

**THE IMPACT OF CONSTRUCTION INDUSTRY ON
THE ENVIRONMENT
(A CASE STUDY OF F.H.A LUGBE - ABUJA)**

WRITTEN AND SUBMITTED

BY

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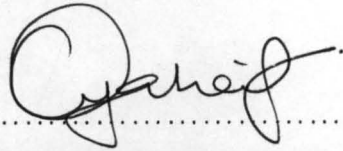
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A project submitted to the Post graduate School, Federal University of Technology, Minna in partial fulfillment of the requirements of the award of the Postgraduate Diploma in Environmental Management of the Department of Geography, school of Science/Science Education, Federal University of Technology, Minna.

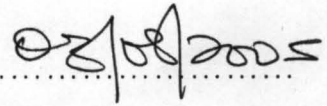
DECEMBER, 2004

DECLARATION

I hereby declare that this project has been prepared by me and that it is a record of my own research, as part of the requirement for Postgraduate Diploma in a environmental Management it has not been presented in any previous application for postgraduate Diploma.



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IYAHEN OMODAMWEN EWANSIHA.



.....
DATE

DEDICATION

I dedicate this project to the Almighty God who made it possible for me to undertake the course and of the support of my wife Alemye and my little boys, Abraham and Abel.

ACKNOWLEDGEMENT

I wish to express my sincere appreciation to Dr. G.N. Nsofor, my project supervisor, for his guidance, tolerance, immense contribution and brotherly dispensation.

I also acknowledge the tremendous contributions of my lecturers, Prof. Baba, Prof. Adefolalu, Dr. Sadauki, Dr. Akinyeye, Dr. Mrs. Odafen.

I also express my gratitude to my Dad and Mum Prof. & Mrs. S.O Iyahan for their immeasurable inputs and support.

ABSTRACT

This project identifies the nature of the relationship that exists between the Construction Industry and the Environment, the various environmental systems and their interactions, nature and scope of construction projects. It throws light on the various impacts of the industry on our environment, the prerequisites of a good environmental management practices in construction industry. It highlights the concept of sustainable development as synonymous with sustainable construction industry.

The project offers a platform for a clinical rather than a contributor to the already deteriorating Nigerian environment, through the various recommendation for the enforcement of environmental standards and guidelines for critical civil constructions activities and the application of environmental management in construction.

The project break down our environment into land, air, water and Social economic environment. Here the impact of the industry on land before and after the Construction Industry are analysed. Likewise the other units in which our environment is broken down into for example in air the decree of air pollution is higher as a result of increased human activities from the construction Industry together with increase human population due to presence of infrastructure. Compared with the undisturbed pollution free air in the original natural state that existed before the advent of the construction industry.

As a result of the activities of construction industry there is increase usage of water resource resulting in depletion of water levels. Small streams and water sources are drawn from, wells, boreholes and the

CHAPTER ONE

1.1 INTRODUCTION

Construction is a form of urbanization whereby areas are opened up for the provision of shelter and convenience for the habitation of man. This cannot be complete unless there is a disturbance on nature's activities as the case may be. The quest for urbanization goes hand in hand with construction resulting in the provision of schools, offices, shelter market, provision of access roads to reach these areas, pipe borne water, electricity, communication centers etc. All these and more have to be in place for there to exist a link in social and economic activities.

As a result of construction industry, there is loss in the natural states of the environment. The project highlights both the positive and negative impacts of the construction industry on the environment. Until now the construction of our social-economic and physical structure have not been environmentally suitable. Structures have not been assembled in environmentally acceptable manners because of inadequate planning, consideration for design and documentation. The construction industry has been characterized by increasing disregard for health and safety of the public, pollution of the environment by way of noise, heavy traffic on our roads, vibrations, spillage of fossil fuel, emission of toxic gases threatening our ecosystem etc.

Our communities' social-economic, cultural and political needs for a better life should not be traded for economic driven environmental projects. Rather consideration should be made for co-existence i.e. mutual balance between ecology/urbanization.

The quest is for sustainable development, a development which will address social infrastructural needs while exercising care to minimize potential negative impacts, a good development should meet the needs of the present generation without compromising the ability of future generation to meet their own needs.

1.2 STATEMENT OF THE PROBLEM

The quest for sustainable development/urbanization should address social - infrastructural needs while exercising care to minimize potential negative impact, that is, development that should meet the needs of the present without compromising the future generations ability to meet their needs. The effect of construction industry in the F.C.T Abuja shows that there is no integration between the industry and the environment. This is an opportunity to match the works of both the construction industry and the environment.

1.3 AIM/OBJECTIVES

The major aim is to asses the impact of construction industry on the Federal Capital Territory, Abuja that is the positive and negative impact of construction and to recommend appropriate approach to construction and environment management.

The objectives of the project is to comprehensively look into the various aspect of our environment the industry affects, outline the various impact resulting in the activities of the industry before and after the industry and to proffer possible solution.

1.4 JUSTIFICATION

The importance of carrying out this project cannot be over emphasized as the marked contradiction that exist between urbanization and sustainable environmental management practice is very visible in the Federal Capital Territory, Abuja. For the benefit of the new Federal Capital when this marked contradictions are highlighted and the gains of urbanization are pointed out the opportunity for greater gains resulting from the establishment of a new Federal Capital will be better appreciated.

1.5 STUDY AREA

1.5.1 LOCATION

Abuja is located in the center of Nigeria. It is bounded in the North by Kaduna State, on the West by Niger State, on the East and South last by Nassarawa State and on the South-West by Kogi State. It falls within latitude $7^{\circ}25'N$ AND $9^{\circ}20'$ North of the equator and longitude $6^{\circ}45$ and $7^{\circ}39$.

1.5.2 CLIMATE

It composes of rolling hills, isolated highlands combined with Savannah glass land of the North/Middle Belt with richness of the tropical rain forest of the South. It falls within the climate transition zone i.e. between humid South and Sub-humid North of the country, making it neither too hot nor too cold all year round.

The annual total rainfall is between 1100mm – 1160mm. It is has constant rainfall between July – September.

1.5.3 VEGETATION

With one of the most mature occurrence of forest vegetation in Nigeria. It falls within the Savannah Zone of West African Sub-region, which is classified into:-

(i) Grassland Savannah

Only a few trees/Shrubs are found in this area, it occupies about 55% of the entire land mass of the Federal Capital Territory.

(ii) Savannah Woodland

This area covers about 15% of the entire land mass of the territory which is characterized by its inaccessibility / rugged nature of its terrain.

(iii) Shrub Savannah

It occurs extensively to surrounding hills / ridges with characteristics rough terrain it covers 13% of the entire land mass of the Federal Capital Territory. It can be found in all parts of the Territory.

However we have patches of rain forest around the territory covering about 74% of the vegetation cover of the Territory. These are common features in and around the Gwagwa plains especially in the gullied terrain to the South and the rugged South Eastern parts of the Territory.

1.5.4 GEOLOGY

In terms of Geology the pre-Cambrian Basement Complex Rock Country accounts for more than 80% of the territory. Although it also possesses the sedimentary belt in the Southern and South-Western extremities of the territory.

1.6 SCOPE AND LIMITATION OF STUDY

The study covers the harmonization of the existing blue print/policies for the construction industry and the environment in order to enhance the living standard of both the present and future generation with great emphasis on environment friendly construction practice. The study highlights the struggle between man and nature over the terms of man's existence.

The study is a response to the growing concern about the state of the Federal Capital Territory's Environment with regards to the ever increasing distortion of the sector due to the impacts of the construction industry.

