ASSESSING THE EFFECTS OF ENVIRONMENTAL SANITATION ON PROPERTY VALUES

(A CASE STUDY OF MINNA METROPOLIS)

BY

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BEING A PROJECT SUBMITTED TO THE DEPARTMENTOF GEOGRAPHY, FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA, NIGER STATE.

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CERTIFICATION

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DECLARATION

I hereby declare that this work has been written by me as a record of my research work. It has not been presented in any presious application for any level of post graduate programme in Environmental Management. All quotations are indicated and the sources of information are duly acknowledged.

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Yusuf Nasidi

DEDICATION

This project work is dedicated to my parents Late Alhaji Nasidi Tela (Barayan Minna), Hajiya Hajara Mada Nasidi, my wife Maimuna G.A. Yusuf and my son Mohammed Fahad Yusuf Nasidi and to the entire family of Alhaji Nasidi Tela Barayan Minna, too many to mention.

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My sincere thanks and appreciation go to Dr. G. N. Nsofor for all the advice he rendered at various critical stages of this project. Infact, without his preparedness to help this project work would not have been seen the hight of the day. Once again, I thank him.

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ABSTRACT

The continues increases in human population in the past of few years (as indicated by the population census result) has given rise to a similar increase in urbanization. These increase have also jointly led to increases in industrial, agricultural commercial and residential activities. As a result of the above scenario, complete problems affecting several areas of human endeavors have continued to emerge.

One of the problems is the increasing generation of solid wastes. Solid waste generation has increase both in nature and in volume over the years. This phenomenon no doubt constitutions a disturbing threat to both human environmental well being and property values.

There is therefore the need for a concerted effort to be made towards assessing the effect of environmental sanitation on property values.

There is also the need to understand the type of waste generated among house hold, to verify environmental sanitation

among neighborhood and to assess the relationship between sanitation and property values. With regard to the study area of this project, questionnaire have been used and resulting data analyzed

Finally efforts and studies should be made towards identification of the best method of solid wastes management that have the capabilities of curbing the effect of sanitation on property values for now and into the future. This has been touched in my recommendations in the last chapter of this project.

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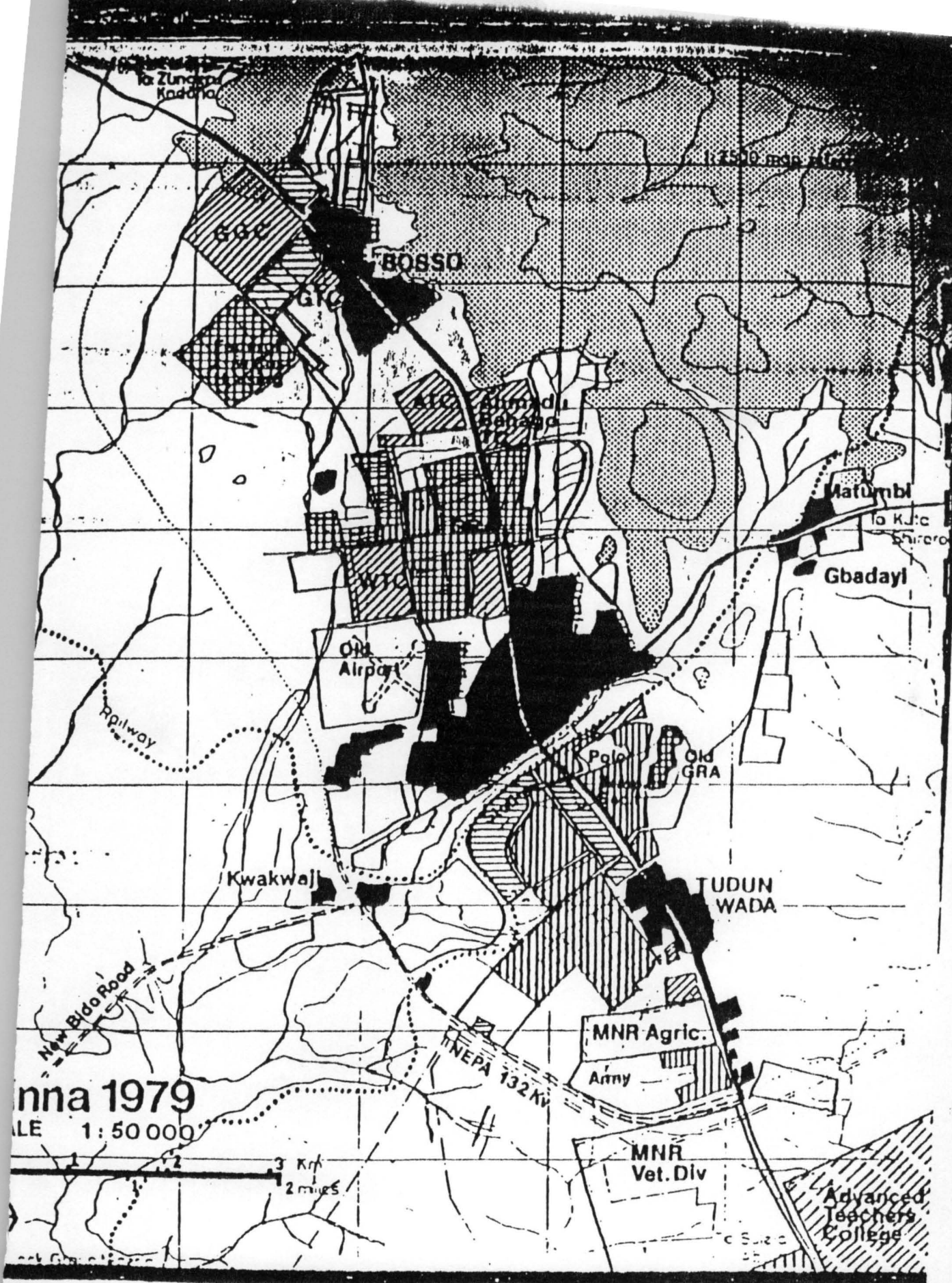


SOURCE: Minna, master plan (1979-2000) Max Lock grp Rd.

Study Area Map

CHAPTER ONE

1.0 INTRODUCTION

A feature of urban scene in Nigeria in recent years is the gradual take over of virtually every available open space by refuse. Apart from physically obstructing legitimate human activities, the refuse dumps have become fertile ground for breeding mosquitoes, flies and other pests which have in effect constituted dumps into grave health hazards.

In city after city, hills of solid waste are seen on streets, and in open spaces. These waste to say the least, disfigure city image and not only create an eyesore, but also pose tremendous health hazards and exert much influence on property values in the area in which they are found.

Waste generation is inevitable, infact history has it that no civilization, primitive or modern arises without generation of some form of wastes.

The story of waste dates back to advent of man on the earth surface. Man in every stage of civilization, no matter his occupation of social status generates waste especially solid one but the rate of generation and method of disposal variety.

The trend in property values, influenced by generation and management of waste, physical delay and deterioration of properties and level of sanitation within the study area forms the subject matter of the study or research work.

This project dissertation is an attempt to uncover the various relationship between environmental sanitation and property values using Mina metropolis as a case study. In a bid to properly take this problem, the dissertation is written in five chapters with each chapter highlighting on specific aspect of the Project.

1.1 BACKGROUND INTRODUCTION

Minna, the focus of this project work is the capital of Niger State. Minna was about about two decades ago, one of the small human settlements in the Niger province of the defunct North western state.

Minna was still in a status of a rural setup when, in 1976, the then Military Government of Late General Murtala Muhammed created Niger State with Mina as its capital. This exercise marked the beginning of the departure of Minna from rural settlement to a growing urban settlement.

The eventual status of Mina as a state capital soon started to witness the influx of people both from the rural areas of the young state and from other parts of the country. The influx of people in large numbers proved a massive physical expansion of the town in order to make accommodation available for the people coming in. As in creasing population led to the physical expansion of

Minna, business, agricultural and domestic activities were expanding.

In the early years of Minna being the state capital, problems of solid wastes management were not noticeable. Now that the physical and human growth have reached high levels, disturbing problems of solid waste management have become glaringly noticeable almost every where and it exerts influence on property values.

1.2 STATEMENT OF PROBLEM

The study basically is embarked upon so as to assess the various state of poor solid waste management prevalent in some parts of Minna metropolis tend to have a significant influence on the quality of the environment and poses tremendous health hazard and exert much influence on property values, these arouse the researchers interest to carryout the research work.

1.3 AIM AND OBJECTIVES

This project dissertation specifically aims at examining the problem of environmental sanitation and its influence on property values in Minna metropolis.

The objectives of the study therefore include;

1. To study waste generation among house holds in Minna.
2. To verify in environmental sanitation among neighborhoods.
3. To access the relationship between sanitation and property values.

1.4 JUSTIFICATION

This research work is intended to be used to identify the nature and sources of solid waste

generation and management how it will influence property values.

The study is also expected to open up new ideas on better environmental sanitation strategies aimed at ensuring a minimum level of environmental hazards.

The study will also promote awareness to people on how harmful indiscriminate solid waste dumps in the neighborhood can be to health and how it will affect property values.

