be increasing at a high rate, because the situation has tended to worsen with increasing

population, urban and Economic growth; These trend if allowed to persist unchecked for a long time, will have a devastating effect on human health.

The protection and improvement of the Human Environment is a major issue, which affects the well being of people and economic development throughout the world. It is urgent desire of the people of the world and the duty of all government, and if man's capacity to transform his surroundings is being used wisely, it can bring the benefit of development and the opportunity to enhance the quality of life.

It is easy to become an alarmist about the growing magnitude of the environmental crisis and its likely results. Every land that is used as refuse dump site, surrounding boreholes, wells, streams and Atmosphere are polluted by growing wastes from homes, restaurants etc.

With pollution, the price and scarcity of potable water goes up in Nigeria town. The problems of solid wastes are directly proportional to the number of people in each community. in places where refuse depots are provided, wastes litter the neighbourhood and actions of domestic chickens, goats, cows and dogs add further to the problem.

Apart from that situation around the public depots, various forms of other domestic and commercial wastes are found in street, streams and around residences. In some case, the facades of some residential structure are being used as a depot for wastes disposal against the wish of the occupants. Upon all the physical environmental problems confronting the state capital (Minna), refuse collection and disposal is one that ought not to exist since land and relatively cheap labour are still available. The only aspect of refuse collection which apparently should worry the urban development board in the state is the lack of vehicles, equipment and fund.

The fund allocated for refuse collection disposal by the state government are seriously inadequate. The above points contributed to the failure of the people to adopt the right attitude towards garbage disposal and to join the efforts of having their refuse regularly collected instead of throwing it around their residences indiscriminately.

The foregoing discussions of the characteristics of solid wastes collections, conveyances and disposal as well as the declining environmental quality of Limawa Ward in Minna, the state capital and the attendant health effects, suggest that effective polices should be devised to improve the existing systems.

However environmental problems of this nature require a combination of strategies or alternatives, since no single approach can solve all the problems.

And if the physical mental well being of all the citizens is tied to social – economic development of any nation, than quick or timely intervention by all the three tires of government, Environmental Health Inspectors, Scientist, Environmentalist, Academician, private organization and individuals can not be over emphasize.

1.2 STATEMENT OF PROBLEMS

It has been well established that the environmental problems, such as land pollution, air pollution, water pollution and floods etc. are threat to life and safely to all earthly living organisms. Everyone wishes to live in a pollution free environment, but nobody seems to care about the danger especially health hazards, environmental pollution may cause as a result of indiscriminate dumping of refuse within a residential area. The amount of domestic refuse will obviously increase as the town grows and the prosperity of pollution rises.

This has become acceptable attribute of some towns and cities like Lagos, Ibadan and Kano just to mention a few. The city

inhabitants help tremendously in the contribution of refuse heaps in towns. In some cases open spaces, gutters, streets, house frontage etc have won clear victories for refused dump whereby contributing to the environmental squalor. This does not only cause the physical damage but also contribute to health hazards. And if we all realize this, then, we will know that it is our duty to keep our towns tidy, so as to avoid possible disease outbreak such as cholera, malaria typhoid etc and other health hazards.

1.3 AIMS AND OBJECTIVE

AIM

- To examine and analyse the diseases and other related health hazards

OBJECTIVE

(i) To examine and determined the types of possible diseases and other health hazard in the study area.

(ii) To analyse the extend of environmental pollution in the study area.

(iii) To suggest a proper and more suitable method of refuse disposal.

(iv) To create awareness to the general public on the danger of open refuse dump in a residential area.

1.4 JUSTIFICATION

Effective system of refused disposal is one of the most important factors for solving human heath problem and environmental deterioration in human settlement. The prevailing situation in most Nigerian towns and cities as regard these services are still quite unsatisfactory. Streets are frequently littered with garbage because of the inability of township authorities to organise regular collection and disposal. Lack of awareness on the part of inhabitants on the danger of open refuse disposal within a residential area is another serious problem that need urgent attention of all the stakeholders.

In the light of the foregoing, this study is to draw attention and suggest solution to the problems and health implications of open refuse disposal in Limawa Ward.

1.5 SCOPE AND LIMITATION

The study shall be limited to determination and analyses of possible disease and other health hazards in the study area. And the extend of environmental pollution will also be examine and analysed in the study area.

Finally, the local and state government environmental health services has no detailed and sound up – to date statistical data on this subject matter.

1.6 LOCATION AND CLIMATE

Niger State lies on latitude 3^{0}.20' East and longitude 11^{0}.3' North. It is boarded to the North by Zamfara State, Northwest by Kebbi State, South by Kogi State and Southwest by Kwara State, Kaduna and Federal Capital Territory border the state to both Northeast and Southeast respectively. The state has a common boundary with the Republic of Benin along New – Bussa, Agwara and Wushishi local government areas.

Niger State was created on February, 1976, from the defunct North – Western state by the Late Head of State General Murtala Ramat Mohammed. The state however came into being on 1st April, the same year. At the inception of the state administration in 1976, there were only eight (8) local government area thus; Chanchaga, Rafi, Gbako, Etswan, Abuja, Mariga, Magama and Lavun local government areas. Etswan local government area comprising of Agaie and Lapai was splited into two and that action gave birth to both Agaie and Lapai having their respective local government area.

During the 1979 – 83 civilian regime, more local government were created under the administration of Alhaji Mohammed Awwal Ibrahim. The local governments are as follows: Kuta, Paikoro, Chanchaga, Rafi, Kagara, Gbako, Katcha, Lemu, Lapai, Agaie, Suleja, Mariga, Bangi, Magama, Auna, Lavun, Mokwa and Jima – Doko local government area.

