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THE IMPACT OF OIL SPILLAGE ON AGRICULTURAL PRODUCTION: A CASE STUDY OF IBENO LOCAL GOVERNMENT AREA, AKWA-IBOM STATE, NIGERIA

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THE IMPACT OF OIL SPILLAGE ON AGRICULTURAL PRODUCTION: A CASE STUDY OF IBENO LOCAL GOVERNMENT AREA, AKWA IBOM STATE NIGERIA

BY

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DECLARATION

I, Sandra Ifunanya Asoya, with student Number: 2007039775 declare that this Research Dissertation is my own work and that it has not been submitted for any award at any other University.

Signature: ……..

Date: ……

ACKNOWLEDGEMENT

The task of realizing this dream of making my “vision a mission” was not one that was achieved single-handedly, rather, some important people contributed to its success. I wish nonetheless to recognize some of them by reason of the enormity of their contributions.

Firstly, I wish to express my profound gratitude and thanks to God Almighty who has been my sufficiency in all things and has brought me to a safe berth.

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The researcher is most indebted to her husband Dr S. C. Nwanze, whose morale and magnanimity has made her stay at The University of the Free State, and this report, a huge success and also most especially to my lovely children, Gemma Adaobi Nwanze and Pascal Nnabuife Nwanze, for their understanding.

DEDICATION

To the loving memory of my mother,

Mrs M.G.A. Asoya,

for her exemplary sacrifice, love and foresight.

ABSTRACT

The research project attempted to investigate the impact of oil spillage on agricultural production: A case study of the Ibeno Local Government Area of Akwa Ibom State in Nigeria. The research work was carried out in selected villages (Upenekang, Mkpanak, Iwoachang, and Inua Eyet Ikot), within the community of study.

This research study was a combination of both qualitative and quantitative research methods. Personal interviews, Observation and Focus Group Discussion (FGD) were the qualitative research methods that were employed in collecting data. In addition, Questionnaires were the primary quantitative instrument employed in collecting data from the one hundred and fifty (150) subjects chosen by the researcher for the study.

However, after analyzing and interpreting the collected information and literature, the researcher discovered that the oil spillage that occurred in Ibeno LGA, was mostly as a result of pipeline vandalization. The reasons for this were due to poor compensation from oil companies to the host community, for the massive reduction in agricultural returns, mostly from crop production. This had been caused by the said oil companies, who had taken over the community's farmlands and used them as dumping grounds for their equipment and machinery, causing massive destruction.

Appropriate tables and figures were utilized in analyzing the data collected. It was therefore concluded that oil spillage had given rise to unproductive soil, thereby killing the people's interest in agricultural activities, particularly crop cultivation and fishing. It also came to light that the oil spillage had affected the socio-economic activities of the people, thereby inducing an antagonistic relationship between the oil companies and the host community.

However, some general recommendations were made which were directed to the host community, the oil companies and the government of federal republic of Nigeria. Further recommendations were given directly to the oil companies and the government respectively.

The first major recommendation that was made was that a permanent Disaster Management Institution should be established in this area, as none has ever existed there previously. This step is important because the area (Ibeno LGA) is mostly affected by chemical hazards. The establishment of such an institution in this area will help to establish a specific disaster plan for the area.

The second recommendation was directed specifically to the oil companies and stated that community participation and involvement should be considered in matters affecting the community and that they should ensure transparency with regard to the payment of

compensations, gifts and contracts that are awarded to the community. This is particularly important as it was the major cause of the vandalized pipeline, unrest and disharmony within the community, mostly among the youths and elders.

The third recommendation was directed to the Nigerian Government suggested that they should undertake a review of laws and policies affecting the relationship of oil companies with their host communities, which ought to include the Land Use Act, EIA Decree and Petroleum Production and Distribution Act, as well as other relevant laws. Another important point would be to ensure that all relevant bodies respect human rights in their operations or in their various activities.