1.5 SCOPE OF THE STUDY

The study is limited to solid waste generation and management and the surrounding buildings, environmental within Minna metropolis.

1.6 SIGNIFICANT OF THE STUDY

The significance of this study cannot be over emphasized. It will be relevant to the government especially as it relates to environmental policies and the individual investors and occupant of properties. It will also be useful for town planners who are interested in land allocation according to officially criterion and in managing the urban environment.

1.7.0 STUDY AREA

1.7.1 LAND FORM

The total landmass of Minna is underlain by hard rocks, there is also the thread of increased rocky nature of the landmass if erosion and deforestation activities are not checked. The water

table in Minna is usually quite high and wells are sank to a comparatively shallow depth before water is struck. If solid waste are not properly managed therefore, there will be the risk of contamination of wells and this can constitute health hazard.

1.8.0 CLIMATE

Like the rest of West African sub-region, the climate of Minna is influenced largely by two dominant air masses affecting the sub-region. They are the dry and dusty tropical continental air masses and the warm moist tropical moiture air masses. There is dynamism in the climatic condition which determines the nature of rainfall regimes, the temperature and the wind.

1.8.1 RAINFALL

The rainy season is usually from the month of April to October. In some years however, the first two weeks of the month of November also witness some rainfall. Although the beginning of rainfall is recorded in the month of April, the rain becomes steady between the months of June and July and the highest rainfall is recorded between the month of August and September. Excess rainfall could cause a lot of damages if solid waste are not properly managed.

1.8.2 TEMPERATURE

In Minna the highest level of atmospheric humidity is between the months of Months of March, April and May before the onset of the

rainy season. During this period the atmospheric temperature rise up to $38^{oc.}$ The lowest temperature is recorded from the end of December to the end of February. The rise in atmospheric temperature during the period can be linked to highest amount of sunshine experienced used for building period. Temperature may facilitate air pollution, if solid waste are left untreated. Thus temperature may cause a threat to health of individuals if refuse are left to decompose, it will tend to affect property values in the study area.

1.8.3 WIND.

There is the occurrence of heavy destructive wind that accompanies the early rain storms, usually in the month of April and May. Another

similar wind comes again towards the and of October signaling the end of the rainy season. During the months of January and February, strong harmattan winds are also experience of which terminate with the beginning of high temperature. The wind could pick up refuse and dump or scatter it else where if refuse is not properly manage.

1.8.4 DRAINAGE

Before t he devastating floods of September, 1986 in Minna there were poor drainage system most of the existing drainage network prior to the floods of 1986 were either in adequate or non functional. The construction of large multi million Naira modern drainage systems across Minna has

reduced, to the barest minimum, the incidents of flooding in Minna. It is therefore necessary to manage solid waste in order to prevent the blockage of drainages that could lead to flooding which will affect the property values.

1.8.5 LAND USE

The land in Minna is essentially used for agricultural purposes. Within Minna township crops like Maize, Melon, Groundnuts are produced. Vegetable gardens are also maintain near some house holds. The largest percentage of the land is used to build residential houses to accommodate the rising population. Considerable percentage of land is also use for building both Government and private office blocks. A

reasonable percentage of land area is also used to build township roads for ease of movement. The hygienic nature of land is however not preserve since there is indiscriminate defecation and dumping of all sort of wastes everywhere.

1.8.6 VEGETATION

The vegetation of Minna belongs to the Guinea Savanna vegetation. The vegetation is characterized by tall grasses with scattered trees like locust beans, sheabutter and mango trees etc. Several years of repeated cultivation as rendered the land almost bare. Instead of tall fresh grasses we now have short scanty and miserable looking grasses with almost all the tall trees cut down for use as fuel wood. Vegetation of the study area

will not pose trees to solid waste management and property values.

1.8.7 SOIL

The surface soil in Minna is generally loamy sand. The soil is well drained and has high water infiltration rate. Soil of Minna are derived from basement complex rocks. They range from sallow to very deep soil over laying weathered geneses and magnettes. Some are under lain by iron pan at varying depths. They are strong brown to red sandy clay or clay with often gravely loamy sand or sandy surface layers.

1.9 ORGANISATION OF THE PROJECT

This research work has been carried out to asses the relationship between environmental sanitation and property values. The project work has been divided into five chapters.

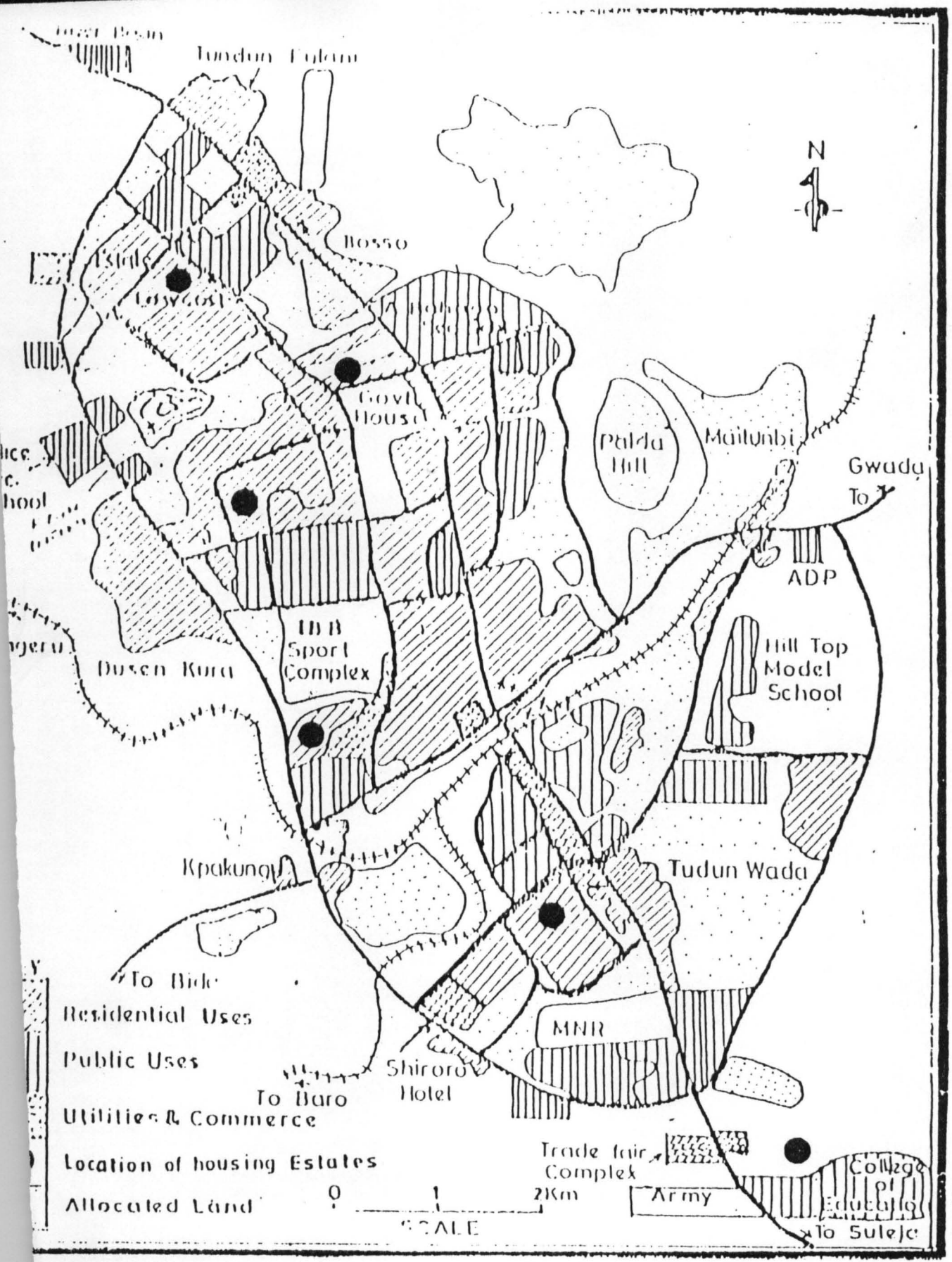
Chapter one being an introductory Chapter, highlight the aim and objectives of the study area, scope of the study and give general introduction of the dissertation.

Chapter two deals with the reviewing of various text books, relevant to the subject matter of the research work.

Chapter three deals with the methodology employed in gathering data for the dissertation.

Chapter four deals with summary of finishing's, Recommendation to overcome the problem and conclusion.

The next chapter will be the literature review.



Source : Survey Department, Minna With Modification

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 CONCEPT OF ENVIRONMENTAL SANITATION

Environmental sanitation is the control of all those factors in man's physical environment which exercise or may exercise deleterious effect on physical, mental and social well being (WHO). Similarly, the world book Encyclopedia defined it as the science controlling man's surrounding to promote health and comfort, or the process of taming the environment so that it no longer constitutes health hazard to man and in order to change or enhance his physical, mental and social well being.