Several constraints we experienced during the research as both government and private company and agencies were not disposed to making available, substantial information about their activities for the fear of public scrutiny. This is as a result of greater public awareness, due to the searchlight thrown on these areas by the present Minister of the F.C.T Mallam Nasir El-Rufia.

The non-availability of reliable data base/information by both government and private agencies responsible for the construction industry and Environment is another constraint.

The method applied for the research in my field work involves carrying out interviews/observations from past and present experience. The benefit of the my past experience working at different parts of the Federal capital gave a reliable and on the spot assessment as a result of my interaction with contractors, construction workers, project supervisors, artisans, suppliers and petty traders(food vendors) on site.

1.7 STRUCTURE OF THE THESIS

The project is structured by dividing our environment into land, air, water and socio-economic environment.

The effect of the activities of the construction industry before and after on the various environment are highlighted by carry out surveys in the proposed area of study. The results of the surveys are analysed by means of tables and bar charts.

With these, the impact of the industry on various environments are better appreciated and adequate recommendations are made.

1.8 DEFINITION OF BASIC CONCEPTS

Construction: Is the act of bringing or putting in place a thing or structure that never existed.

Environment: Is our surrounding

Management: Is the proper administration or running of human material resource

Urbanization: Is the opening up of new areas for improved technological infrastructure e.g. road, shelter, potable water e.t.c

Sustainable Development Is positive growth that cares for the present and future generation by provision of social – infrastructural needs and reduces to negligible level the negative impacts

CHAPTER TWO

LITERATURE REVIEW

The idea of a new Federal Capital was given birth to in 1975 by the then Military Government under the leadership of Late Gen Murtala Mohammed. The reason for the establishment of the new Capital was as a result of evident growing problem of housing and accommodation in Lagos due to growing/increasing economic activities at all levels.

In the human societies provision of housing is considered as one of the basic necessities of life. Thus one of the worst characteristic features of destitution and neglect is homelessness.

Human development in all its ramifications essentially requires decent shelter. The provision and the acquisition of decent shelter is one of the challenges of life. One needs a house to start a family and to be creative.

2.1 GOVERNMENT INVOLVEMENT IN CONSTRUCTION INDUSTRY

The involvement of government in the construction industry came about in order to address the vital problem of congestion, the problem of rural / urban migration resulting in the congestion of cities and consequently over stretching of existing infrastructure. Also the need to assist / compliment the effort of indigenous bodies involved in construction industry encouraged the federal government to double its effort in this respect. Resulting in the introduction of mass housing policy to cater for housing needs of the populace. As a result of this federal government initiated the construction of thousand of housing unit. These lead to the relocation of the Federal Capital Territory to Abuja.

The relocation of the Federal Capital with headquarters (offices) of the ministries and parastatals has immensely increased the demand for accommodation for all levels of staffs.

Therefore the federal government established the Federal Capital Development Authority responsible for the building and construction of both residential and official quarters for federal government staffs, which began in the early 1980s. They embarked in the opening up of layout/districts to cater for these housing needs. Layouts were opened in Garki, Wuse, and Maitama etc. The construction of houses, roads and other infrastructure, has robbed the environment of its natural beauty resulting in afforestation, deforestation, air and water pollution and consequently environmental degradation. This resultant effect is due to non-compliance with environmental laws/guidelines by this construction companies.

Some of the important provisions in our environmental policies overlooked, range from the distortion of original layout/district plans to compromise in construction standards. (Procedures Materials).

The problem of distortion is frequently noticed in the allocation of plot by staffs of the federal capital development authority, on green areas, proposed roads/drainages and even the construction on already existing drainages and sewages.

2.2 GWARIMPA HOUSING ESTATE

Gwarimpa Estate is the federal housing authorities response for a decent and affordable accommodation in the Federal Capital Territory. Gwarimpa estate is divided into two by Gwarimpa

River. The original topography of the area is fairly undulating and well drained soil with seasonal streams criss-crossing the estate area providing natural drainage channel. But due to the impact of the construction industry on the environment some of these natural drainage channel have been altered leading to frequent flooding problems.

The housing estate is about the federal government initiatives towards meeting up with its housing programme. It consists of about ten thousand unit of housing for all levels of government staff. From two bedroom bungalow (detached/semi detached), block of flats containing six unit of three bedroom, four and five bedroom duplex (Detached/ semi detached).

This estate was given out to various construction firms by government for its execution. While supervision was done by the Federal Housing Authority. The various firms range from small firms to large firms which include some of the following:

Adlkan (Nig) Limited.

Citec (Nig) Limited

Berger (Nig) Limited

Julius Berger (Nig) Limited

PW (Nig) Limited

Setraco (Nig) Limited etc

2.3 KADO HOUSING ESTATE

Kado Housing Estate, Kado also knowing as J.T Useni Housing Estate consist of housing unit numbering about 477 units. From three bedroom bungalows to four bedroom duplexes (detached/semi detached).



Plate 2: Prototype 3 bedroom bungalow with courtyard, Federal Housing Estate Lugbe.

The original topography consists of thick vegetation cover which helped to check the action of winds/water and other erosion agent. The Kado River runs though the estate on both sides. There are occasional appearances of rock out crops and it is characterized by well drained soil.

2.4 LUGBE HOUSING ESTATE

In other to narrow the scope of the survey the focus of our study will be on Federal Housing Estate Lugbe. The reason for Lugbe F.H.A is that it possess similar features of the entire Federal Capital Territory with small patches of similarity in vegetation, Geology, topography etc giving us an overview of the Federal Capital Territory. The High decree of activities of construction Industry in operation in the area is of great significance. The activities are carried out by small indigenous construction firms, to large foreign firms, involved in the provision of infrastructures e.g. Housing, roads, electricity, pipe-borne, water, recreational facilities, hospital etc. Due to the size of the Estate and the proposed completion time a number of firms sprang up in other to participate in the benefits accruing from such large projects. The result is the negative impact of the construction industry on the environment.

In the future, execution project of such magnitude must bring into consideration/rather make it compulsory for only firms with established/seasoned professional with background in environmental management to be involved in the execution of such projects. This will help to check the negative impact of the construction industry on the environment.

The various data from the interviews, observations participatory rural appraisals etc were collected to arrive at the various environment impact as a result of the construction activities.

The various stages of the project were looked into another to have a general over view of the environmental impact; the existing conditions of the entire project area and its surrounding were assessed. Also the pre construction and post construction scenario was also highlighted.

BACKGROUND

The mass influx of people into the federal capital territory, Abuja and its satellite town was as a result of relocation of the country's capital from Lagos to Abuja resulting in housing difficult. In other to meet up with the housing needs, the Federal Capital authority initiated the project to supplement other housing project. This will also provide employment for thousands of people; provide accommodate and infrastructural facilities, etc.

LOCATION, CONCEPT AND SCOPE OF THE PROJECT

The federal housing authority (FHA) project, lugbe is located in the suburban outskirts of city centre. The Lugbe F.H.A is an area of the master plan made up of a whole planning district, It is accessible via the southern express way i.e. Abuja – Lokoja- Benin high way just by the new city gate.

The project covers a landmass of about 750 Ha, and it designed to provide about 5, 000 low -cost housing units for the lower and medium income groups. Excluding the plots of land allocated to private individuals and organizations to develop. It

has inbuilt provision for recreational, social, commercial, industrial, religious, educational facilities and also some areas have be provided for green areas, natural spaces.

The scope of the project include general bush clearance, construction 1,2 and 3 bedroom prototype bungalows with courtyard and provision of infrastructural facilities.