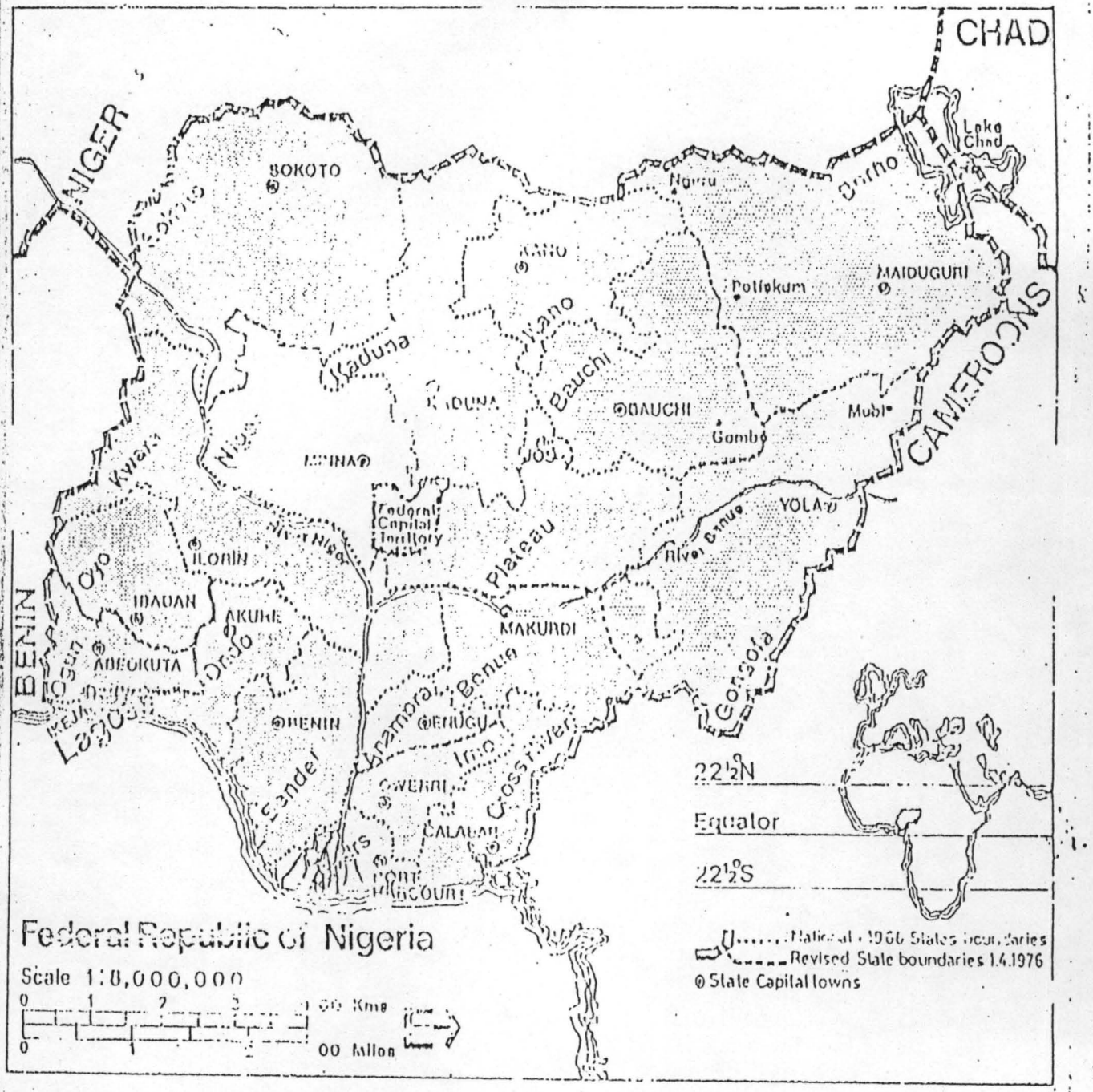
At the inception of the military regime in 1984, however, all the newly created local governments in the state and the federation at large, were dissolved and old local governments structure reverted. Chanchaga local government was splitted into too, giving birth to Minna municipal council with headquarters at Minna while Kuta remained the headquarters of Chanchaga local government. In 1987 however, Minna municipal council was renamed Chanchaga local government and the former Chanchaga Local government was renamed Shiroro with Kuta being returned as Headquarters of the local government.

In 1991, General Ibrahim Badamasi Babangida created Nine states and more local government in the country. This action gave birth to nine additional local governments in the state bringing the total to 19. Also, in 1996 Late General Sani Abacha, created additional six states and one hundred and eighty–two local

government. Six additional local government were created in the state bringing the total to 25.

As at 26th of August 1991 i.e. before the emergence of Borgu and Agwara LGA, the state covers a land area of 74, 244 square kilometers (7,424, 400 million hectares) covering 8% of the total land area of the country. With the merger, the land area is approaching 8 million hectares.

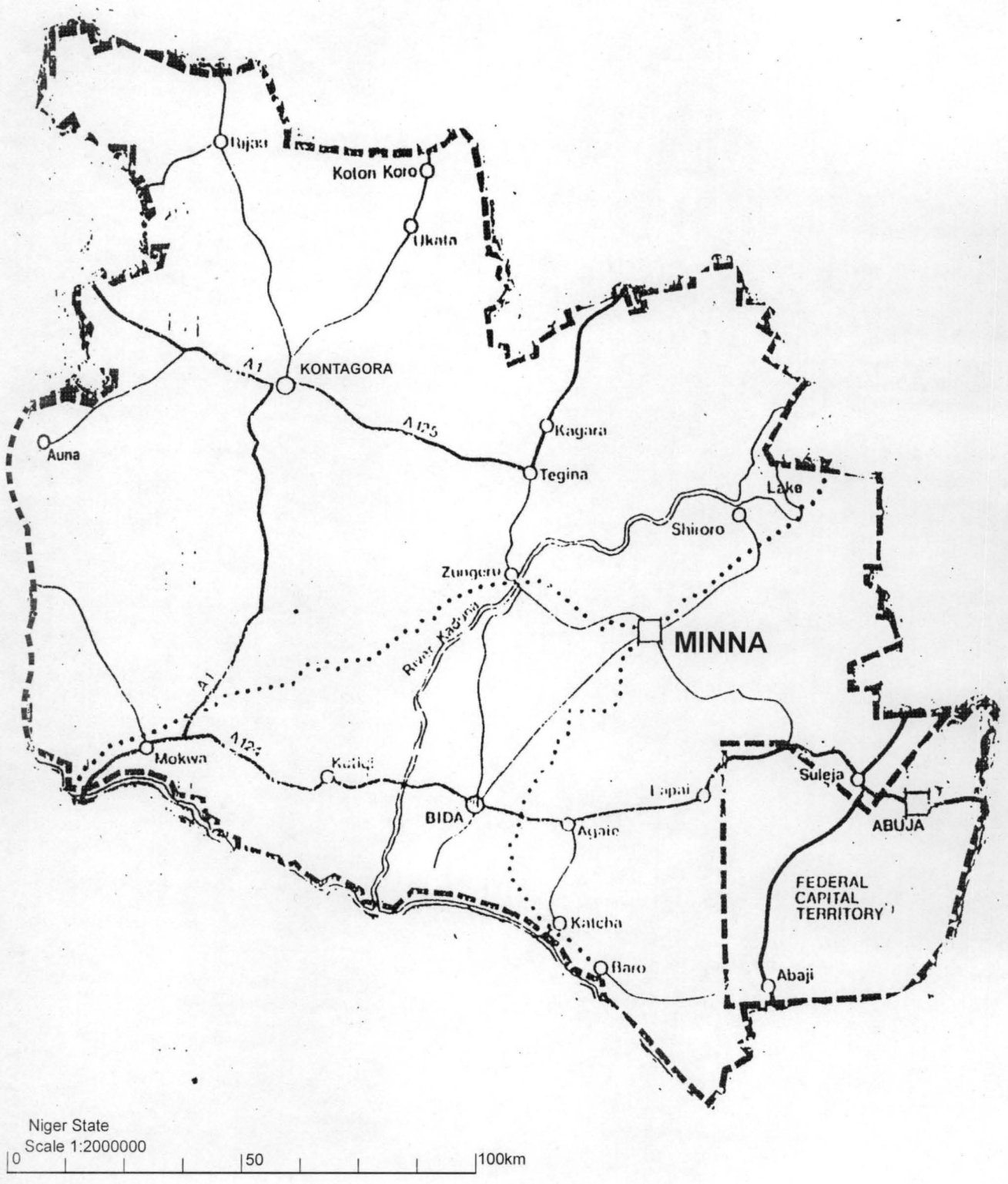
The population of the state in 1963 was 1, 194, 508. With the release of the 1991 population figure by the federal government; Niger State has a provisional figure of two million, four hundred and eight – one people (2, 421,581). There are three major ethnic groups in the state. They are the Nupe, Gwari and Hausa. Other tribes in the state like Kadara, Koro, Samba, Kakanda, Gana-Gana, Dibo, Kambari, Kamuku, Pangu, Dukkawa, Gada and Ingwai belong to the minority group. Tribes from other state like the Igbo, Yoruba and Numerous others also settle in the state.