For effective management of refuse and good sanitary environment, various successive

governments have been formulating policies, have spent money and time to achieve this. Among such efforts was the launching of fifth phase of War Against Indiscipline in 1984 that introduced weekly environmental sanitation. During the launching, General Idiagbon acknowledged the effort of waste management and commented that a dirty environment contributed significantly to high mortality rate particularly among children. Another effort was the establishment of Government agencies to deal with solid waste. For example Lagos State Waste Disposal Board for solid waste management was established in 1980, Federal Environmental Protection Agency (FEPA) (1988) Niger State Urban Development Board NUDB (1998).

2.2 WASTE GENERATION

There are certain factors that determine the rate and character of waste generated. These include the level of economic activities, the pattern of consumption and income level, to some extent culture, population size and level of economic development, however, personal income has been found to have the most significant effort on waste generating due to its impact on individual consumption pattern. It has been noted that the rate of solid waste generation per capita increases as the standard of living improves (UNCHS Habitat 1984). Also the global average of waste generation as complied by the world bank clearly show the relationship between those of how income countries (0.4 and 0.6

kilogram / per capita / per day) and for industrialized countries (between 0.7 and 1.8 kilogram/per capita/per day). Studies in some Nigerian settlements have also indicated the variations between high income house holds in the low density part of settlement and low income house holds. The national average per capita waste generation is estimated at 0.45 kilogram per capita per day.

2.3 CONCEPT OF SOLID WASTE MANAGEMENT

The healthy living of an individual depends solids on aesthetic and healthy nature of the environment he/she lives in because of the influence it has on his physical, social and emotional health. A good sanitary environment

ensures emotional well-being, beautiful scenery, clean and orderly society (Yabagi, 1996). But man in his iteration with the environment most especially axes with population concentration, has not been able to keep an aesthetic and healthy environment.

This was due to generation, concentration and inadequate management of waste that has been on increase.

Waste according to Berry et. al (1974) is any unwanted thing that are injurious to human health or undesirable materials that originated from industrials, mining project, agricultural as well as from residential, commercial and municipal uses of the urban areas. May (1974) also defined waste as any gaseous, liquid or solid material that is

thrown away because it has no further use by the owner. Of all the waste types solid waste is the most problematic as it can be found in our cities littering the streets, obstructing roads and drainage, polluting the environment and constituting a public health hazard. Between one-third and half of the city trash goes to uncollected.

Solid waste management objective according to Okpala (1986) is to collect, transport, treat and finally disposed off the waste in a hygienic and authentically acceptable manner at the lowest possible costs.

Similarly Ademiliupi and Kent (1988) saw waste management scope as the elimination, minimizing, reduction, identification, separation, segregation, collection storage, transportation

disposal treatment, sales and recycling of waste of quantities, composition, destination and proof of disposal.

2.4 Regular monitoring and audit of waste management activities is also included. To this end, Savas (1979) opined that solid waste management centered around how to remove the waste, how to assure compliance on the past of all citizens and who should perform these duties and how to pay for them. Solid Waste Disposal

Solid waste (SW) disposal is the removal of refuse from where it was generated to a place of disposal. Disposal of solid waste can be said to have been made when it is collected, transported, treated and disposed of to a place where it may not constitute environmental

menace/problems. The necessity for proper solid waste collection and disposal stem from the concern that improperly stored or treated waste can feed and bread disease bearing pests (Rats, flies, mosquitoes, etc.) and endanger public health.

Refuse collection is the primary purpose of refuse removal and disposal of solid waste especially garbage to minimize the possibility of disease and to reduce the effect of littering the environment and pollution. But the attitude of inhabitants in keeping good environment may contribute to the pilling of refuse. Hence, Molly O'Meara (1999) observes that remains from some of the earliest cities suggests that residents at first look a 'devil may care' approach to solid disposal, simply raising the roof of their houses as mounting garbage lifted street levels. Similarly Anderson (1973) stated that the sheer volume in a year can develop to a mountain stock pile.

He added that, if each years waste accumulated in a period of two (2) years a community will be buried by its own waste product finally Nsan (1984) said that if the present poor attitude of environmental sanitation remains unchanged. Nigeria would need about N1.36 billion annually to clear the mountain of refuse which would have built up in the country.

From the above views, it shows the importance of adequate refuse collection and disposal. Though most of our cities are far from being free of solid waste insselberg Jehu (1999) concentrated effort is being made by all concern. To this end different method of disposal is being employed.

Most settlement has been sited to take advantage of water for human activities. These series and streams that provide drinking water are used to carry away waste most

especially household and industrial wastes. So the flow of water into a city and the flow of waste out are intimately linked (Molly O'meara, 1999). This method though still in use has its adverse effect on pollution of water and killing of aquatic lives.

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

The house to house collection methods is already in use in many cities and towns like Lagos, Kaduna, Abuja, Ibadan, Enugu. This has also been introduced in Minna by Niger State Urban Development Board (NUDB) commercial department and also accredited some private solid waste collectors like town clean, Rola holdings and

Zuwa etc. to collect and dispose of refuse from household and some commercial and business centers in Minna town.

Burning of waste or refuse is another method of solid waste disposal. In most urban cities / centres, fire is often set on mountain of refuse to reduce the size of it. It is said that burning reduces the amount of waste to between 10 – 15%. But open burning of dumping site causes air pollution which may result in respiratory diseases.

2.5 SOLID WASTE TREATMENT

As earlier stated, the treatment of solid waste involves collection, transportation, processing and disposal. Solid waste should be viewed as a resource when considered against the background that salvaging various

components in the waste can help offset cost of collection, treatment and disposal operations.

Some industrial wastes are very harmful. So collection should be done with gloves, nose mask and all other safety precautions. The heaping of the waste should take into consideration the possibility of harmful exposure and potential of atmosphere pollution. For solid harmless waste, the storage should in short concrete wall, organic waste should be stored in thick containers with little or no exposure to the atmosphere.

For toxic waste, Extra caution should be taken during collection and storage. Storage should be in air tight containers and vacuum sealed. Transportation of the waste to the treatment and disposal centres should be done promptly. This is always carried out in appropriate vehicle such as recovery vehicles / van, tipper dinosaur

bulk container vehicle etc. These are often complemented with a mobile workshop to provide maintenance services. (Author, Year).

2.5.1 PROCESSING: The processing of the waste can best be handled when there is proper understanding of the origin, characteristics and classification of the waste.

2.5.2 COMPOSING: The biodegradable class of the waste is subject to composing. This is a process of bio-digestion of tissues and organic substances to release the bound materials, and materials thus making them available to plants for growth.

The organic fertilizer obtained from this process is used for agricultural purposes as well as for fighting desertification and soil erosion. It is rich in nutrients

unlike chemical fertilizers. It does not pollute the environment.

2.5.3 CHEMICAL METHOD OF SOLID WASTE TREATMENT

Solid waste of chemically pollution character can be treated by chemical methods. Filtration and separation method is used to separate solids from the waste medium. It could involve chemical processes before filtration, the driving force in the filtration process is a pressure gradient caused by gravity, centrifugal force, vacuum or higher than atmosphere pressure.

Other chemical methods include precipitation coagulation and clarification in which suspended solid particles can be segregated. Chemical precipitation process for toxic metal removal is implemented by the addition of a chemical precipitant to the waste and thus converts the metal into soluble forms by a chemical

reaction between the soluble compounds in the waste and the precipitant. The resultant suspended solids are separated out in clarities.

2.5.4 INCINERATION

This is a process of bringing dried solid waste through the use of flame or stream or hot gases. This is carried out in modern incinerators which are plant – like structures with provision for the removal of the by-products like ash, salvageable metal etc. This method is employed where there is sufficient land and where the chosen area, is not affected by the local weather conditions. With incineration a large volume of sludge or refuse can be reduced to a small quantity of ash reduced to a small quantity of ash which is free of organic matter and therefore used as an ingredient in the manufacture of burnt bricks, roofing sheets, cement, dyes, soap etc.

The ash equally serves for the growth of plant. The incombustible objects recovered from incineration are used for land filling or as embankments as reinforced matter. However a great disadvantage of incineration is that it leads to air pollution.

2.5.5 BARGING

This method of waste disposal is used when there is not much space and the treatment site is adjacent to a deep body of flowing water usually an ocean. Here the raw precipitated or digested solid waste are dumped into waiting barge or ship when the barge is fully loaded, it transports the waste to a suitable site far from shores where it is discharging usually by pumping it out deep under the surface of the water.

This technique is employed when waste drying or treatment is cumbersome and expensive.

The advantages of this method include reduced land demand, and low operation of receiving water course.

2.5.6 SANITARY LAND FILL

This is an easy method of disposal of industrial and municipal solid waste on land by spreading the waste in thin layers, compacting them to the smallest practical volume and covering them with earth in a way that protect the environment. Here there is no need to segregate the waste into the different components.

There are two basic land fill techniques. These are the trench techniques which involves spreading and compacting of waste in an excavated land. This is employed where the soil is more than four metres, and

the area technique which involves spreading of the waste on a natural surface of the ground the subsequently compacting with layers of earth.