The Federal Housing Authority Estate Lugbe has been more than 60% completed. Going through the phase from concept and feasibility studies, engineering and design procurement and construction.

LUGBE BEFORE THE CONSTRUCTION INDUSTRY

The conductions that existence before the construction industry commenced its works will be looked at as follows:

(i) HUMAN SETTLEMENT

The Lugbe housing Estate from which the project derived it name composed of the original settlers which included the Gwari's, Fulani's and other natives it composed of a population of 1000 people mostly farmers, cattle herds men, hunters, and fishermen while the women folks indulge in firewood trade.

For the Gwari's they compose of mostly farmers and hunters, while the Fulani's are known for cattle rearing, while other natives engage in farming and fishing.

(ii) FARMLAND

Most of the farmland abounds within the project site belongs to the inhabitants of the village. The croup type mostly



**Plate 3: Typical Housing Settlement of original inhabitants of Lugbe.
(Type 1)**



**Plate 4: Typical Housing Settlement of original inhabitants of Lugbe.
(Type 2)**



**Plate 5: Showing typical stream criss-crossing the entire
Landscape of Lugbe.**



**Plate 6: Predominant occupation of original inhabitants, farming.
(Preparation of Ridges for farming)**



Plate 7: Original Landscape with occasional occurrence of rock outcrops/forest land/ grass land.

cultivated are yam tubers, cassava, rice, groundnut, millet, maize etc.

(iii) **TOPOGRAPHY**

The area comprises of a mixture of forest, grassland and swamps. It comprises also of Rock outcrops of mostly igneous and sedimentary origin dotting the entire landscape. With several streams criss-crossing the entire terrain. These streams served as source of domestic water/fishing for the inhabitants of the area and till date source of water for the various construction activities been carried out in the project area.

With substantial flora and fauna in existence, some areas had not been exploited by the settlers (inhabitants) with abundant plant and animal species. It provided a good hunting ground for hunters. Monkeys, reptiles, birds etc were daily sighted in the area before commencement of construction activities.

With the acquisition of the over 700 hectares of land by the Federal Housing Authority for the project, all these would become history in a matter of time.

2.5 IMPACT ON ENVIRONMENT

ENVIRONMENT

The environment in this content is a reservoir of resources on which man draws to sustain his activities and ensure his survival and well being. The term environment is generally used in its restrictive physical sense, rather than the broad social-

anthropological sense. It connotes the components and system of the geo-sphere e.g. Water bodies, air i.e. atmosphere, soil i.e. land etc.

Our study will lay emphasis on the impact of the industry on water/water bodies, air, land and social economic environment in the Federal Capital Territory, Abuja. The activities of the construction industry have a direct impact on the external environment although may extend beyond the visual.

2.6 DEFINITION/NATURE OF IMPACT

This is the negative or positive change in man's well being that results from environmental effects of construction industry. Construction process begins with clearing of trees, grasses etc in order to make way.

The resultant effect is deforestation, displacement of other forms of life from its natural setting, depletion of non-renewable basic raw material e.g. fuel, sand, limestone, litrite etc.

Negative change may result when man tries to drastically modify his environment without regards. A positive change may occur when there is conscious effort by man to modify and make provision for displaced natural elements that make up the environment.

2.7 TYPES OF ENVIRONMENTAL IMPACT

As a result of the activities of construction industries in Federal Housing Estate Lugbe. Various types of environmental impacts result, which are as follows:-

- (i) Impact on water

- (ii) impact on air
- (iii) impact on land
- (iv) impact on basic construction material
- (v) impact on health
- (vi) impact on employment
- (vii) impact on wide life
- (viii) impact on forest vegetation
- (ix) impact on social environment

For the purpose of this study the following impact of the construction industry, will be grouped into four categories i.e. the impact on water, air, land and social economic environment.

2.7.1 IMPACT ON WATER

During construction activities several incidence may result in various effects, ranging from presence of coloured matter, toxic substances, floating materials, bacteria and viruses, finding its way into water/water bodies.

The presence of these substance isolated/jointly in water results in contamination resulting in water been unfit for human consumption and unsuitable for industrial or agricultural purpose. They have devastating effect on agricultural environment and interferes with recreational use of water.

Also water from construction sites have these deleterious substance which may find their way into nearby ponds/streams thereby causing devastating and expensive damage to aquatic life. The activities of construction industry has also led to the reduction of water levels or drying up of wetlands as a result of



**Plate 8: Showing natural stream which was original source of water for
domestic use and fishing purposes**

excessive withdrawal for the carrying out of their activities. Also ground water is polluted from gradual seepage of polluted surface water from the activities of construction industry.

2.7.2 IMPACT ON AIR

As a result of increase in construction activities on our environment, air pollution also increases. Air pollution according to the World Bank (1978) is the presence in the outdoor atmosphere of one or more contaminants in such quantities, characteristics and duration as to make them actually injurious to human, plant or animal life, or to property, or which unreasonably interferes with the comfortable enjoyment of life and property.

The activities of the construction industry results in emission of high volumes of dust, toxic fumes, smoke, gas etc from heavy machines/ automobile, which are used in carry out various operations.

As a result of massive land clearing and road constructions, high concentration of dust particles find their way into the air.

However the basic determinants of the effect of air pollution are the concentration or quality of material or substance emitted, the time of the exposure, or the persistence of a given level of a concentration of pollutants.

As a result of the action of these smoke, fumes/toxic gasses there is a resultant depletion of the Ozone Layer leading to unusual high temperature. Inhabitants of Lugbe Federal Housing Estate have begun to experience, high temperature leading to excessive perspiration.



Plate 9: Shows reduced quality of water due to presence of foreign bodies which interferes with use.

2.7.3 ON SOCIAL ECONOMIC ENVIRONMENT

The commencement of construction of the Federal Housing Estate Lugbe has resulted in disruption /displacement of human settlement and activities. The affected are the Gwari farmers, the Fulani's and other natives. Which means alternative farm land have to sort for and also fishing steams and grazing land for the Fulani's. It has also brought about employment to some of the displaced inhabitants whom do not have alternative; it has also brought about increased living standard, due to compensation paid to original inhabitants as they were mainly subsistence farmers. As a result of increased commercial activities, there is increase in income generation and the problem of increase in crime for an inhabitant that knew little or no crime.

There is enhanced quality of the environment as a result of well laid-out road network, beautiful houses, access to potable water, electricity etc, but the need to imbibe the culture of maintenance/management should be encourage i.e. proper refuse disposal, quick replacement of broken-down pipes (water/ electricity) etc.

2.7.4 IMPACT ON LAND

The impact of construction industry on land may be outlined side by side its impact on exploiting basic construction material. Here there is considerable loss of agricultural land to the construction of road, building, loss of land to borrow pits and mining of litrite and gravel is substantial.



...which interferes with use.

Plate 10: Showing effect of construction activities resulting in the loss of land to borrow pits/mining of laterite and gravel.

The impact of construction industry on land has resulted in the increased occurrence of erosion, flooding due to excessive removal of vegetation cover resulting in, increased run-offs, destruction of valuable fauna and flora. The dumping of oil, rubbles, toxic waste and similar materials during construction activities also have an additional negative effect on land.

All these results in demising food production and loss of means of livelihood. The activities of miners on abandoned borrow pits results in land degradation. Resulting in scarcity of land leading to migration and over crowding.

Its impact on land can alter in such a way as to render land unsuitable for use. Under conditions of uncontrolled use, land could become a hazard or nuisance to the adjacent structure property or populace.

The negative impact of the activities of the construction industry are more pronounced in man's physical environment, resulting in common occurrences of flooding and erosion and also deforestation and forest depletion.