Map I

Niger State in the Context of the Federal Republic of Nigeria

MAP OF NIGER STATE



MINNA IN THE CONTEXT OF NIGER STATE

TOPIC: A STUDY OF HEALTH HAZARDS ASSOCIATED WITH OPEN REFUSE DUMP

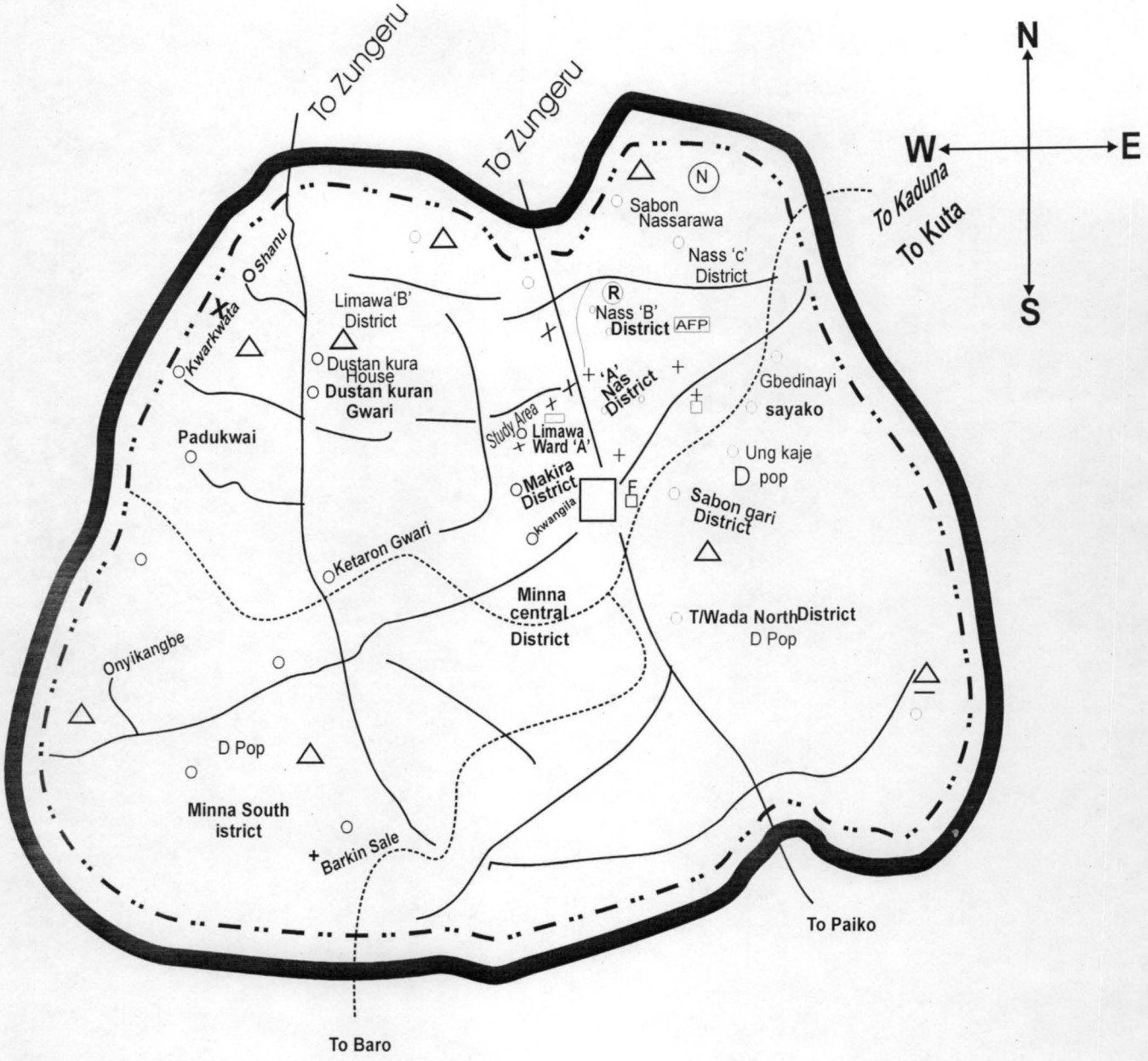
1.6.1 CHANCHAGA LOCAL GOVERNMENT AREA

Chanchaga local government area was one of the first eight (8) local governments when Niger State was created in 1976. In 1984 during the military regime Chanchaga local government was splitted into two, giving birth to Minna Municipal Council with Headquarters at Minna while Kuta remained the Headquarters of Chanchaga local government.

In 1987, however, Minna Municipal Council was renamed Chanchaga local government and the former Chanchaga local government was renamed Shiroro with Kuta being retained as headquarters. Chanchaga local government comprises of seven (7) districts and eleven (11) ward and covers an area of about 3,281 square kilometers, with a population of 3,380,171 (1991 National Census figure).

The seven districts of Chanchaga local government consist of eleven following wards: Nassarawa 'A' ward, Nassarawa 'B' ward, Nassarawa 'C' ward, Sabongari ward, Makera ward, Limawa 'A' ward, Limawa 'B' ward, Katerengwari ward, Soje/Kpakungu ward, Tunga 'A' and Tunga 'B' ward.