Land are remote from human habitations are selected for land fill purposes such that fears of well water contamination are allayed.

One big problem with land fill is that as a result of layering and compacting an anaerobic atmosphere is enerated inside the land fill and this gives rise to methane gas production. If gas is not released, it can lead to an explosion of the site. Hence during the preparation of the site horizontal network of pipes is laid to collect the methane gas to a vertical pipe at the end of which the gas is burnt off periodically. Land fill is a very hygienic way of solid waste disposal.

2.6 PROBLEMS OF SOLID WASTE MANAGEMENT

The securing issues of sold waste management then, are how to remove the wastes, how to ensure compliance on the part of all citizens, who should perform those duties and how to pay them (Savas 1977) solid waste collection, transportation, and disposal in Nigeria are generally ineffective or non-existent. It is poorly administered with little clear definition of functional authorities, performance, operational coordination and financial accountability. (USEPA, 1979).

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

The people's attitude of dumping refuse indiscriminately is a major problem of solid waste management. Adults and children charged with emptying of household refuse often does that inadequately. Some empty the waste container some metres away from there houses, some in near by drainages. Yet others near the community deposits. This poor sanitary habit and attitudes, Egunjobi (1985) stated that we must not under estimate the role of habit and attitude of people in keeping a sanitary environment. This brings to mind, Environmental Sanitation Task Force constituted by the federal Military Government in 1984 after launching of WAI fifth phase. The essence is to inculcate a sanitary habits in every Nigerians. Ogasi (1984) cautioned that the regulation may not achieve much success if people fail to appreciate the need for a clean environmental.

Inadequacy of waste disposal facilities in our cities compounded more problems, the facilities provided on either communal deports or incinerator are over-stretched by the growing number of people. (Kule et al 1986), stated that rapid growth of urban population means that many cities have now over flow their boundries. Consequently, it is difficult for the cities authorities to plan properly for urban services provision and urban development.

Solid waste management or urban environmental management in Nigeria is characterized by consistency in organizational and administrative structures. Constitutionally solid waste management is a responsibility of municipal or local government council, but in all state of the federation, today, boards, agencies and some authorities have been created for the same purpose. For example in the area of study (Minna) the

Local Government have its workers responsible for sanitary, then came the various task forces on Environmental Sanitation by the then successfully military governments before the establishment of Niger State Environmental Protection Agency (NISEPA), and new Niger State Urban Development Board (NUDB). Their functions overlap and often staff from one agency moves to another. This collaborates mid 1995 report on solid waste that "there is no proper management organization to deal with the problem of solid waste and there is no agency specifically and wholly vested with the function of solid waste management (Jehu 1999).

In similar report USEPA (1979) with specific reference to Lagos metropolitant area observed that the present inefficient system will be further compounded by the fragmentation of responsibility for refuse collection and disposal of metropolitant are among several local bodies"

Okpala (1986) observed that about the greatest constraint or the way of effective and quality of solid waste management is the inadequate financing of the process, on funding Lagos State.

The environmental report 1995 admitted the inability of the government to fund the programme adequately due to scarce resources, hence the 10 years programme (1991 – 2001) on environmental management that has been estimated to cost about 60 million per annum, in 1995 the state made budgetary allocation of only 34 million Naira to cover capital, special and current expenditures which is inadequate as compared to the programme.

From the above assertions, it shows that non-governmental agencies (NGO) and environmental friendly individuals should come into the programme.

Despite the proliferation of Urban cities environmental and solid waste management agencies in our cities, they lack technical manpower and machines, are inadequate and almost broken down. In fact most of the machines are imported.

Kunle et al (1986) comment that the introduction of the high technology for solid waste management by the public sector in itself is questionable, considering the poor maintenance and spare part replacements, in the face of more appropriate ones, like wheel barrows, hand cart, small tippes and animals.

To sum up the problems Jehu (1999) said that existing governmental agencies responsible for solid waste management suffer from a group of related problems such as lack of technical power, fund and equipment.

2.7 CONCEPT OF PROPERTY

Property, in conventional business transaction is any improvement such as buildings, installation or any form of structure erected below and over land (Babatunde 1997 p.2)

Encyclopedia Americana (1981 Vol. 22 p. 540) described property as the :interest, benefits and rights inherent in the ownership of the physical real estate".

In valuation some estate surveyors simply refer to property as land and buildings. It is therefore not surprising when Yahaya (1993 p. 40) conceded that property is the subject matter of ownership that anything which belongs to a person given the exclusive right to enjoy a thing, example being land and building.

Thorncroft (1970) defined property as a complicated concept which consist not only the object owned by a persons, but rather of mans right.

2.8 CONCEPT OF VALUES

Value if a borrowed term from latin word "Valare", the concept of which is so diverse, encompassing various human endeavors, depending on the perspective from which t is observed. The term value according to International Encyclopedia of the Social Sciences (Vol. 16 p. 288), may refer to interest, pleasures, likes, preferences, duties, moral obligations, attractions and many other modalities of selected orientations.

Alfred Marshal in Pearce (1981) advanced the concept of value as "market price, which is determined by the

interaction of the forces of demand and supply, both of which are derived from principle of utility.

Britton et al (1989) sees that market value or market price of a particular interest in landed property as "the amount of money which can be obtained from the interest at a particular time from person able and willing to purchase it".

However, Llyod in I. E. S. S(vol. 16, p. 237), noted that "the term value does not express a quality inherent in a commodity but a feeling of the mind, and its variable with the variation of the intrinsic qualities of the commodity which is the object of it.

American institute of Real Estate Appraisers (1974), interpreted and summarized that "value is not a real property itself, but depend on the desire of man. It varies

from person to person and from time to time, as individual desire varies. An object cannot have value unless it has utility, and utility arouses desire for possession and has power to give satisfaction, utility alone does not give an object value, it most also be relatively scarce". So utility and scarcity are two of the element creating value. Utility confer values, unless they arouse the desire of a purchaser who have the purchasing power to buy. Oliver Wandell Holmes in A. I. R. E. A(1974) placed emphasis that he word value if a word of many meanings because it is the symbol of idea and cannot be defined precisely.

In his words "A word value if not a crystal, transparent and unchanged, it is the skin of a living thought, and may vary greatly in colour and content according to the circumstances and the time in which t is use".

2.9 VALUE THEORIES

From the time of Aristotle until the middle of the 16th century, the views expressed on value were often incidental of other subject. Therefore, value theories were accorded greater consideration by economic theorist. (American Institute of Real Appraisal 1974).

2.9.1 THEORIES OF MACHANTALIST

The machantalist believed that individual economic well being was possible only on a strong economic state. This require strict control of productive agencies, particularly land and the means of transportation. They approach a clear analysis of subjective value when they considered "desire" as a factor of value. Land has no cost of production, yet it was valuable because people desire it. However, their

contribution was in the field of value in their consideration of price or value in exchange. They were interested in competition and its effect on price. (A.I.R.E.A)

2.9.2 THEORIES OF PHYSIOCRATS

A group of philosophers known as the Physiocrats further added to economic theory by laying the foundation for today' concept of economic rent. They held that "only land contributes anything in excess of production cost, and the wealth has no value beyond the possibility of exchange. The stress land as the elemental productive agent, yet failed to give proper credit to industry and commerce as equally potent in the production of wealth A.I.R.E.A..

2.10 TYPES OF VALUES

Although value is really symbol of ideas and cannot be defined precisely, in real estate decision making, it has been broadly divided into two viz:

1. Value – in Exchange.
2. Value – in Use.

Value in Exchange: This is the power of a good or commodity to command other goods or commodities in exchange. It is also known as "market value". American Institute of Real Estate Appraisals (1967) defined market value as:

a. The highest price estimated in terms of money which a property will bring if exposed for sale in an open market, allowing a reasonable time to find a purchaser who buys with knowledge of all the uses to which it is adapted and for which it is capable of being used.

b. The price at which a seller would sell and willing buyer would buy neither being under abnormal pressure.

c. The price expectable if a reasonable time is allowed to find a purchaser and if both seller and prospective buyer are fully informed. It is suffice to note that market value is also referred to as capital value.

Value in use: This refers to the worth of all benefits anticipated from ownership right in real estate to typical users (Rancich M. I, 1970). Value in use computation according to A. I. R. E. a. (1974) is generally appropriate when:

1. The property is fulfilling an economic demand for the service it provides or which it houses.
2. The property improvement have a remaining economic life expectancy.

3. There is reasonable ownership and competent management.
4. Diversion of the property to an alternative use would not be economically feasible.
5. Continuation of existing use by present or similar occupants is assumed.

Other types of value identify by Goldberg M. A. (1992) includes

2.10. 1 NORMAL VALUE: which is the average of trend of price over a long period of time. It accounts for the practice of taken a market range of prices for a considerable period of time before and after the date of valuation.

2.10.2 GOING CONCERN VALUE: This is the value of land, building, plant and machinery in the land of the

purchaser acquiring them as part of the business for which they are designed and used. Such purchaser will have regard to the amount of the profit, which he would make out of the business.