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LIST OF ABBREVIATIONS AND ACRONYMS

CBN	Central Bank of Nigeria
EIA	Environmental Impact Assessment
FOS	Federal Office of Statistics
IMF	International Monetary Fund
ITOPF	International Tanker Owners Pollution Federation
LGA	Local Government Area
LPG	Liquefied Petroleum Gases
N	Naira (Nigerian Currency)
NDDC	Niger Delta Development Commission
NGO	Non-Governmental Organization
NNPC	Nigeria National Petroleum Corporation
OPEC	Organization of Petroleum Exporting Countries
QIT	Qua Iboe Terminal (Mobile Operational Base)
SPDC	Shell Petroleum Development Company
TNCs	Trans-national Oil Companies

CHAPTER 1

1. INTRODUCTION

The development of the human environment worldwide has been accompanied by industrialization. The oil industry has remained the leading sector of the Nigerian economy for many decades now.

According to EIA (2009), the Nigerian economy is heavily dependent on the oil sector which accounts for over 95 percent of export earnings and about 85 percent of government revenues. The oil industry is primarily located in the Niger Delta area of the country. In addition, Nigeria had an estimated 36.2 billion barrels of proven oil reserves as of January 2009.

In 2008, Nigerian crude oil production averaged 1.94 million bbl/d, making it the largest crude oil producer in Africa. And also being an important oil supplier to the United States. Over half of the country's oil production is exported to the United States. In 2008, Nigeria exported most of its 2.17 million bbl/d of oil production (approximately 1.9 million bbl/d was exported). Of this, 990,000bbl/d (44 percent) was exported to the United States, making Nigeria the 5th largest foreign oil supplier to the United States. The major foreign producers in Nigeria are Shell, Chevron, ExxonMobil, Total and Eni/Agip (Experts column, 2010).

Nigeria is greatly endowed with abundant natural resources and the weather supports year-round agricultural production. In the past, Nigeria has depended largely on industrial and manufacturing sectors, as well as agricultural production and the export of cash crops like groundnut, millets, maize, cocoa and palm oil, which had a positive growth rate for its income, until oil was discovered in Nigeria.

Crude oil is the term for "unprocessed" oil, the substance that comes out of the ground. Crude oil is a fossil fuel, meaning that it was made naturally from decaying plants and animals living in ancient seas millions of years ago (in most places you can find crude oil were there once were sea beds). Crude oils vary in colour, from clear to tar-black, and in viscosity, from water to almost solid. Although, oil was used to keep fires ablaze in early human history, its importance in the world economy evolved slowly. Oil is of great importance to the world at large. Oil has become the world's most important source of energy since the mid-1950s. This is as a result of its relative abundance, high energy density and easy transportability to different areas. Additionally oil (in the form of petroleum) serves as raw material for many chemical products, including pharmaceuticals, solvents, fertilizers,

pesticides and plastics. It is also an energy source powering the vast majority of vehicles. Generally, oil is vital in industries and it accounts for a large percentage of the world's energy consumption. The world at large consumes 30 billion barrels (4.8km^3) of oil per year and top oil consumers largely consist of developed nations. This makes it one of the world's most important commodities (Wikipedia, 2009).

Oil consists of hydrocarbons, which include mostly alkanes, cycloalkanes and various aromatic hydrocarbons, while other organic compounds contain nitrogen, oxygen and sulfur, as well as trace amounts of metals such as iron, nickel, copper and vanadium.

The chemical composition of crude oil is given in the table below.

Table 1.1 Composition of crude oil by weight

Element	Percent Range
Carbon	83 to 87%
Hydrogen	10 to 14%
Nitrogen	0.1 to 2%
Oxygen	0.1 to 1.5%
Sulfur	0.5% to 6%
Metals	Less than 1000 ppm

This is the composition of crude oil by weight, although the exact molecular composition varies widely from formation to formation. However, the proportions of chemical elements vary over fairly narrow limits as indicated above (Wikipedia, 2009).

Crude oil may be found in porous rock formations in the upper strata of some areas of the Earth's crust. It is also found in semi-solid form mixed with sand and water. Crude oil could be classified in various forms for example, light crude oil, heavy crude oil, etc. each crude oil has unique molecular characteristics which are understood by the use of crude oil assay analyses in petroleum laboratories (Wikipedia, 2009).

Crude oil is sent to the refinery after it is removed from the ground, and at the refinery, different parts of the crude oil are separated into useable petroleum products. The petroleum industry is involved in this process, as well as with exploration, extraction, transportation and marketing of the entire petroleum product. The industry is divided into three major components, namely the upstream, midstream and downstream. Some of the products made from a barrel of crude oil, include Liquefied Petroleum Gases (LPG), heavy fuel oil, diesel, gasoline, etc (EIA, 2009).