MAP OF CHANCHAGA LOCAL GOVERNMENT AREA



D.POP	D. Populated Area	○	Town/Village
	River		Main Road
	Boundary		Railway Line
	Local Government	Ⓝ	Nursery School
AFP	AFP Case	△	School
+	Health Centre	±	Church
☪	Mosque		

LIMAWA WARD IN THE CONTEXT OF CHANCHAGA LOCAL GOV'T NIGER STATE

TOPIC: A STUDY OF HEALTH HAZARDS ASSOCIATED WITH OPEN REFUSE DUMP IN LIMAWA WARD

1.6.2 LIMAWA WARD "A"

Limawa ward "A" is situated in the heart of Minna town, the state capital. The first settlement in Limawa ward "A" is called Anguwan Makafai and later there was old Airport Quarters, Commissioner Quarters e.t.c.

The first people to settled in Anguwan Makafai were living on top of the hills presently housing the two past Head of State, General Ibrahim B. Babangida and General Abdulsalam Abubakar.

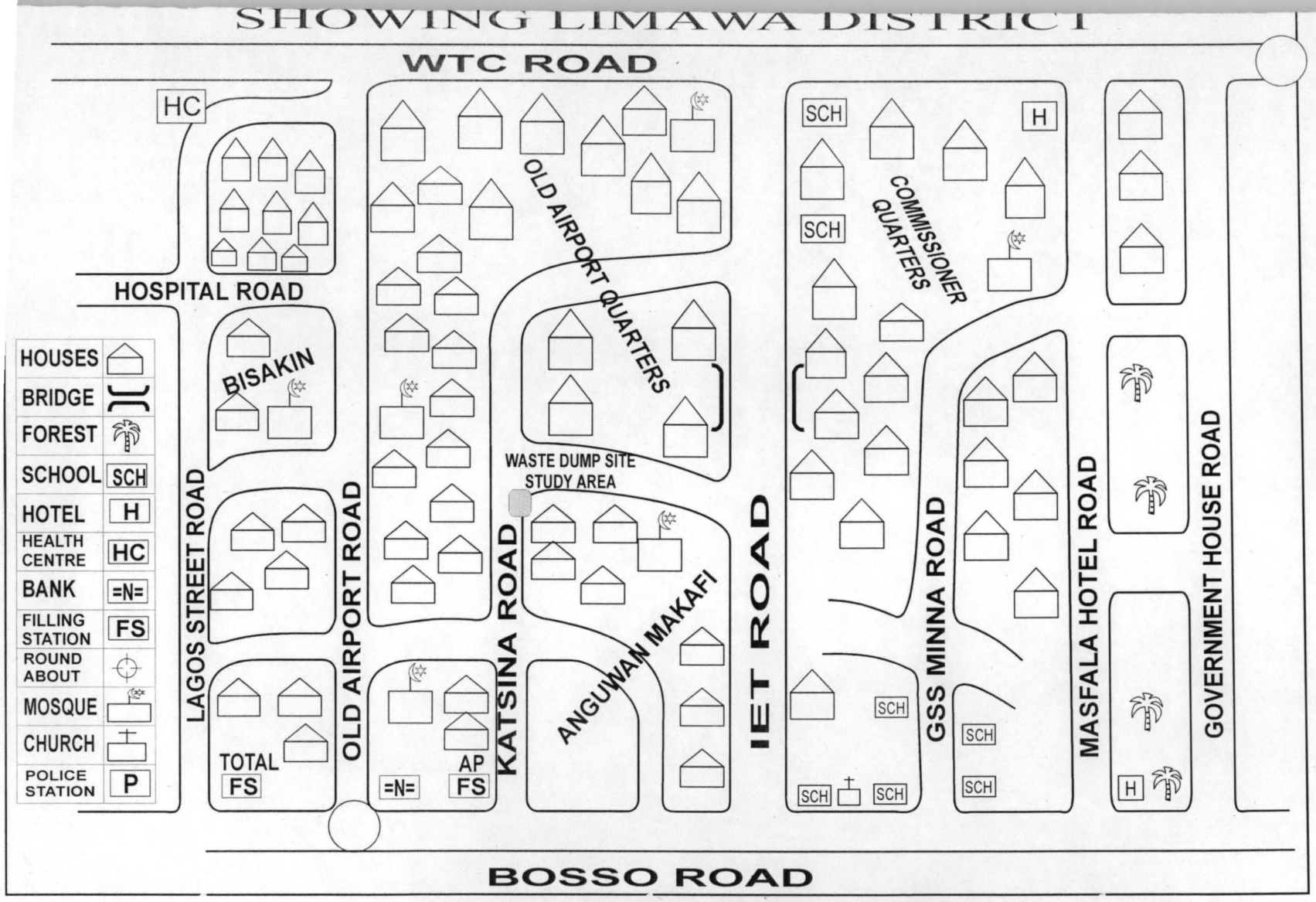
When the British came in 1902, they were asked to leave the top of the hill and eventually these people settled in a area now known as Anguwan Makafai in Limawa ward "A" of Chanchaga local government.

Late Abdullahi Hairu, Late Masugari e.t.c. who were believed to have migrated from Kano, Katsina and other Northern part of the country, were among the earlier settlers in this area.

However Limawa ward "A" have increased both in human population and physical structures over the last 102 years.

Today, Limawa ward 'A' is highly populated with inhabitants of different tribes and background, made up of civil servants, politicians, farmers, traders, artisan and beggars. Also found in this ward are many restaurant, local food vendors and some small-scale industries.

The exact spot at which the dump site used by these inhabitants for dumping refuse, is located at the tail end of Kastina road beside a drainage that passes through the ward.



LIMAWA WARD 'A' IN THE CONTEXT OF LIMAWA DISTRICT

SHOWING STUDY AREA (WASTE DUMP SITE) IN KATSINA ROAD

Source: Designed by the author.

1.7 CLIMATE:-

Niger State experience distinct dry wet seasons with annual rainfalls varying from 1,100mm in the North to 1,600mm in the South. The mean maximum temperatures, which do not exceed 9oof, are between March and June with the lowest minimal temperatures usually in December and January. The seasonal variation of air temperature is constant. Duration of wet season ranges from 150 days or more in the southern part of the state.

The climate, soil and hydrology permit the cultivation of most of Nigerians staple crops and still leaves ample scope for grazing, fresh water for fishing and forestry. The dry season commences in October and the humidity could be as low as 140 degrees in December and February.

1.8 LAND USE PRACTICES

The predominant land use practice in Niger State is continuous arable crop production, followed by small holder fadama cultivation and livestock grazing. Other land use practice include residential, commercial, health and educational institutions and industries. Minna which is the study site doubles as headquarters of Chanchaga Local and State government and

hence the main land use activities in it are residential, institutions and commercial.

Agriculture by means of both continuous arable cultivation and fadama cultivation practices however offered both in small empty spaces within the urban area.

CHAPTER TWO

2.1 LITERATURE REVIEW.

The human environment can be defined as the general surrounding of man and consists of the physical, biological and social environment. (Horton, 1974)

The physical environment comprises the non – living part of the environment e.g. radiation, noise and atmospheric variation (heat, cold, air, pressure). Other physical surrounding of man include the air, water, food, light e.t.c. Some of the physical factors are very vital for life. For instance there can be no life without air, water, food, heat or light.