2.10.3 CURRENT USE VALUE: This is the market value, which a piece of land attracts under its current use.

2.10.4 DEVELOPMENT VALUE: Rental value of a landed property in a broad sense is the periodic income stream receivable by a willing lessor from a willing an able lessee in consideration for a lease.

2.11 DETERMINANTS OF REAL PROPERTIES VALUE

Lean and Godall (1966) discussed some factors that determine landed properties value in an area. These include:

i. LOCATION: Lean Godall (Ibid) demonstrated that if two real properties which are identical in all aspects, having the same building layout of surrounding land, and one has a market price higher then the other, then the difference in the market price of the two properties must be due to difference in their relative position.

ii. MARKET PRICE: The market price of the developed real properties also determines land value. If the developer – acquiring the two plots in the above demonstration wishes to build the two buildings, assuming his building costs etc. are the same in both cases, he would be willing to pay more for the one sited than the other up to the difference in the market price of the developed properties.

iii. REDEVELOPMENT POTENTIAL: If land already developed has redevelopment potential, the redevelopment potential will determine the value of the property rather than the existing use. If a developer can see that could make an adequate profit by demolishing the existing structure and erecting a new one for the real property than the present users.

iv. ACCESSIBILITY AND COMPLIMENTARY: The greater the accessibility and the complimentary advantages the greater the value of the real property.

v. CAPITAL IMPROVEMENT: Capital improvements in the way of roads and building can increase the potential value of a particular property.

vi. DEMAND AND SUPPLY: It has been stated that accessibility and complimentary increase the usefulness of properties to potential users, thereby increasing the demand. In economic literature emphasis is placed on the important of demand in determining the value of developed real property and hence the value of land. This is because land is seen as being fixed in supply, and where there is a fixed supply of any commodity the price of that commodity will be very sensitive to changes in demand. Therefore, if demand falls, property value will also rise accordingly.

vii. POPULATION DISTRIBUTION: Population plays an important role in the demand and supply for landed properties. As population increases there is need for more accommodation and need

for accommodation is need for space. Therefore, rising population implies more demand for accommodation and the result is rising property value.

2.12 EFFECT OF SOLID WASTE ON PROPERTY VALUES

The real cost on society of dumping industrial or domestic waste may be very much greater than the costs usually assigned/charged (Henstock ME, 1995). The indiscriminate dumping of refuse has a significant effect on the value of properties in such a neighbourhood. The way and how is here under examined.

i. Odour:- Refuse dump has been known to generate offensive odour. The effect of this is that most properties in such neibourhood has been deserted in recent past, the implication of this is that the properties are left to lie void for year, there by reducing the property values structural wise and rent wise.

ii. Insects:- The transmission route of sanitation induced diseases such as malaria, cough, cholera, dysentery, diarrhoea and a host of others are largely brought about by insects such as flies, mosquitoes and other insects the take the refuse dumps as their breeding ground. An environment of this nature is not always conducive for living, and hence, the property value there in is nothing to write home about.

iii ENVIRONMENTAL DEGRADATION: Huge dumps of refuse and indiscriminate manner in which people tip refuse has become eyesore to members of the public. It destroys the scenery of the environment. It also becomes a source of psychological disorder. The degraded environment is not attractive to property investor,

and the little that might be there may not command appreciative value.

iv. ATMOSPHERE 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 positive can be located from a distance. Apart from the particulate matter that constitute smoke, gaseous dsischarge from incomplete combustion may include sulphurdioxide (SO_2), nitrous oxides and various other noxious oxides which are dangerous to health.

A neighbourhood with a track record of this is not attractive to habitation. In the same vein property located close to industrial site often suffers serious set back in terms of value. This is because the emission generated from industrial engines is injurious to health and the

vibration there from also has a significant effect on the lives of the people. Dele (1999).

Conclusively, the essence of the literature review is to highlight areas that will be exploited in the research methodology which the succeeding chapter has taken care of.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY AND PROCEDURES

This study was carried out to find out the problems of environmental sanitation and its influence on property values in Minna metropolis as the case study. For systematic collection and analysis of necessary data towards the study the following procedure was employed.

3.1 RESEARCH METHOD

To obtain information which allowed for in-depth study of state of solid waste management and its influence on property values in Minna metropolis, the researcher employed descriptive survey method. This method allowed for information to be sourced concerning the current status, phenomena, or happenings. Descriptive survey method is used because it describe,

interprets and is concerned with conditional relationship that exist, opinions that are held evidence of effects current developing trends

3.2 SAMPLE AND SAMPLE TECHNIQUE

As all inhabitants of Minna cannot be reached, the researcher selected randomly a total number of eighty (80) respondents to administer questionnaire on. The respondents were either the head of the house hold and practicing estate surveyors and valuers and where neither of them was available an adult who may be familiar or has sufficient knowledge about the research topic was given the questionnaire.

Also from the numbers of neighbourhood in Minna, four (4) were randomly selected from which the respondents were selected. A total of twenty (20) questionnaires were administered.

3.3 PROCEDURE FOR DATA COLLECTION

In collection of information and accessory data, the researcher instruments used in descriptive survey studies.

3.3.1 PRIMARY DATA

Primary sources of data collection has been observed to be a source of first hand data. It provide the researcher data that are directly related to his interest. In this light, the following methods were employed:

i. Field surveyed / personal interviews.

ii. Questionnaire.

3.3.1.1 FIELD SURVEY / PERSONAL INTERVIEWS

This type of data collection provided the researcher the opportunity of getting firsthand information. In this, field survey observations were made on how to assess the relationship between

sanitation and property values, oral interviews were held with head of household, practicing estate surveyors and valuers. Also, interviews were conducted with individuals directly involved in the management of our environment and sanitary issues. The people interviewed where staff of the agency concerned with environmental issues. Such agencies include the Niger State Environmental Protection Agency (NISEPA), Niger Urban Development Board, (NUDB) and the Primary Health Care Department (PHC) of the Local Council. The people interviewed were carefully chosen in random form to ensure validity of information relieved.

3.3.1.2 QUESTIONNAIRE

The objective of this method of data collection was to answer specific questions. In this regard, two sets of questionnaire were design, one each to head of household and practicing estate surveyors and valuers.

3.3.2 SECONDARY DATA

This source of data collection served the useful purpose of providing the researcher with literature of various authors who at one time or the other wrote on similar subjects or topics. In this regard, the researcher consulted relevant textbooks, thesis, journals, monographs, seminar papers, newspapers, reports, and other published and unpublished materials on environmental sanitation, solid waste and property values. These data were sourced and reviewed in chapter two as literature review before the collection of primary data.

3.3.3 RECONNAISSANCE SURVEY

An extensive personal observation was undertaken with a view of making inventory of existing condition and assembling of background data of sampling areas in

Minna metropolis. These include the assessment of the environmental sanitation level of the neighbourhood, dumping sites, the state of buildings conditions, the mobility of people and their activities around the neighbourhood and how it related to property values.

3.4 DATA ANALYSIS

For easy analysis of data, a two dimensional representation of statistical information (table) was drawn. The table was meant for the completed questionnaire forms received from the respondents. The responses were coded and fed into tables. The descriptive statistics of frequency and percentages were used for final analysis.

Thus, statistical methods used, the analysis therefore include:

i. Frequency count or number distribution along the alternatives provided for the respondents to choose form.

ii. The frequently distribution summarized into table were converted into percentages for easy usage in the analysis.

iii Factor analysis using SPSS computer software to check correlation.

3.5 LIMITATION

There is no project work without limitation as a results, in the course of this study, the constraint being faced by the researcher are as follows:

Finance is a major problem in this instance, the researcher has to go back for the questionnaires which were not forth coming, this lead to over consumption of the little at hand. Another problem is with the distribution and collection of questionnaire involved, the respondent were not willing to release the information at their disposal. The third problem is that of time which is

too short for the dissertation, coupled with that of class activities and study.

The succeeding chapter is the data analysis and presentation, in this chapter all the primary data collected are analysed and presented for easy usage.

PLATE 1: A typical solid wastes dumping site in Minna. The growing heap of solid wastes is not only threatening to completely block the passage over the bridge but also could block the drainage system below it.

PLATE 2: This is another solid wastes dumping site in Minna. The wastes are scattered all over the area. Smoke nuisance is also visible due to the burning of the wastes. Goats are also seen here eating from the food wastes.

Plate 3: A coomunal solid wastes depot in Kpakungu with a disuesed Roll-on-Roll-off Refuse collection bin-Refuse is indiscriminately dumped on the site.

Plate 4: A typical waste dumping site within residential neighbourhood.

PLATE 5. A section of modern drainage system in Minna. Note the presence of refuse on both sides of the embankment. The refuse is also seen falling into the drainage. Also to be noted is the accumulation of wastes and the growth of weeds inside the drainage fertilized by the falling wastes.

CHAPTER FOUR

4.0 DATA ANALYSIS AND PRESENTATION

This chapter deals with analysis of data and discussion of findings.

A total of eighty (80) questionnaires were administered out of whom seventy six (76) were successfully attempted and returned.

In the analysis of data, simple frequency and percentages were used, factor analysis using SPSS Computer software was also used.