The study of impact of the industry on land will not be complete without taking a look at the following, which are very common occurrence/ features which characterize Lugbe Federal Housing Estate and its environs.

- i) Flooding
- ii) erosion
- iii) deforestation
- iv) forest depletion

2.7.4.1 FLOODING

Flooding is a relatively high discharge of water above an arbitrary selected level of water discharge. When the discharge cannot be accommodated within the margin of its normal channels that water spreads over adjoining grounds upon which crops or forest are not able to flourish. During periods of high flooding in Lugbe Federal Housing Estate, farmland and valuable property are lost due to the action of flood water, road become inmotorable. The flood conditions, in the Federal Capital Territory are mainly structural. This is as a result of building of house on side drains, sewages and even on roads by desperate land, seekers without taking due cognisance to the laid out plan. This problem is also aggravated by the construction of road/ dam etc along natural water channels; this tends to obstruct the flow of storm water after rainfall resulting in devastating flood conditions.

2.7.4.2 EROSION

Considering the impact of the activities of the construction industry in the Lugbe Federal Housing Estate we realize that there are two major consequences of the impact of the industry which are the action of water and wind erosion respectively.

The absence of vegetation cover, which result from their removal by construction activities in other to make way in, achieving physical development and meeting up with our socio-economic needs has greatly aided soil erosion. The presence of vegetation cover which would otherwise act as winds/water break over ground surface, thereby checking the action of these erosion agents as being greatly hampered by the activities of the Construction Industry.

2.7.4.3 DEFORESTATION

Deforestation is one of the most pressing contemporary environment problems in the Federal Capital Territory, which is gaining unobserved dimension. It is the indiscriminate felling of trees without effort at replacing it.

The indirect consequence of construction brought about by the need for socio-economic infrastructure for development as a result of urbanization and population pressure which is the most important direct factor causing large scale deforestation in the Federal Capital Territory. The Federal Capital Territory in currently the largest construction industry in Africa (construction digest October, 1998). the entire landmass is devoid of its natural vegetation cover exposing the occupations to hazardous weather conditions such as increase in atmospheric carbon dioxide with the subsequent rise in temperature/decrease in rainfall, increased soil erosion and decline in soil fertility to the loss of species and biodiversity, lowering of the water table, disruption of ecological balance and increased rate of evaporation due to exposed soil.

2.7.4.4 FOREST DEPLETION

Depletion of forest resource as a result of the impact of construction activities are more pronounced on timber, bamboo trees due to its continuous use as roof rafters, ceiling, noggins doors, windows, frames/wardrobes, kitchen cabinets, formwork, site office, storage etc. the depletion of these forest resource will lead to scarcity, high cost of material and ultimately higher cost of the project. During road construction, forest resources

are lost by action of heavy machine used during clearing, while opening up way for proposed roads. The regular clearing of forest results in deforestation, contributing to the high temperature prevalent in the Federal Capital Territory

CHAPTER 3

METHODOLOGY

3.1 FIELD INVESTIGATION

The collection of various field data from personal interviews, analysis of document from government and private agencies participatory rural appraises, information from various environment monitoring field offices has helped to arrive at the conclusive impacts of construction industry on our environment using our social economic environment, water, air and land for our study.

In conducting these interview engineers, villagers, original settlers, farmers, hunters, fishermen were interviewed the data type / information collection reflected on the effects of construction industry as it affects the major components of water, air land and social economic environment as reflected by the degree of distribution of grasses, trees, shrubs, biomass diversity, its reduction/distribution, impact on flowing water/stream, lakes / rivers as also the general quality of air in and around the Federal Capital Territory, Abuja with particular reference to Federal Housing Authorities Estate in Lugbe where the activities of construction industry is robust.

3.1.1 DATA ANALYSIS

QUESTIONNAIRE / RESEARCH QUESTION

This study is structured to highlight the nature of the impact of construction industry on the main areas of our study, which include social economic environment, water, air and land. These form the basis for the research question from personal interview

with various classes of people in and around the Federal Housing Estate, Lugbe, Abuja faced with the activities of the numerous construction industries.

(Reference made to questionnaire in Appendix)

CHAPTER 4

PRESENTATION AND DISCUSSION OF RESULT

4.0 SOCIO – ECONOMIC ENVIRONMENT

From the questionnaire

Questions 6, 7, 8 and 9 reveals by using frequency, percentages of the impact of construction industry on social economic environment.

TABLE 4.0

Question 6	Value	Frequency	Percentage %	Value %	Cumulative %
Average income before					
High	2	35	35	35	35
Low	5	65	65	65	65
Total					100

Table 4.0 indicates, a higher number of respondents with lower average income with 65% and 35% showing a lower number indicating higher average income.

TABLE 4.1

Question 7	Value	Frequency	Percentage %	Value %	Cumulative %
Average income after					
High	5	85	85	85	85
Low	2	15	15	15	15
Total					100



**Plate 11: Improved housing condition at Federal Housing Estate, Lugbe.
(After construction)**



**Plate 12: Improved access roads within Federal Housing Estate, Lugbe.
(After construction)**

Table 4.1 indicates, marked increase in number showing higher average income of 85%, while 15% indicates low income showing a reduction in the number of low average income earners.

TABLE 4.2

Question 8	Value	Frequency	Percentage %	Value %	Cumulative
Disturbed by activities					
Yes	5	30	30	30	30
No	2	70	70	70	70
Total					100

Table 4.2 indicates, a lower number been disturbed by the activities of the construction industry by 30% and 70% indicate been disturbed by their activities.

TABLE 4.3

Question 9	Value	Frequency	Percentage %	Value %	Cumulative
Improved quality of surrounding					
Yes	5	80	80	80	80
No	2	20	20	20	20
Total					100

Table 4.3 reveals an 80% improved quality of surrounding, while 20% show no improvement in the quality of our surrounding.

4.1 WATER

From the questionnaire question (10) and (11) reveals by using frequency percentage of the effect of construction industry on water as part our environment.

TABLE 4.4

Question 10	Value	Frequency	Percentage %	Value %	Cumulative
Reduction in Water quantity					
Yes	5	65	65	65	65
No	2	35	35	35	35
Total					100

Table 4.4 indicates a 65% reduction in water quantity, where 35% indicates otherwise.

TABLE 4.5

Question 11	Value	Frequency	Percentage %	Value %	Cumulative
Reduction in Water quality					
Yes	5	65	65	65	65
No	2	35	35	35	35
Total					100

Table 4.5 indicates 65% reduction in water quality and 35% feel otherwise.

4.2 AIR

From the questionnaire, question (12) and (13) reveals by using frequency, percentage the impact of construction industry on air as an aspect of the environment.



Plate13: Reduced water level/quality due to activities of construction industry.

TABLE 4.6

Question 12	Value	Frequency	Percentage %	Value %	Cumulative
Frequency of occurrence of air pollution before					
High	5	10	10	10	10
Low	2	90	90	90	90
Total					100

Table 4.6 indicates a near negligible occurrence of air pollution with 90% showing while 10% indicates otherwise.

TABLE 4.7

Question 13	Value	Frequency	Percentage %	Value %	Cumulative
Frequency of occurrence of air pollution after					
High	5	85	85	85	85
Low	2	15	15	15	15
Total					100

Table 4.7 shows a marked increase in the occurrence of air pollution after the construction industry commenced their activities 85% when compared with the percentage before the activities began. While 15% indicates otherwise.

4.3 LAND

From the questionnaire question (14) and (15) reveals by using frequency, percentage of the impact of construction on land as an aspect of the environment.