Biological environment includes all living things e.g. plants, insects, animals and micro – organisms (viruses, bacteria, fungi, e.t.c.) their existence depends on a large extent on the physical environment. For instance the types of plants and animals found in a place depend on the characteristics of air, water food temperature and humidity existing in the area. The high temperature and humidity of the tropical environment thus favours the rapid proliferation of disease vectors and micro – organisms and the abundance of such disease as malarial, filiariasis, onchocorasis and other vector – borne diseases. (Lucas. 1991)

The social environment or socio – cultural environment is that part of the environment which plays a prominent role in determining the mental health of man and includes all the conditions affecting man as a member of the society, e.g. culture, including beliefs and attitudes, educational system, housing e.t.c the continue interaction between man and his social or psychological environment may influence his health either positively or negatively.

Man through his activities and actions effects changes in the environment. The change may affect man directly or indirectly through his supplies of water, food and other condition. Man can pollute his environment and thereby constituting health hazard through his activities and preoccupation (Feacharm, 1977).

2.2 ENVIRONMENTAL POLLUTION.

Environmental pollution can be defined as the unfavourable alteration of our surroundings wholly or largely as a by – product of man's actions, through direct or indirect effects of changes in energy patterns, radiation levels, chemical and physical condition and abundance of organisms. For simple terms, when man works, plays, breaths, fights or eats, he creates environmental stresses

which may in turn extents some influence on his health (Berry B. J. L. 1974).

Communicable and non – communicable diseases result from an interaction between a host, an agent and the environment. In an ideal situation, the agent, the host and the environment maintain a dynamic state of equilibrium. A change in the environment can upset the balance leading to multiplication with man. It is necessary to maintain a healthy environment in order to prevent or control a variety of diseases conditions that may result from poor environment (P. A. Akinbola 1991).

2.3 POLLUTION BY SOLID WASTES.

An account of pollution which does not include the disposal waste is far from complete in our circumstances. The disposal of solid wastes has become one of the most urgent and difficult problems for the crowded urban centres of the world (Adeoye A. S. 1979).

The unsightly heaps of garbage found in conspicuous places of cities like Lagos, Kano, Ibadan e.t.c. has long been known to constitute public health hazards. (Adeoye A. S. 1979).

In some parts of the world, solid wastes are being used as landfill but land for this purpose is becoming less available and

more expensive in many cities. Sea disposal of solid wastes has been used increasingly, but the impact of the disposal of such different materials into the sea is yet to be assessed fully.

The fact that many urban communities have no adequate supply of pipe borne water makes it important for the wells, boreholes and rivers around the urban centers provide more sources of drinking water. Yet, most of these rivers, wells and boreholes are highly polluted by discharge and leaching of wastes into them. This, in many town the sources from which pipe borne water supply for the urban residents is obtained are polluted enough that the water must have to be heavily treated and chemically disinfected before it can be rated high on the scale of palatability. (Acharya R. J. 1970).

2.4 WHAT IS WASTES?

Wastes can be described as any matter whether liquid, solid and gaseous or radioactive, which is discharged, emitted or deposited in the environment or manner as to cause an alteration of the environment. However the concept of waste embraces all unwanted and economically unuseable by – product at any given place and time and any other matter which may be discharged, accidentally or otherwise to the environment. (Skitt J. 1967).

From the above definition of general wastes, solid wastes could be described as all material of a solid or semi-solid character that the processor no longer considers of sufficient value to retain in the cause of producing, processing and consuming useful products. The materials contain in this case are food wastes, bottles cans, plastic, polythene bags, papers, packaging, rags e.t.c. Solid waste management embraces effective controlling of the production, storage, collection, transportation, processing and disposal or utilization of solid wastes in a sanitary aesthetically acceptable and economical manner. (Acharya R. J. 1970).

2.5 WHAT MAKES SOLID WASTES?

A great many material have been categorized under the broad heading solid wastes. Solid wastes included the more familiar type of refuse such as garbage, old newspapers, packaging materials, and other items that are discarded by a typical household like bulky appliances, old furniture, dead trees, junked automobiles, construction ruble and demolition debris. (Adeoye A. S. 1979).

Also included are the commercial and industrial refuse materials such as waste paper, damaged or discarded products, scrap metal and food processing. Most of these wastes are

generated from residential and commercial land uses. They are the most offensive and most dangerous to health when they accumulate where people lives. Agricultural wastes such as crops residue, livestock manure are recognized as being the largest single source of solid wastes especially in America.

"As Maganhey (1968) pointed out, waste are not just the failing or production but eventually, the product itself".

Solid wastes quantities have been increasing steadily over the years and are expected to continue to increase in the future ahead as the growth of town accelerated.

2.6 FACTORS THAT INCREASE WASTES.

The present dangerous, unhealthy condition of the environment has grown from three – related factors;

The first is the rapidly population of man on a planet that has a limited capacity to absorbed his garbage generated. The second is mans' spectacular progress in the technological scientific filed during the present century. And the third is the greater material expectation and energy consumption of many society which put pressure upon industries whose products and by products contribute significantly to pollution. And one of the impact of city on the environment is the dumping of wastes at a rate that exceeds

the natural capacity of the ecosystems to degrade those wastes by itself.

2.7 DISPOSAL TECHNIQUES.

In recent years the character of refuse has been changing because of new techniques in food packaging and its disposal. The significant effect of these new techniques has been to change the composition of refuse, reducing the proportions of wet garbage and ash.

There are about five methods which are currently used or could be used to dispose of refused. They are:

(i) Open dumping.

(ii) Incineration.

(iii) Sanitary landfill.

(iv) On the site.

(v) Composting.

2.7.0 OPEN DUMPING.

An open dumping is an area where refused is dumped and allowed to remain exposed to the atmosphere. In addition rodents, flies and domestic animals have access to the refuse.

2.7.1 INCINERATION.

This is a process of reducing the volume of refuse by burning.

2.7.2 SANITARY LANDFILL

Generally, in a sanitary landfill, refuse is tipped in trenches cells prepared to such a width that the daily input of refuse can be effectively covered presenting a clean face each day.

2.7.3 ON THE SITE

This is a kind of household disposal method. It aids in reducing the cost of refuse collection by reducing the volume that must be handled to central disposal site.

2.7.4 COMPOSTING

This is biological process in which the organic material in refuse is converted to a useable stable materials by the action of micro-organisms present in the refuse.

2.8 SOLID WASTES AND HEALTH

Air, water land and noise pollution, all adversely affect man and his environment in many ways. They diminish the value of his agricultural products. They obscure his view and add unpleasant smells to his environment. And most important of all is that it endanger his health. (Skitt J. 1967).