TABLE 4.1: TYPES OF WASTE GENERATION

Response	Frequency Distribution	Percentages
Paper	13	17.1%
Food Particles	20	26.3%
Polythene bags	25	32.9%
Tins and Cans	10	13.2%
Others	8	10.5%
Total	76	100%

SOURCE: AUTHORS FIELD SURVEY 2002

Among the households waste generated in the study area, polythene bags generated from pure water, sobo drinks and other commodities were most generated. About 33% of the respondents indicate that waste from polythene bags a more generated. This was followed by food particles which about 26% of the respondents indicates. About 17% of the respondents indicate papers while tins and cans and others were reported by 11% of the respondents.

Attempts was made to know means of storing waste. (See table 4.2)

TABLE 4.2: MEANS OF WASTE STORAGE

Response	Frequency Distribution	Percentages
Bag	10	13.1%
Drum	25	32.9%
Bucket	35	46.1%
Dustbin	6	7.9%
Total	76	100%

SOURCE: AUTHORS FIELD SURVEY 2002

Waste generated in the study area are largely stored in the bucket before depositing at the dumping site. About 46% of the respondent store waste in the bucket. Then followed by the use of drums, it is shown that about 33% of the respondents used drums to store their waste before depositing at the dumping site. Then followed by bag and dust bin with 13% and 8% respectively.

The means of waste disposal by households are shown in table 4.3

TABLE 4.3: METHOD OF WASTE DISPOSAL

Response	Frequency Distribution	Percentages
Throwing into streets	13	17.1%
Throwing into drainages	20	26.3%
Dumping at dumping site and disposal by government and their agencies	43	56.6%
Incinerator	0	0%
Total	76	100%

SOURCE: AUTHORS FIELD SURVEY 2002

The table indicates the various ways of disposing household waste in the study are. Incinerator is not in use as non of the respondents indicates its use. From the reconnaissance survey carried out by the incinerators were built by government in previous year but are no more in existence; then there even few in use by Private individuals or organizations such as Horizon College Minna

About 17% of the respondents threw waste into the street, while 26% of the respondents threw waste into the drainage. This often blocked drainage that is wide enough. In fact, even multi-million Naira modern drainage constructed by the government is not spare for such menace. But 57% of the respondents carried their waste to the dumping sit and disposal by government and its agencies.

From the above presentation is not out of place to say that open dumping is being practiced in Minna.

Frequency of waste disposal as shown in table 4.4

TABLE 4.4: FREQUENCY OF WASTE DISPOSAL

Response	Frequency Distribution	Percentages
Very often	0	0
Often	45	59.2%
Not often	31	40.8%
Not at all	0	0
Total	76	100%

SOURCE: AUTHORS FIELD SURVEY 2002

Table 4.4 provides information on how often or otherwise refuse are being collected from the available or designated dumping sites across the study area. From survey findings it is seen that 59% of the respondents indicated that the agency (NUDB) often evacuate refuse from the dumping site, while 41% were of the opinion

that there work was not often. Very often and not at all were rejected by the respondents.

But at the time of this study NUDB, the agency responsible for collection did its best by evacuating heaps of waste that are dumped in the sites to minimize health hazard within the neighbourhoods.

Frequency of sanitation exercise by households is as shown in table 4.5 below

TABLE 4.5: FREQUENCY OF SANITATION EXERCISE BY HOUSEHOLDS

Response	Frequency Distribution	Percentages
Daily Weekly Monthly	0 20 56	0 26.3% 73.7
Total	76	100%

SOURCE: AUTHORS FIELD SURVEY 2002

Table 4.5 indicates that about 26% of the respondents carryout sanitation exercise weekly, while 74% of the respondents carryout their sanitation exercise monthly and the reported by the respondents. This will lead to poor sanitary condition of the study area which will have more effect on health of the populace, and it exert much influence on property values.

Frequency of visit by sanitary inspectors (see table 4.6)

TABLE 4.6: FREQUENCY OF VISITS BY SANITARY INSPECTORS

Response	Frequency Distribution	Percentages
Daily	0	0
Weekly	2	2.6%
Monthly	4	5.3%
Not at all	70	92.1%
Total	76	100%

SOURCE: AUTHORS FIELD SURVEY 2002

About 92% of the respondents shows that sanitary inspectors don't visit their houses at all. About 5% of the respondents indicate that sanitary inspectors do visit their houses monthly to inspect the level of sanitation and to encourage and advise them where necessary, they even penalized offenders or defaulters. About 3% of the respondents its shows that sanitary inspectors visit and inspect their houses weekly.

TABLE 4.7: KITCHEN FACILITIES

Response	Frequency Distribution	Percentages
Yes	36	47.4%
No	40	52.6%
Total	76	100%

SOURCE: AUTHORS FIELD SURVEY 2002

The largest number of the respondents constituting 53% do not have kitchen in their houses, while about 47% do have. Those properties with kitchen will attract higher value than those without kitchen.

Attempt has also been made to see whether there is toilet facilities within houses in the study area (see table 4.8)

TABLE 4.8: TOILET FACILITY

Response	Frequency Distribution	Percentages
Yes	50	66%
No	26	34%
Total	76	100%

SOURCE: AUTHORS FIELD SURVEY 2002

Table 4.8 shows that about 66% of the respondents have toilet facilities in their houses, while about 34% of the respondents do not have toilet facilities in their houses, they usually defecate in the nearby bush around their houses which unhygienic and will reduce the level of sanitation within the neighbourhoods. This may cause health hazard values. Houses with toilet will command a higher value than those without toilets.

The types of toilet facilities (see table 4.9)

TABLE 4.9: TYPES OF TOILET FACILITY

Response	Frequency Distribution	Percentages
Water Closet System Pit Latrine Bucket Latrine	12 30 8	24% 60% 16%
Total	76	100%

SOURCE: AUTHORS FIELD SURVEY 2002

In table 4.9 it is seen that 24% of the respondents use water closet system in their houses which enhance level of sanitation, properties with such type of toilet facility attract higher value the others with pit latrine and bucket toilets.

About 60% of the respondents uses pt latrine in their houses and about 16% have bucket system latrine.

An attempt have also been made to see if there is drainage within the houses (see table 4.10)

TABLE 4.10: DRAINAGE WITHIN HOUSES

Response	Frequency Distribution	Percentages
Yes	41	54%
No	35	46%
Total	76	100%

SOURCE: AUTHORS FIELD SURVEY 2002

Table 4.10 shows that 54% of the respondents have constructed drainage to drain sewage from their houses, while 46% do not have. This will lead to over flow of sewage water thereby causing foul odour within the neighbourhood and will serve as breeding grounds for mosquitoes.

In the types of drainage within houses (see Table 4.11)

TABLE 4.11: TYPES OF DRAINAGE WITHIN HOUSES

Response	Frequency Distribution	Percentages
Open Drainage	30	73%
Close Drainage	11	37%
Total	76	100%

SOURCE: AUTHORS FIELD SURVEY 2002

Table 4.11 shows that about 74% of the respondents have open drainage to drain sewage water from their houses, while 27% of the respondent use close drainage.

Attempt has been made to score the neighbourhood sanitation by residents (see table 4.12)

TABLE 4.12: SCORING OF NEIGHBOURHOOD SANITATION BY RESIDENTS

Response	Kpakungu	Anguwan Kaje	Tunga	GRA
Very Good	0 (0%)	0 (0%)	2 (10%)	10 (52%)
Good	4 (21%)	0 (0%)	8 (40%)	5 (26%)
Fair	3 (16%)	2 (11%)	6 (30%)	3 (16%)
Poor	10 (53%)	4 (22%)	3 (15%)	1 (5%)
Very Poor	2 (11%)	12 (67%)	1 (5%)	0 (0%)
Total	19 (100%)	18 (100%)	20 (100%)	19 (100%)

SOURCE: AUTHORS FIELD SURVEY 2002

Table 4.12 shows that the score of environmental sanitation of neighbourhood by residents.

In Kpakungu area non of the respondent score the level of sanitation in their neighbourhood as very good, about 21% of the respondents score the level of sanitation of the neighbourhood as good, while about 16% of the respondents score it as fair, then 52% of the respondents score the level of sanitation as poor and about 11% score the neighbourhood as poor.

In Unguwan Kaje non of the respondents score the environmental sanitation level of their neighbour as very good and good respectively. About 11% of the respondent score the neighbourhood sanitation level as fair, then 22% of the respondent score the level of sanitation as poor, while 67% of the respondents core the level of sanitation in their neighbourhood as very poor,

properties in this type of neighbourhood attract low values.

While in Tunga area about 10% of the respondents score the sanitation level of the area as very good, about 30% of the respondents score the level of sanitation as fair, about 15% of the respondents score the neighbourhood sanitation level as poor and about 5% of the respondents score the level of sanitation as very poor. Going by this, properties located within this neighbourhood are said to be with favorable appreciative values.

n GRA as shown in table 4.12 52% of the nts score the sanitation level of the hood as very good, about 26% of the score the level of sanitation as good while f the respondents score the environmental

sanitation level in the area as fair, then 5% of the respondents score the neighbourhood to be poor and non of the respondents score the sanitation as very poor. Properties located within GRA area attracts higher value than those located at other neighbourhood, because the level of sanitation in GRA is also high. It is seen that the perception of the people approximates what we usually observe on the ground.