TABLE 4.8

Question 14	Value	Frequency	Percentage %	Value %	Cumulative
Productive use Of Land before					
High	5	90	90	90	90
Low	2	10	10	10	10
Total					100

Table 4.8 shows high productive use of land by 90% and 10% low productive use of land.

TABLE 4.9

Question 15	Value	Frequency	Percentage %	Value %	Cumulative
Productive use Of Land after					
High	2	30	30	30	30
Low	5	70	70	70	70
Total					100

Table 4.9 shows lower productivity of land were compared to the percentage of showing a higher productivity after the commencement of the construction activities. The question also shows a lower productive use of land revealing similarity with the previous data.

4.4 CONCLUSION

From the social economic environment a marked increase between the respondents before and after indicate higher average income, revealing one of the positive impact of the construction industry. Efforts need to be made to reduce the number of those disturbed by the activities of the industry and a little more to improve the quality of our surrounding.

From the aspect of our environment, which is water considerable effort needs to be made with respect to the activities of the industry in order to improve the quantity and quality of water.

From the aspect of air, the marked increase between the respondents before and after shows a disturbing increase in air pollution as a result of the activities of construction industries revealing one of the negative impact of the industry.

From the aspect of land, the marked reduction in the productive use of land reveals the alarming rate at which our environment is been degraded.

Also looking at the various data collected from observation, interviews, participatory rural appraisals, analysis of documents etc shows marked similarities with the outcome of the of the questionnaire whose result reflect a high decree of neglect on the part of the construction industry as regards carrying out their activities. The study therefore indicts the construction industry and point out the need for urgent implementation of environmentally friendly / good environmental management practices by the construction industry for the sustainable development of our environment.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 SUMMARY

The activities of the construction industry has generated various impacts on the various units of our environment under study. On land, air, water and socio-economic environment, the construction industry though a very important component of our nation's economy and the problems associated with its activities are multifaceted, there is therefore the need to introduce, preventive, mitigation and control measures in the industry that will add more impetus to the overall sustainable use of our environment by the construction industry.

Summarily, the problem associated with their activities range from indiscriminate use of land resulting in forest depletion, deforestation resulting in increase occurrence of flooding and erosion due to exposed land cover.

Air pollution, as a result of increased activities of man and machine and increased population. Water depletion due to increase use of water by the industry and growing population. Other problems associated with water includes water poisoning/pollution due its indiscriminate by the industry.

That socio-economic environment cannot be ignored because it is a major component of our environment. The advent of the industry has resulted in higher economic activities which come with attendant problems like increase crime rate, over population etc.

These summation resulted from the survey earned out via interview, questionnaires etc with the aim of accessing the impact of the industry on the Federal Capital and to recommend appropriate approach to construction/environmental management and with the objective of outlining the various impacts as it affects the various unit of the environment under study before and after the commencement of construction activities and to proffer solutions.

5.1 CONCLUSION

Construction industry is an indices of change expressing man's technological advancement via artificial means therefore the need for mild approach to its activities on the environment. Unlike, other environmental changes of weather which are regarded as natural and its natural stages occurring systematically in relation to other components of the ecosystem.

The benefit of the activities of the industry cannot be overlooked ranging from employment generation opportunities, provision of housing, infrastructural facilities, schools, hospitals, power plants, water reservoirs, markets etc. In other for all these to be achieved, the ecological balance must be upset as trees are felled, soil harvested, together with the destruction of natural habitats. Despite all these the challenges to the construction industry is the looking inward to evolve a more environmentally friendly construction practice, process and material in other to minimize the damage to the environment. Thus presupposing the need for more realistic mode of environmental focus and concepts.

Conclusively, all the participants in the contraction industries need to be properly oriented as regards the relevance of developing a sustainable construction practice.

5.2 RECOMMENDATIONS/INNOVATIONS

In other to check further degradation of our new Federal Capital, activities of the construction industry must be routinely/adequately monitored hence the need for proper funding/staffing of various government agencies.

This, can again be achieved by appropriating local incentives for all staffs of the government monitory agencies and also the appointment of environmental consultants into the development and implementation team for all environmentally significant projects in the countries capital city, Abuja

The importance of a wholestic approach of the enforcement of construction regulations/standards which control all aspects of construction activities cannot be overemphasized; therefore the need to introduce side by side the issue of construction industries with sound environmental management practice should be made pre-requisite criteria for contract placement. Only firms with required know how to implement environmental management systems should be chosen/selected to execute projects with significant environmental impacts.

The issue of safety in construction industry should be paramount in the execution of activities in the industry. While most of the fundamentals of safety applies to all forms of construction activities. Each construction activity/operation should develop its safety measures to cope with peculiar hazards e.g. in the blasting of rocks by using dynamites and excavation, drilling. etc.

In the planning of massive development projects like the FCT Abuja, all professional regulatory bodies for example Nigerian institute of architects, Nigerian institute of building/civil engineers, Nigerian institute of quantity surveyors, Nigerian institute of environmental management should come together and to articulate programme that promote environmentally friendly programmes/development, voluntarily circulate approved codes of practices, monitor/publicize environmental reports, organize seminars, workshops to create increased awareness and to educate themselves and the general public. This increased interaction would help to develop more informed decision and better performance of the construction industry.

Consideration should also be made by government on the issue of facilities management as an important ingredient for sustainable development of our environment. The government approach of building/creating/executing new project without consideration for maintenance should be given a rethink.

The issue of public awareness, about the environment can be stepped up by introduction of environmental education at all levels in country.

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APPENDIX

FEDERAL UNIVERSITY OF TECHNOLOGY MINNA QUESTIONNAIRE FOR DATA COLLECTION ON IMPACT OF CONSTRUCTION INDUSTRY ON ENVIRONMENT (CASE STUDY OF F.H.A. LUGBE, ABUJA)

(This questionnaire is for the purpose of academic research work, all responses will be treated confidentially)

(1) What is your occupation?.....

(2) Do you work in the construction industries?

Yes No

(3) How long have you lived in Lugbe?

(4) Previous vegetation cover?

Forest farmland grassland bare-ground

(5) No of Construction Company in operation?.....

Social economic environment

(6) Average income before commencement of construction activities?

High low

(7) Average income after commencement of construction activities?

High low

(8) Disturbed by activities of construction industry?

Yes No

(9) Is there any improvement in the quality of your surrounding?

Yes No

Water

(10) Any reduction in water quantity?

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

(11) Any reduction water quality?

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

Air

(12) Frequency of occurrence of air pollution before construction activities? High low

<input type="checkbox"/>	<input type="checkbox"/>
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(13) Frequency of occurrence of air pollution after construction activities? Yes No

<input type="checkbox"/>	<input type="checkbox"/>
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Land