The diversity of solid wastes results in variety of potential health and welfare effects. The treatment could be complicated by

the fact that each waste often demands specific and yet different methods of disposal. Solid wastes have been demonstrated conclusively to be sources of certain disease such as cholera, typhoid and dysentery etc. Lack of proper disposal techniques help to create suitable environments from which diseases can be transmitted (Hanks 1967).

The method could be through;

a. Air borne solids

b. Direct contact

c. Water supply

d. Food supply

2.9 ENVIRONMENTAL HEALTH AND SANITATION

Environmental health can be defined as the control of all those factors in a mans' physical environment which may cause bad effect on his physical, mental or social well-being. (Obemeata, J. O. 1991)

While environmental sanitation is the process of taming the environment so that it does not constitute hazard to man. In particular environment health and sanitation deals with the following activities;

a. Provision of safe and adequate supply of water.

b. Proper and safe disposal of sewage

c. Proper disposal of solid waste (refuse disposal)

d. Safeguarding of food supplies (food hygiene)

e. Control of disease vectors and pests e.g. arthropod, rodent, mouse, and mosquitoes etc.

f. Control of atmospheric pollution, i.e. to ensure the external atmosphere is free from deterious elements.

g. Elimination of other hazards e.g. radiation, noise, temperature.

h. Provision of good housing.

The measures adopted to control or protect the environment are based on the observation of the relationship between the environmental factors and disease and do not have the same formula. Such measures range from specific technological measures to health education and health legislation.

The responsibility of environmental sanitation in many countries is that of ministry of public work and local authorities. In Nigeria, environmental sanitation are dealt with by public health or sanitary engineers, technicians and environmental health officers formally know as health superintendents.

2.10 IMPACT OF REFUSE DUMP ON ENVIRONMENT AND HUMAN HEALTH

2.10.1 PUBLIC HEALTH NUISANCE

The surrounding of most waste dumps are extremely dirty and smelly. These readily serve as habitats for rodents, flies, microbes and other vectors of various common diseases like malaria. A wide range of disease born by flies, rodents and mosquitoes e.g. typhoid fever, malaria, filariasis, yellow fever, schistosomiasis etc may be prevalent in communities where solid wastes are left exposed for long periods. A number of epidemics in some major Nigeria cities have actually been associated with accumulated municipal solid waste. Adeslima (1986).

2. 10.2 FIRE HAZARDS AND SPONTANEOUS COMBUSTION

Spontaneous combustion occurs in waste dumps when large amount of organic material decompose, usually initiated by action of aerobic (oxygen loving) bacteria and the heat released is not all able to escape, so that the temperature of the mass rise. When the solid wastes at a dump sites include large proportion of dry grass, wood chips, papers etc spontaneous combustion may be a serious hazard. (Onokerhoraye A. G. 1976)

The potential of spontaneous Combustion is worsened by the usual phenomenon or gas production in major solid was the dump. The principal gaseous product of anaerobic decomposition of organic wastes is methane, although other gases such as carbondioxide and hydrogen sulphide are also present. Wastes buried in land-fills undergo predominantly anaerobic decomposition, and the gases rise to the surface.

2.10.3 IMPACT ON SURFACE WATER QUALITY

Dumped solid wastes contaminates surface water through leachate formation. Leachate is produced by two means:- (Avnimelech 1979) .

A. During decomposition, organic waste usually produces liquid termed "Leachate" as a result of the pressure applied to low-lying wastes by upper – lying wastes, which squeeze out the liquid.

B. Rain water passing through an exposed solid waste dumped or a land-fill dissolves out of large range of materials from the waste and is described also as leachate.

The characteristics of the contaminating leachates depends on those of the leached wastes and the rain water. The contaminants are carried through run off water into nearby water bodies leading to significant pollution of such resources. A typical

stream or river contamination by such leachate may develop elevated concentrations or parameters such as dissolved solid cations, anions, toxic heavy metals and microbial. Raveh and Avnimelech (1979)

Such changes in the physicochemical properties of the streams and rivers make them unfit for fisheries, recreation and domestic uses (drinking, cooking and washing).

2.10.4 IMPACT ON GROUND WATER QUALITY

Underground water is the major source of drinking water for many people. it is therefore of serious concern that solid waste dumping can negatively impact this vital resource. That ground water is readily contaminated by this means is well established. Coe (1979), Lindorff "(1979), Raveh and Avnimelech (1979).

Open dumping and land filling area equally liable. The waste so disposed is readily leached by rain water which percolates and migrates through soil and rock formation to contaminate the ground water. Sometimes, the water may directly leach the waste buried deep in the landfill. The consequences of drinking such contaminated water includes gastrointestinal disorders, several domestic ailments and even death. (Lindorff 1979).

CHAPTER THREE

3.0 METHODOLOGY OF STUDY

3.1 DATA COLLECTION

Data is a necessary tool to planning, prevention and management of any identified problem. It is therefore paramount need that information should be available on the danger and all possible health hazard associated with open refuse dumping in a residential area. It is also necessary for the selection of best disposal method and facilities most suitable and economical refuse collection administration when analysed.

3.2 METHOD OF DATA COLLECTION

In order to achieved the stated aims and objectives, various lines of approach or methods of data collection ought to be adopted. Those includes;

(i) Making references to published and unpublished document to the study.

(ii) Conducting field surveys and result analysis

(iii) Laboratory sample analysis

(iv) Personal interviews and discussions

(v) Literature review and library research

3.3 METHOD OF DATA ANALYSIS

A number of questionnaires will be designed as a guide for field work to investigate the level or the rate of infection of diseases and level of exposure to health hazards in Limawa ward "A" as a result of open refuse dump. Also to investigate the operations of the deficiency in the management.

The proposed questionnaires will be directed to five bodies; (The State Environmental Health Services, Local Government Health Services Urban Development Board, Clinic/ Health Centers and Inhabitants of the Study Area).

The questionnaires will be administered directly by the author and with the aid of some staff of both state and Local Government Environmental Health service. The author will also have a formal discussion with some government officials and other parastatals both operating within and outside the study area.

Personal visits will be made to disposal sites within the study area to asses the existing conditions around them and to know how they are controlled and maintained. In addition to this, pictures will be taken to show clearly the menace of open refuse dump.

CHAPTER FOUR

4.0 DISCUSSION OF RESULT

4.1 TABLE 4.1:- Prevalent Of Common Diseases In Limawa Ward

Common diseases	No of respondent with knowledge of the disease	No of respondent without knowledge of the disease	Total	%
Malaria	41	0	41	23.7%
Typhoid fever	39	0	39	22.5%
Diarrhea & vomiting	39	0	39	22.5%
Desentry	31	0	31	18%
Skin infection	23	0	23	13.3%
Total	**173**	**0**	**173**	**100%**

Source:- field survey by the author October, 2004

The above table 4.1 represent the prevalent of common disease among Limawa ward residents. The table shows that the common diseases in the study area varies slightly for instance malaria account for 23.7% while typhoid fever and diarrhea and vomiting account for about 22.5% each. Desentry and skin infection account for 18% and 13.3% respectively. This implies that most of the common diseases can be found in the study area.