The next table is the environmental sanitation level . quality of the neighbourhood in the study.

TABLE 4.13.1: ENVIRONMENTAL SANITATION LEVEL / QUALITY SCORE OF NEIGHBOURHOODS.

Description of Environmental Quality	Value	Kpakungu		Anguwan Kaje		Tunga		GRA	
		Response	Score	Response	Score	Response	Score	Response	Score
Very Good	1	0	0	0	0	2	2	10	10
Good	2	4	8	0	0	8	16	5	10
Fair	3	3	9	2	6	6	18	3	9
Poor	4	10	40	4	16	3	12	1	4
Very Poor	5	2	10	12	60	1	5	0	0
Total Environmental Score			67		72		53		34
Average Score			13.4		14.5		10.6		6.8

SOURCE: AUTHORS FIELD SURVEY 2002

Table 4.13.1 shows the environmental sanitation level / quality scores of neighbourhood in which value ·een attached to the description of environmental K An on quality. There was then multiplied by the Tur GR SO(of response to arrive at the score of each hood in the study area. The lower the value the vel of sanitation / quality of the environment. has b sanitati io number neighbour

Also two bedroom flat in Kpakungu area is about N40, 000 pa, in Anguwan Kaje is about N30, 000 pa, in Tunga is about, N50, 000 and in GRA is N65, 000 pa respectively. Four bedroom flat in Kpakungu is about N50, 000 pa, n Tunga is N100, 000 and in GRA is about N120, 000 pa. A shop measuring 4m x 5m in Kpakungu area is about N17, 000pa, in Anguwan Kaje is about N14, 000 pa, in Tunga area is about N24, 000 and in GRA N30, 000pa respectively. This is because of variation in the level of environmental sanitation among the neighbourhoods. The level of sanitation in Anguwam Kaje is nothing to write home about, while that of GRA is very encouraging.

TABLE 4.15: CAPITAL VALUE OF PROPERTIES WITHIN THE STUDY AREA

Property Types	Kpakungu (N) pa	Anguwan Kaje (N) pa	Tunga (N) pa	GRA (N) pa
A Room	80, 000	60, 000	100, 000	-
A Room and Parlour	120, 000	100, 000	200, 000	-
One Bedroom Flat	300, 000	200, 000	400, 000	600, 000
Two Bedroom Flat	500, 000	400, 000	800, 000	1, 200, 000
Three Bedroom Flat	800, 000	600, 000	1, 000, 000	1, 500, 000
Four Bedroom Flat	1, 000, 000	800, 000	1, 500, 000	2, 000, 000
A Shop (3m x 4m)	120, 000	100, 000	150, 000	200, 000
A Shop (4m x 5m)	140, 000	120, 000	170, 000	250, 000
Total Rent	3, 060, 000	1, 380, 000	4, 320, 000	5, 750, 000
Average Rent	382, 500	297, 500	540, 000	718, 750

SOURCE: AUTHOR FIELD SURVEY 2002

Table 4.15 shows the current capital value of properties within neighbourhood in the study area. It is clearly seen from the table that one bedroom flat in Kpakungu is going for about N300, 000, about N200, 000 in anguwan Kaje area, about N400, 000 in Tunga area and N600, 000 in GRA. Also four bedroom flat is about N1, 000, 000 in Kpakungu, about N800, 000 in Anguwan Kaje area, about, N1, 500, 000 in Tunga area and N2, 000, 000 in GRA.

A shop 4m x 5m is about N140, 000 in Kpakungu, about N120, 000 n Anguwan Kaje, in Tunga is about N170, 000 and in GRA is about N250,000. All this variation in capital value is as a result of the level and quality of the environmental sanitation of the neighbourhoods. Overall average mean property value is found and just shows that in table 4.16

TABLE 4.16: ENVIRONMENTAL SCORES AND AVERAGE PROPERTY VALUES

Neighbourhood	Average Rent /Neighbourhood	Average Capital Value/ Neighbourhood	Total Environmental Score	Average Environmental Score
Kpakungu	25, 700	382, 500	67	13.4
Anguwan Kaje	20, 875	297, 500	72	14.4
Tunga	41, 250	540, 000	53	10.6
GRA	51, 250	718, 750	34	8.6

SURVEY: AUTHOR FIELD SURVEY 2002

Table 4.16 shows the indices of environmental sanitation level / quality as measured by total and average environmental score.

With this factor analysis is conducted using SPSS computer software to assess/check the relationship between environmental sanitation and property values see table 4.17

TABLE 4.17: RELATIONSHIP BETWEEN ENVIRONMENTAL SANITATION AND PROPERTY VALUES

Total	Environmental Sanitation level / quality	Rent	Capital Value	Average Score
Environmental Sanitation Level/ Quality	1.00000			
Rent	-0.98421	1.00000		
Capital Value	-0.99563	0.99268		
Average Environmental Score	1.00000	-0.98421	-0.99563	1.00000

SOURCE: AUTHOR FIELD SURVEY 2002 AND SPSS COMPUTER SOFTWARE

Table 4.17 shows the correlation between the level of sanitation quality and property values. As seen on the table the correlation between total environmental score and rent is –0.98421 and with capital value it is –0.00563. The correlation between average environmental score and rent is –0.98421 and with capital value it is –0.99563. With this it shows that the relationship between environmental sanitation and property value is very high. Attempt has been made to know the significant of correlation matrix (see table 4.18).

TABLE 4.18: SIGNIFICANT OF CORRELATION MATRIX

	Total Env'tl Score	Rent	Capital Value	Average Score
Total Environmental Score				
Rent	0.00789			
Capital Value	0.0218	0.0366		
Average Score	0.0000	0.00789	0.0218	0.0000

SOURCE: AUTHOR FIELD SURVEY 2002 AND SPSS COMPUTER SOFTWARE

Table 4.18 shows the significance of the correlation between sanitation and property values. It is clearly seen that all correlations are significant. The higher the level of environmental sanitation / quality the higher the property value and the lower the level of sanitation / quality the lower the property values.

The succeeding chapter take care of the summary of findings, conclusion and recommendations

CHAPTER FIVE

5.0 SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

The outcome of data analysis and the general assessment of the study are have shown that the bulk of solid waste generated are mainly polythene bags, food particles , papers, tins and cans. The composition of the waste can be attributed to the level of income of the people that are mostly low and medium income earners.

Similarly, the solid waste generated in Minna is mostly from domestic activities with a sizeable position being from commercial activities. This may be due to the fact that Minna is not an industrial city, and most of the small scale industries are consumable.

On the storage and collection of waste from homes. Most houses use buckets in form of dust bins, drums, bags and dust bins. It is however disturbing that dustbins are not in use either by the household nor centrally by the community. This reasons contributes to the general filthy condition of the study area. If all waste are carefully stored in the dust bins whether household or community based and the waste are subsequently collected and disposed off, solid waste will not have littered every where and become an eyesore as it is now.

Most of the waste are being disposed at the open dumping sites and disposal by government agencies. Few number of the people throwing theirs into the public drainage or throwing into streets which affect the level of sanitation within the neighbourhood and tend to affect property values.

The dumping site within the study area are in a miserable states. In fact, the dumping site are eyesores. Waste are continuously dumped but not regularly collected. It is even difficult for the people who come to dump their refuse to reach the central point of dumping so the refuse is deposited any where near the dumping site. Apart from the unsightly nature of these dumping sites there is also the problem of offensive smell from the rotten materials concealed in the heaps of wastes. The smell even increase during intense heat when decomposition rate heightens. The smell makes life seriously whom for table for the inhabitant of the areas which affect the value of properties located within the dumping sites.

A very disturbing phenomenon in correction to the dumping site is the smoke nuisance. Most of the dumping sites are always on fire producing clouds of

smoke nuisance into the atmosphere. Apart from the effect of this smoke in climate change it makes the whole environment uncomfortable for living. The smoke may cause eye disturbances which may lead to more serious eye problem if exposure continuous which will tend to affect properties value within such area.

Sanitation exercise is being carried out monthly in the study area instead of weekly or daily this lead to poor sanitary condition of the study area which will have more effect on health hazard of the inhabitant of such environment and exert much influence on property values.

From the study sanitary inspection do not visit the houses to assess the level of sanitation of the area and to advice the people on the issues of environmental sanitation and also penalize defaulters who leave or

littered their surroundings so as to improve the level of sanitation within the study area, and to inculcate environmental sanitation awareness among the populace within the study area which will enhance property values and encourage more people to participate in landed property investment.