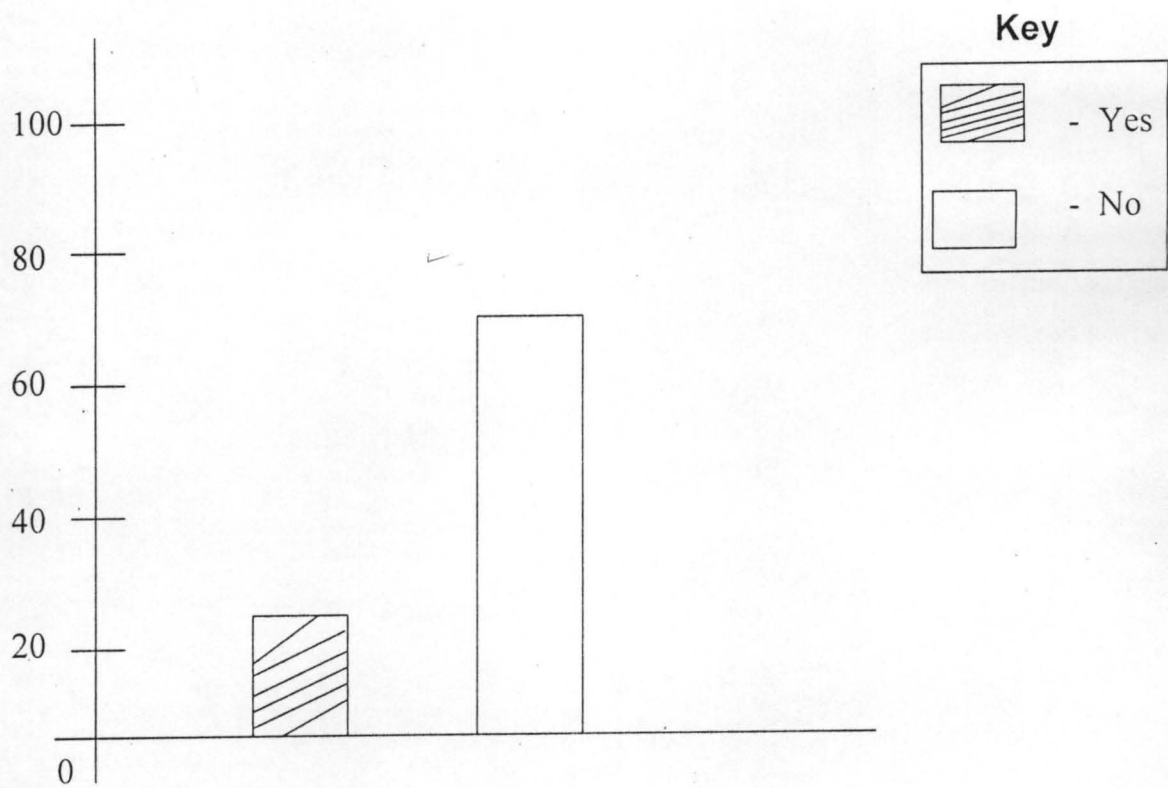
(14) Productive use of land / resource before construction activities? Yes No

<input type="checkbox"/>	<input type="checkbox"/>
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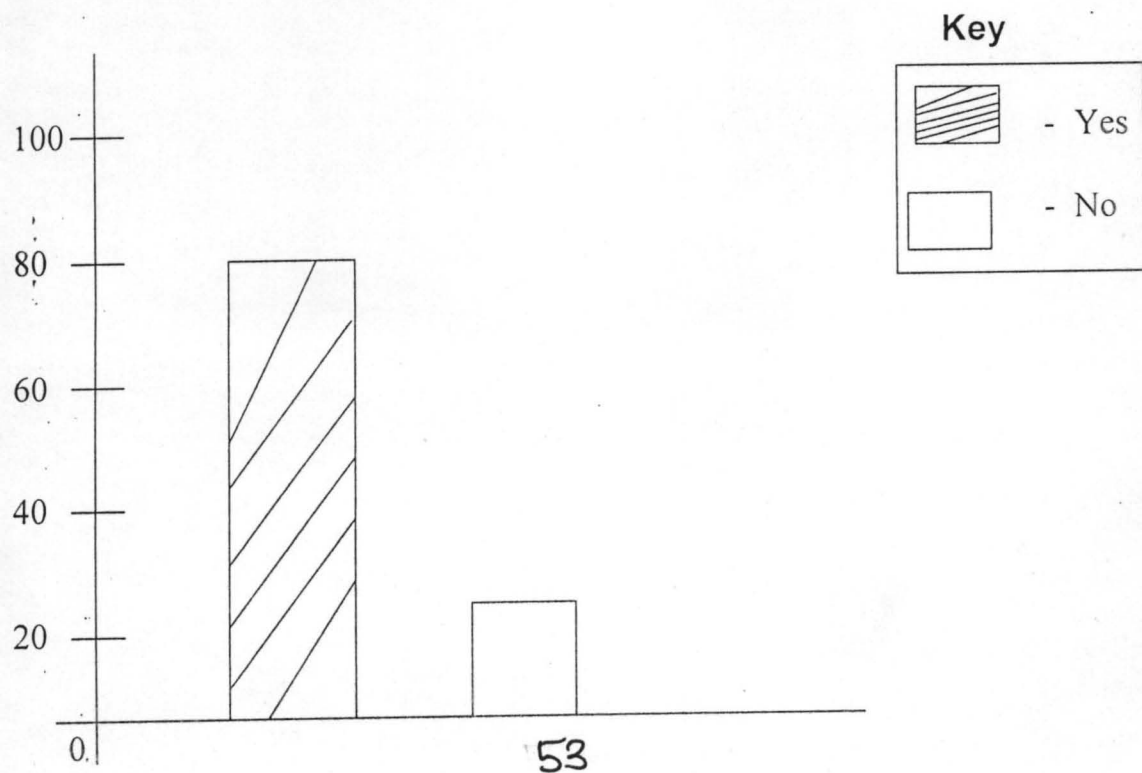
(15) Productive use of land / resources after construction activities? Yes No

<input type="checkbox"/>	<input type="checkbox"/>
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BAR CHART SHOWING NO. DISTURBED BY ACTIVITIES OF CONSTRUCTION INDUSTRY.