According to Craig Freud Enrich (2009), chemists use the following steps in the refining of crude oil:

- The oldest and most common way to separate things into various components (called fractions), is to do it using the differences in boiling temperature. This process is called fractional distillation. You basically heat crude oil, let it vaporize and then condense the vapour.
- Newer techniques use chemical processing on some of the fractions to make others, in a process called conversion. Chemical processing, for example, can break longer chains into shorter ones. This allows a refinery to turn diesel fuel into gasoline depending on the demand for gasoline.
- Refineries must treat the fractions to remove impurities.
- Refineries combine the various fractions (processed, unprocessed) into mixtures to make desired products. For example, different mixtures of chains can create gasoline with different octane ratings.

The products are stored on-site until they can be delivered to various markets such as gas stations, airports and chemical plants.

1.1. Projected Rate of Production / Consumption in the World

The volume of the world's oil consumption is an ever-growing number. Note that a seemingly modest 7% growth rate results in a doubling of consumption every ten years. World oil consumption grew at a 7% rate from 1900 to 1973 (Reese, 1997).

Oil consumption in the developing world is currently skyrocketing:

- Taiwan's oil imports in January 1997 were up 60% over the previous year (Yang, 1997).
- Thailand's crude oil imports were up 36.9% in the first nine months of 1996.
- China's petroleum imports grew 37.5% in 1996 (XU Dashan, 1997).

The Energy Information Administration (EIA) projects that, at the current rate of growth, world oil consumption will rise 50% in the next 20 years (US DOE, 1996).

Oil provides 40% of the energy in industrial countries. Humans have searched for oil for over 100 years. Until 1962, the rate at which we discovered new oil was an upward curve, but 1962 was the peak of oil discovery. Since that year, the discovery of new oil deposits has been in a steady decline. When the OPEC oil embargo of 1973 sent prices up sharply, there was a tremendous increase in exploration activities.

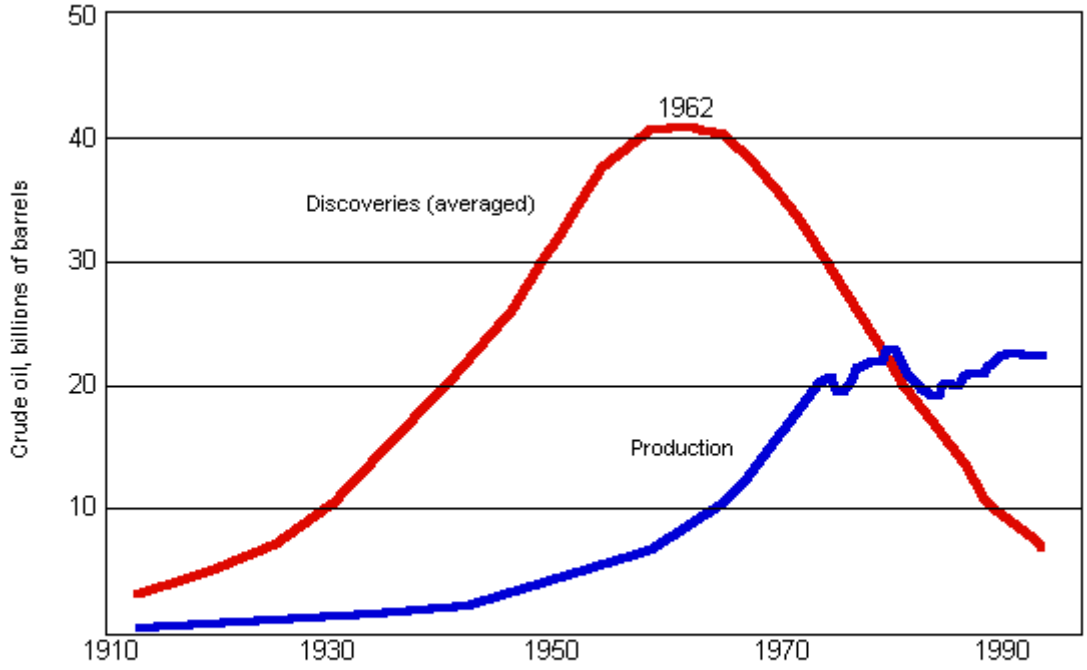

Figure 1.1 Crude Oil Discoveries and Production
Source: (Ivanhoe, 1995)