The lack of kitchen, toilet and proper drainage to drain sewage from most of the houses without kitchen, if there is any wind it will pack dust into what the people are cooking and it pose a tremendous effect to health hazard. Also lack of toilet in most deficate in the nearby bush which also tend to affect their health. The absence of proper drainage to drain sewage for the houses of the populace in the study area allowed sewage water overflow on the environment and in some cases become stagnant and will serve as breeding grounds to mosquitoes which will constitute health hazard to the

inhabitant within the neighbourhood. But houses where all this facilities are not lacking (kitchen, toilet and constructed drainage to drain sewage from houses tend to increase the level of sanitation and environmental quality of such neighbourhood and tend to increase the value of such properties.

The level of sanitation varies among neighbourhood, those neighbourhood with good level of sanitation like GRA as a result of the following factors, population, education and income level, altitude and habit of the people. It is also shows from this study that areas with high population density such as Kpakungu and Anguwan Kaje area the level of sanitation is relatively low. Properties located within these neighbourhood do attract low value because of the nature and level of sanitation / quality within the neighbourhood.

Considering the level of sanitation within the study area it is shown from the study that the rental trend per annum and the capital value of properties varies according to neighbourhood. This is as a result of the level of sanitation, the education, the income level and habit of the people and also the quality and types of properties within the study area. Properties located within GRA and Tunga area attracts higher value then those ones located at Kpakungu and Anguwan Kaje.

There is high relationship between the level of sanitation / environmental quality and property values. And also high the significance is also high between the level of sanitation and property values. The higher the level of sanitation the higher the property value and the lower the level of environmental sanitation the lower the value.

5.1 CONCLUSION AND RECOMMENDATION

The solid waste generation increases as a result of rise in population as its indicated on this study the house hold members collected waste / refuse from houses to dumpsites. Thus the researcher felt to recommend that the Government Agency or Local Government Council Environmental Sanitation Unit should make adequate arrangement with the residence in provision of dust bin and collection of waste on regular bases. Little fees can be charged on the services rendered to the public which is now on practice by commercial refuse collection unit under Waste Management and Sanitation Services Department of NUDB, Minna.

The private collection already accredited should be expanded and extended to some mini urban centres like Suleja, Bida and Kontagora.

The NUDB responsible for refuse/waste collection management disposal should be provided with enough fund, to effectively carry out its function adequately. In addition enough manpower both technical and otherwise including equipment and facilities should be provided.

Sanitation exercise should be introduced daily or weekly to inculcate environmental sanitation awareness among the people. Also sanitary inspectors should be inspecting various neighbourhood oftenly to ensure that the people have keep their environment clean; and improve the level of sanitation within the environment and prosecute defaulters accordingly.

On the attitude of habits of the people the agency in collaboration with the mass media should embark on a vigorous awareness campaign on environmental

sanitation and waste disposal. Posters should be use as well.

Considering the enormous work involved in collection and disposal of waste, and the inability of the local council to shoulder the responsibility it has been agreed that the agency responsible should be strengthened and granted more autonomy by establishing waste management board solely responsible for waste collection, management.

Also to avoid inefficiency parallel agency should be established at Local Government Council and Financial and Technical assistance required should be provided.

Finally, a set of legislation should be promulgated to check the activities and conduct of the people towards

maintaining a clean environment. The legislation should be strong enough to deal with anyone, no matter his social position, who contravene any of the environmental protection law. If all these recommendations are to be considered the level of sanitation will improve and the value of properties will also be appreciative.

REFERENCES

AMERICAN INSTITUTE OF REAL ESTATE APPRAISERS (1974). The appraisals of Real Estate: A.R.I.E.A.

ANDERSON R. AND ANDERSON O. W. (1967) Decade of Health Services, Chicago University Press Chicago.

ANDERSON, MORTON AND GREE (1978) Community Health C. V. Mostly Company St. Louis

ANGO M. ABDULLAHI (1995) Environmental Sanitation and Human Health in Nigeria, An M. Tech, Term Paper FUT, Minna.

BRITTON (1989) Modern Method of Valuation Estate, Gazette London

DANIEL B. BATKIN (1982) Environmental Studies. the earth as a living planet. Charles and Messil Publishing company, Columbus Ohio

ENCYCLOPEDIA AMERICANA (1981) Vol. 22

FRANK PRESS AND RAYMOND SIEVER (1978)

Earth Second Edition W. H. Freemen and Company, San Fracisco.

GOLDBERG M. A. (1992)

Transportation, urban land value and rent. Land Economics Vol. 46

HALILU, H. ADAMU (1991).

The Problems and prospects of Environmental Sanitation in Niger State. Unpublished work for Diploma in Environmental Health, Minna.

IDIAGBON T. (1985).

"Slum Incubators of Diseases" Daily Times Tuesday 30th July.

ILOEJE, N. P. (1981).

A New Geography of Nigeria. New Revised Edition Longman, Ikeja.

INFOTECH TODAY (1999)

Sky view publishing company.

ISAH, UMAR FARUK (1999).

Solid Waste Management Problems in Northern

Nigeria. The Pointer June 23rd 1999.

JEHU GWANI (1999).

The Problem of Solid Waste Management in Nigeria. New Nigerian Property, Friday 21st May, 1999.

KUNLE A. AGUNBIADE A. D., OGBUOZOBE J. E, ADESANYA A. D. AND ODEAGBO A. O. (1996)

Urban Population pressure and the roles of household and scavengers in solid waste management in Ibadan in Adedotun of and Ajakaye D. O. (Ed) population Environment Interaction in Nigeria NISER Studies Ibadan.

LEAN W. AND GODALL B (1973).

Aspect of Land Economics Estate Gazettes Ltd. London.

MOLLY OMEARA (1999).

Closing the water and waste circuits Word watch paper June 1999.

NDUKA OKAFOR (1984).

Aquatic and waste, Micro-biology Forth dimension publishers Enugu.

OKPALA D. C. I (1986). Institutional problems in the management of Nigerian Urban Environmental NISER Monograph, series 15 Ibadan.

OLOYEDE P. A. (2000). Man, Environment and Technology, Conference Proceedings Kaduna Polytechnic College of Environmental Studies. CES Seminar Committee (2000).

PEARCE W. D. (1981). Ed. Dictionary of Modern Economics Macmillan Press Ltd. Britain.

RANCICH M. T. (1970). Land value charges in an area undergoing urbanization hand Economics Vol. 46

SMART N. UCHEAGBI (1998) Environmental Management and Protection. Precision Printers and Publishers Enugu.

SAVAS E. S. (1977) The organization and Efficiently of solid waste collection Lexington Books. Washington D. C. State of the environment Report 1991,

1992 and 1995 Lagos state government.

THORNCROFT (1970). Principles of Estate Management.

WILLIAM M. MARSHA (1991). Landscape planning Environmental Application. Second Edition. John Willey and Sons Inc. New York.

YABAGI A. N. (1996). The Impact of Environmental Sanitation on the incidence of Gastro enteritis among inhabitants of Bida Local Government of Niger State. Unpublished Thesis of M. Ed. Health Education University of Ibadan.

APPENDIX

QUESTIONNAIRE

Dear Sir/Madam,

This questionnaire is intended to provide supplementary data / information for research project embarked upon by a student of post graduate diploma in environmental management of Federal University of Technology, Minna, Niger State Nigeria.

Any information so provided by virtue of this questionnaire shall be treated in strict confidentiality.

Please tick where applicable.

Part A: Household

1. In which area of Minna is your house located?
2. Which of the following waste are more generated in your house?

a. Papers

b. Food Particles

c. Polythene Bags

d. Tins and Cans

e. Others

3. How do you store your waste?

a. bag

b. drum

c. bucket

d. dustbin

4. How do you dispose household waste?

a. By throwing into streets

b. By throwing into drainage

c. By dumping them at the dumping site and disposal by government and its agencies.

d. By burning

e. Incinerator

5. How often are waste removed from dumping site?

   a. very often

   b. often

   c. not often

   d. not at all

6. How often do you carry out sanitation exercise?

   a. Daily

   b. Weekly

   c. Monthly

7. How often do sanitary inspector visit your house?

   a. Daily

   b. Weekly

   c. Monthly

   d. Not at all

8. Is there any kitchen in your house?

9. Is there any toilet in your house?

   a. YES b. NO

10. If YES which type?

a. Water closet system

b. Pit Latrine

c. Bucket Latrine

11. Is there any constructed drainage to drain sewage from your house?

a. YES b. NO

12. If YES which type of drainage?

a. Open drainage

b. Close drainage

13. Kindly score the environmental sanitation level of this neighbourhood.

Part B

Practicing Estate Surveyors and Valuers

1. What is the name of your firm?

2. What is the rent passing (per annum) of the following properties within listed locations:-

Property Types	Kpakungu	Anguwan Kaje	Tunga	GRA
A Room A Room and Parlour One Bedroom Flat Two Bedroom Flat Three Bedroom Flat Four Bedroom Flat A Shop (3m x 4m) A Shop (4m x 5m)				

4 What is the capital value of the following within the under listed locations

Property Types	Kpakungu	Anguwan Kaje	Tunga	GRA
A Room A Room and Parlour One Bedroom Flat Two Bedroom Flat Three Bedroom Flat Four Bedroom Flat A Shop (3m x 4m) A Shop (4m x 5m)				