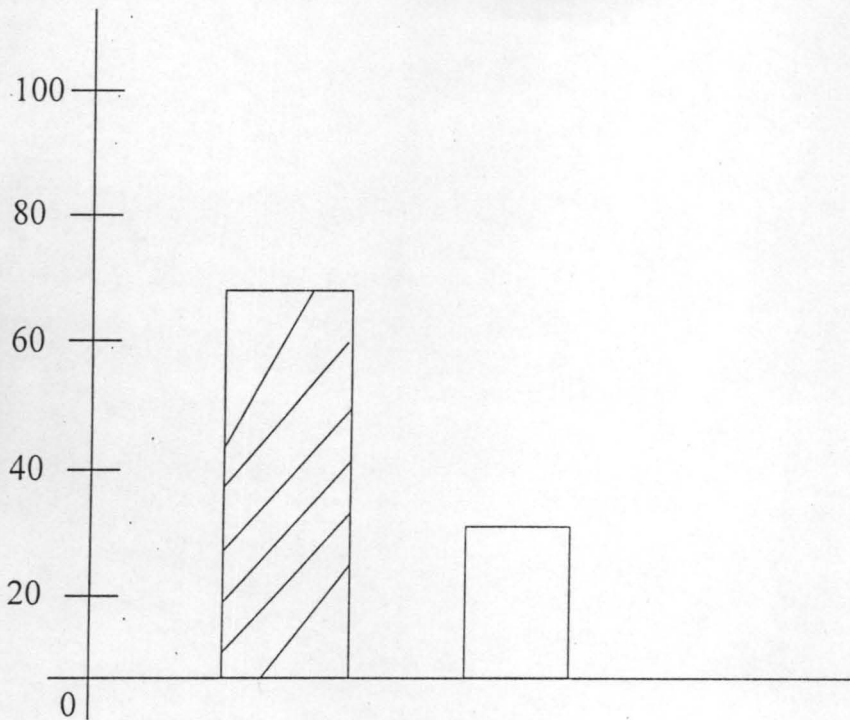


SHOWING IMPROVEMENT IN QUALITY OF SURROUNDING

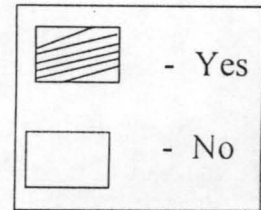


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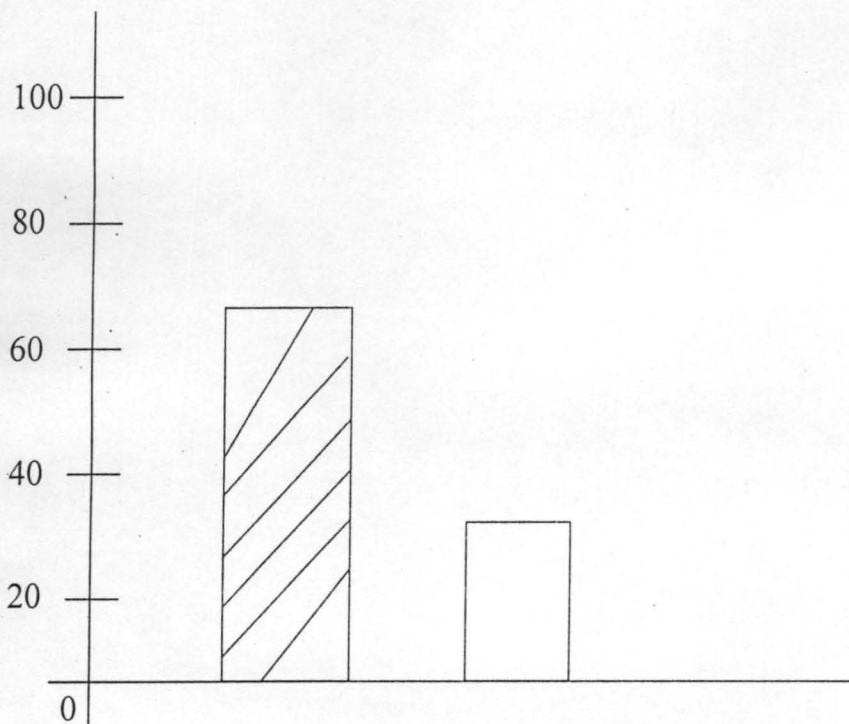
REDUCTION IN WATER QUANTITY



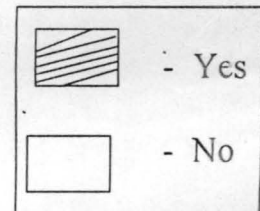
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REDUCTION IN WATER QUALITY

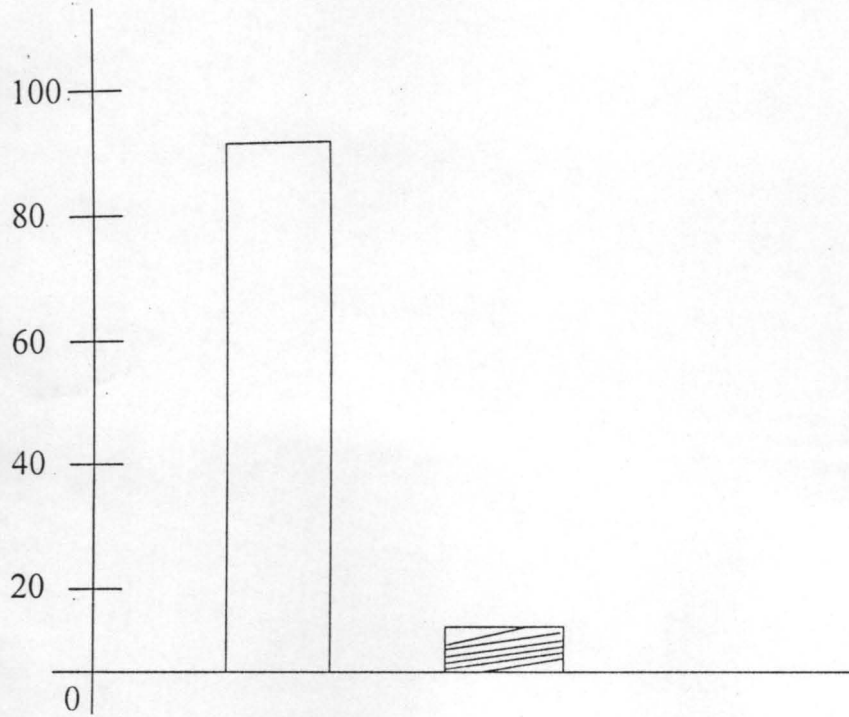


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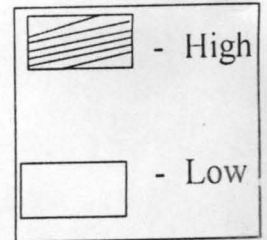


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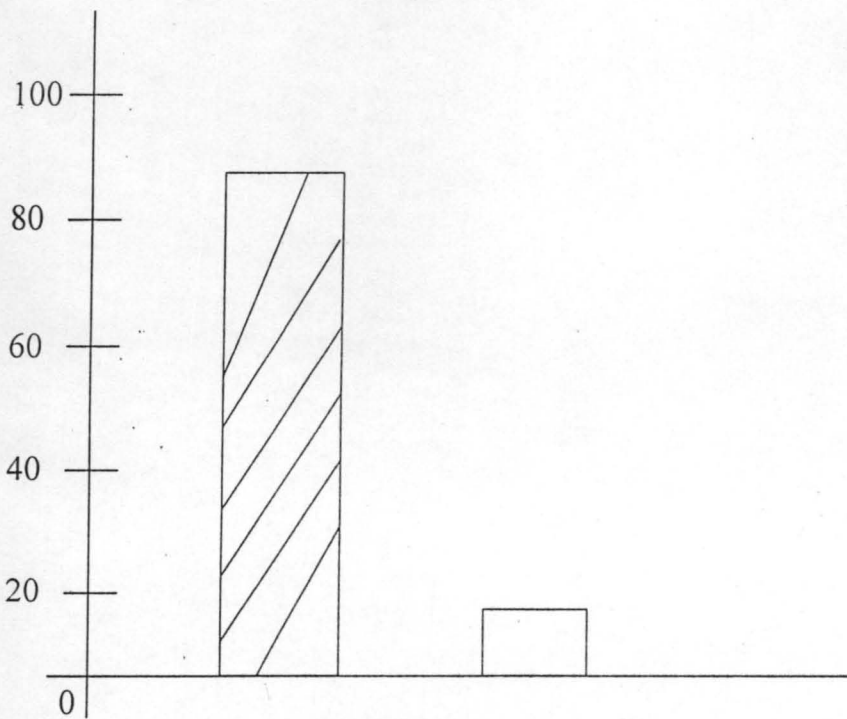
AIR POLLUTION BEFORE



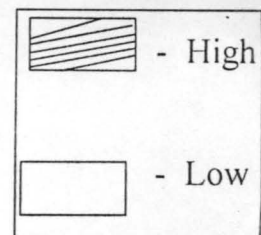
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AFTER