4.2 Table 4.2:- Prevalent of Common Diseases as a result of open refuse dump within Limawa residential area

Two groups of People	No. of Respondent	No. of male	No of female	Total	%
Residents of Limawa Ward A	16	11	5	16	41%
Health Workers in Limawa Ward	23	15	8	23	59%
Total	**39**	**26**	**13**	**39**	**100%**

Source:- field survey by the author October, 2004

Table 4.2 above represents why common diseases are prevalent among Limawa ward residents as a result of open refuse dump in Limawa ward. The table shows that, 41% residents of Limawa ward that responded believed that prevalent of the common disease is largely due to indiscriminate refuse disposal and filtty and dirty environment as a result of open refuse dump within the Limawa residential area.

While 59% of Health Workers practicing in Limawa ward agreed that prevalent of common diseases is largely attributed to open refuse dump located within Limawa residential area. This however implies that most of the common diseases prevalent in Limawa ward as a result of open refuse dump located within the study area.

4.3 EXPOSURE OF LIMAWA WARD 'A' RESIDENT TO HEALTH HAZARDS

From the data collected from field survey and interview conducted among Limawa residents, it was found out that the residents of Limawa ward are expose to the following health hazards;

i) Sustaining of physical injury from dump site

ii) Inhaling of offensive odour from dump site

iii) Inhaling of smoke, harmful dust and particles from dump site.

iv) Presence of harmful creatures like snakes, scorpion in the dump site.

v) Fire hazards and spontaneous combustion from dump site.

TABLE 4.3.1:- Record of Reported Cases of Physical Injury and Scorpion Stings from Dump Site in Limawa Ward.

Victims	Average cases per month	Average cases per year	Total
Adult	2	24	24
Children	5	60	60
Total	7	84	84

Source:- Field survey by the author October, 2004

Table 4.3.1 above represent records of reported cases of physical injury and scorpion stings from dump site in Limawa ward. The table shows that the children are most affected with the highest number of case, that is average of 60 cases per year compare to the of adult which is at average of 24 cases per year.

However the total average cases per year for both children and adult is estimated to be 84 cases.

4.4 LEVEL OF ENVIRONMENTAL POLLUTION

To determine the level of environmental pollution in Limawa Ward "A", Physical observation and field survey was carried out. And the first to be found or observed at the site is the conspicuous unsightly heaps of garbage as shown in plate 1 and 2. The surrounding of the waste dump were extremely dirty and smelly to the extend that the passer- by or person standing few meters away from the dump site most have to cover his/her nose because of the offensive odour been produce from the waste dump.

It was also observed that the surroundings were littered with refuse to the extend that more than half of the road is been taken over by the refuse as shown in plate 3 and 4.

PLATE I: OPEN REFUSE DUMP SITE IN LIMAWA WARD 'A'

Source: Field Survey October, 2004

PLATE II: UNSIGHTLY HEAPS OF GARBAGES IN LIMAWA WARD 'A'

Source: Field Survey October, 2004

PLATE III: Surrounding Littered with Refuse, Covering more than Half of Katsina Road in Limawa Ward 'A'

Source: Field Survey October, 2004

PLATE IV: Waste Dump Site Taking Over Katsina Road, In Limawa Ward 'A'

Source: Field Survey October, 2004

4.5 POLLUTION OF AIR BY REFUSE FROM DUMP SITE

During the field survey, it was observed that most of the time, smoke is always being produced or emitted in to atmosphere from the burnt refuse. Also observed at the dump site was the scattering or emission of particles and dusts in to atmosphere from the refuse dump any time there is storm or heavy wind blowing across the refuse dump. And the health consequences of inhaling this polluted air is respiratory track infection and other air borne diseases.

4.5 LEVEL OF WATER POLLUTION

Well water is one of the major sources of drinking water for Limawa ward "A" residents. Therefore to ascertain or to investigate the level of pollution of this source of water, samples of both well water near to and far from waste dump site were tested and analysed in laboratory. And at the end of the laboratory test and analysis, the following result was obtained as shown in table 4.6.1 below.

4.5.1 TABLE 4.6.1:- Characteristics of Some Well Water, Near to and Far from Waste Dump Site

Parameter	Well Near Dump Site	Well far from dump site	Standard for portable H_2O (WHO)
Turbidity	5 – 6 mg/ L	2	5
Dissolved solid	70 – 560mg/L	52mg/L	50mg/L
Conductivity	190 – 780μs	98.2μs	-
Alkalinity	11 – 14 (tve)	10 – 12 (tve)	- ve
Methylene (BT)	0.10 – 0.48 mg/L	0.10 mg/L	0.5mg/L
Ammonia	0.51 – 9.7 mg/L	0.51 mg/L	0.1 mg/L
Nitrate	3.32 – 0.70 mg/L	0.10mg/L	0.5mg/L
Phosphate	0.32 – 0.70 mg/L	0.10 mg/L	0.5mg/L
Copper	2.1 – 4.6 mg/L	2.1mg/L	0.3 mg/L
DO_2	92mg/L	101.1mg/L	-
Salinity	0.4%	0.1%	-

Source: Compiled by the author, October 2004

Comparing the parameters obtained from laboratory test as shown in table 4.6.1 of Well water near dump site and that of Well water far from dump site and also the acceptable standard of portable water by World Health Organization (WHO). It is clear that water from Well near dump site is contaminated as a result of pollution from waste dump site.

Therefore the consequences of drinking this contaminated Well water with unacceptable level of turbidity, dissolved solid, alkalinity, Methylene, Ammonia, nitrate, phosphate and copper includes; gastrointestinal disorders, several domestic ailments and even death.

4.6 TABLE 4.7:- Knowledge of frequent out break of diarrhea and vomiting in Limawa ward

Knowledge	No. of Respondents	Percentage %
YES	39	92.9
NO	3	7.1
TOTAL	**42**	**100**

Source:- Field survey, October 2004

The above table 4.7 represent the percentage of people that have knowledge of frequent out break of diarrhea and vomiting in Limawa ward because of indiscriminate disposal of refuse and dirty environment. As shown in table 4.7 above, 92.9% of respondents agreed that frequent out break of diarrhea and vomiting in Limawa ward is largely due to contaminated water dirty and filty environment as a result of open dumping of refuse in the area. Only 7.1% of respondents says that, they are not aware of the frequent out break of diarrhea and vomiting in Limawa ward.