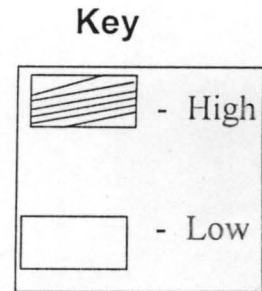
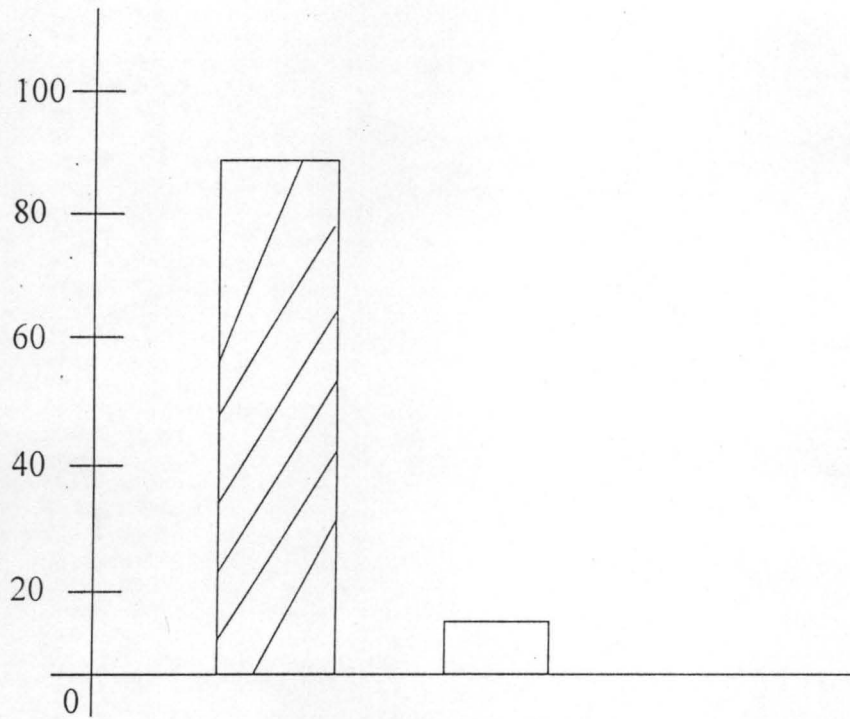


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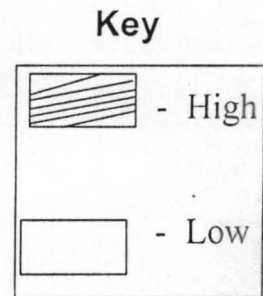
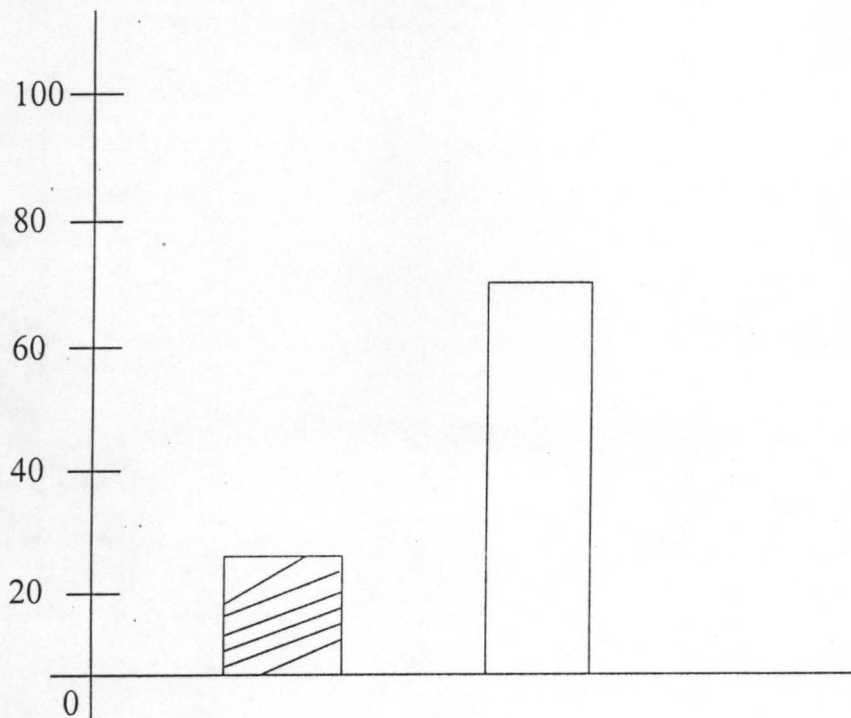


BAR CHART SHOWING IMPACT OF CONSTRUCTION INDUSTRY ON LAND.

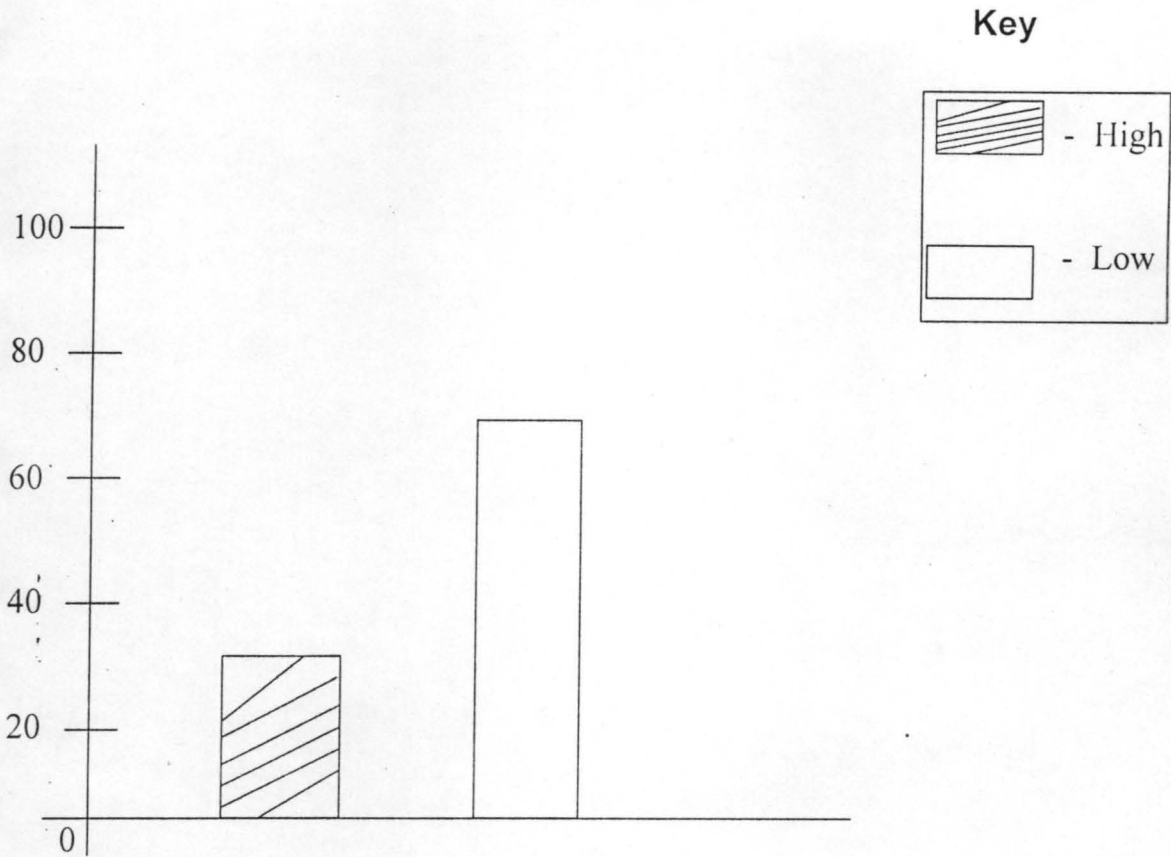
PRODUCTIVE USE OF LAND BEFORE



AFTER



BAR CHART SHOWING IMPACT OF CONSTRUCTION INDUSTRY
ON SOCIO-ECONOMIC ENVIRONMENT
(INCOME BEFORE)



(INCOME AFTER)