4.7 TABLE 4.8:- Records of Reported cases of malaria, diarrhea, and vomiting in Limawa ward (2003)

Diseases	In & out patient cases, < 5 yrs	In & our patient cases 5 yrs	In out patient cases above 5 yrs	Total cases	Death
Malaria	48	67	55	170	-
Diarrhea & vomiting	29	16	21	66	-
Total	**77**	**83**	**76**	**236**	**-**

Source:- Field survey by the author October, 2004

The above table 4.8 represent records of reported cases of malaria, diarrhea and vomiting in the year 2003 in Limawa ward. The above shows that malaria is more prevalent than diarrhea and vomiting in Limawa ward. Malaria account for 170 cases, while diarrhea and vomiting account for 66 cases which cut across the ages of less than years to above 5 years.

However at the time of compilation of this report there was a reported cases of diarrhea out break in Limawa ward and other part of Minna town. Records of the out break were not available at the time of this study.

PLATE V: Evacuation of Refuse From Waste Dump Site In Limawa Ward 'A'

Source: Field Survey October, 2004

PLATE VI: Evacuated Dump Site In Limawa Ward 'A'

Source: Field Survey October, 2004

CHAPTER FIVE

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY

Environmental Pollution is a problem that threatens the life and safety of all earthly living organisms. With increasing dumping of refuse in a residential are, the inhabitants of the environment are more closely exposed to the risk of health hazard. In this study, it was found out that one of the major source of water (Well water), air and the surroundings of the study area are highly polluted, due to open dumping of refuse in the study area. And as a result of this pollution, disease like Malaria, Skin Infection, respiratory infection, diarrhea and vomiting are prevalent in the study area.

5.2 CONCLUSION

There is no doubt that our environment is heavily polluted and there is an urgent need for pollution control. The analysis from the laboratory test and field survey had shown that Limawa ward 'A' is heavily polluted as a result of open dumping of refuse in the area.

And to protect the health of Limawa residents and to guide against avoidable disease out break and death, open refuse dump which have become mosquito larvae factory, breeding ground for

many disease vectors like flies, cockroaches, rats e.t.c and habitat for dangerous creatures like scorpion and snake, need to be relocated to a non residential area.

However to maintain a clean and healthy environment, there is need to involved Limawa residents and the general public in enlightenment campaign on the importance of proper refuse disposal, environmental sanitation and health implications of dumping refuse within a residential area.

Finally this study, as one of its objective was able to completely evacuated all the refuse from the waste dump site in Limawa Ward "A" and the dump site relocated to another non residential area.

The evacuation was however carried out by Niger State Urban Development Board with the assistance from a construction company called Triacta Nigeria Limited, as shown in plate 5 and 6.

5.3 RECOMMENDATIONS

In view of the danger posed to the health and general well being of the residents of Limawa and the general public because of the open dumping of refuse in Limawa ward and other part of Minna town, the following recommendation are hereby made to solve and check such problems.

1. Niger State Urban Development Board should be adequately funded so as to discharge their responsibilities.
2. More staff should be employed and trained by NSUB, so as to provide the needed manpower.
3. Waste disposal sites should be establish at different locations out side the residential areas.
4. Dumping of refuse into streams, drains, open spaces and indiscriminate burning of refuse should be prohibited.
5. Residents of every ward in Minna town should be involve in the management of waste disposal and environmental sanitation.
6. House to house inspection by Health Inspectors (Duba Gari) should be resuscitate to ensure environmental laws compliance by the residents.
7. To achieve the desired goals and objective of a clean environment, a continuous public enlightenment, by local authority, government agencies and NGOs e.t.c. should be put in place.
8. And for a long term solution, there is need to commercialize the collection and disposal of refuse.
9. Finally, three methods were recommended for disposal of solid wastes. They are:-

a.) ***Sanitary Land Fill Method:-*** Usually performed by depositing the wastes in a natural or man made depression, then composting them into small particles volume.

b.) ***Recycling Method:-*** Wastes recommended for this method include paper, plastic product and metals etc.

c.) ***Composting method:-*** This is biological process in which the organic material in refuse is converted into useable material by the action of micro-organism present in the refuse.

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APPENDIX 1

QUESTIONNAIRE FORM "A"

PROJECT: - A study of Health Hazards Associated with Dumping of Refuse in Limawa "Ward A": ***(Implications and Remedies.)***

SECTION A

Background Information

1. Sex of Resplendence:. .....
2. Age:- .....
3. Residence (Ward):- .....
4. Occupation .....
5. Level of Education:- (a) Primary (b) Secondary
   (c) OND/NCE (d) HND/ Degree

SECTION B

6. Do you dump refuse yourself or you send your children or younger ones? .....
7. Have you or any of your household ever sustain any type of physical injury when dumping refuse or playing at dump site? (a) Yes (b) No
8. If yes to question "7" which type of injury is it? .....
   .....
9. Are you and your household facing any problem with the dumpsite located close to your house?
   (a) Yes (b) No
10. If yes to question 9 above, which type of problem is it? .....
11. Is it proper that dumpsite is located close to where you live?
    (a) Yes (b) No
12. If No to question 11 above, why is it not proper?

SECTION C

13. Which of the following is/ are your source (s) of water for drinking and cooking (a) Borehole (b) Tap (c) Well (d) others specify.

14. What type(s) of infectious disease do you and your household experience most?

    (a) ..... (b) ..... (c) .....

    (d) ..... (e) ..... (f) .....

15. How often do you experience such infectious disease?

    .....

16. What do you think is / are the cause(s) of such infectious disease?

    .....

APPENDIX II

QUESTIONNEIRE FORM "B"

PROJECT: - A study of Health Hazards associated with dumping of refuse in Limawa "Ward A" ***(Implications and Remedies.)***

SECTION A

Background Information

1. Sex of Respondent .....
2. Age .....
3. Residence (Ward): .....
4. Occupation: .....
5. Level of Education: - (a) Primary (b) secondary
   (c) JCHEW/CHEW/ CHO
   (d) Nurse/mid- Wife (e) Pharmacy (f) Doctor
   (g) Others specify

SECTION B

6. Limawa ward children's injury are mainly from: -
   (a) House (b) Road side (c) dump site (d) other places (specify)
   (d) Don't know.

7(a) what is /are the common diseases Limawa Ward residents suffered most?

(a) ..... (b) ..... (c) .....

(d) ..... (e) ..... (f) .....

7(b) Are these diseases infectious?

(a) Yes (b) No

8. If Yes How often do they come to your Health Centre /Clinic or Pharmacy store to complain of such infectious disease for treatment?

.....

9. As a Health Worker practicing in Limawa ward, have you Experience any infectious disease outbreak among the Limawa residents?

   (a) Yes (b) No

10. If Yes, What type(s) of infectious disease is it?

    (a) ..... (b) ..... (c) .....

11. How often does the outbreak occur: .....

12. What is the magnitude of the outbreak? .....

13. What do you think, as a Health worker is / are the cause (s) of these prevalent Infectious disease among the Limawa ward residents?

    (a) .....

    (b) .....

    (c) .....

    (d) .....