Although the discovery of new oil resources peaked three decades ago, the consumption of oil has continued to grow. In 1994, Petro consultants published a report on the future of the world's oil supply. Many large oil companies provide their own data to Petro consultants, on a confidential basis. Petro consultants are widely regarded to be the foremost authority for the global oil industry (Swenson and Francis de Winter, 1996).

Based on their information, the Petro consultants' report projected that "world oil production will peak in 1999 at 65.6 million barrels per day (mbpd) and then decline to 52.6 mbpd in 2010." They also stated that the peak will be coming soon, and it will be followed by a continuous and significant decline in production (OPEC News Agency, 1994: 2).

According to Joseph (1995), the projected production in 2010 is 52 mbpd. In contrast, based on current consumption trends, the projected rate of consumption in 2010 is in the neighbourhood of 94 mbpd (See Figure 1.2).

We're either going to have to find huge new deposits soon - which is essentially impossible - or we're going to see sharply rising prices, shortages, economic disruption, and so on and this may happen suddenly (Reese, 1997).

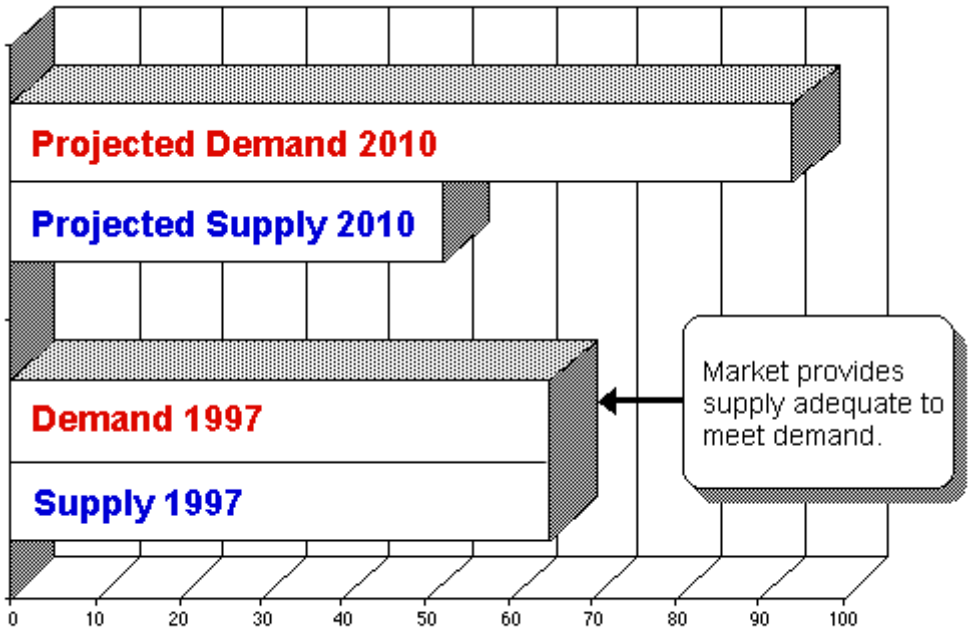

Figure 1.2 Oil Projected Supply and Demand in 1997 and 2010
Source: (Reese, 1997).

This means that the demand for oil will soon exceed the supply of oil. The rising curve of oil consumption is expected to cross the falling curve of production sometime between 2000 and 2010 (Reese, 1997).

Oil provides 40% of the energy in industrial countries. Oil is especially critical for agriculture, transportation, and the chemical industry. To a significant degree, oil is the engine that has driven the explosion in human population. The production of food, the price of food, and the availability of food are strongly dependent on oil (Reese, 1997).

Therefore, crude oil is of great importance to the world, and its products make life easier. Finding, producing, moving and using them have caused a lot of environmental degradation, social, and health impact. Some oil spill incidents around the world and the various impacts of the consequent affected environments are stated below:

- Guimaras oil spill: The oil spilled from the Petron, a chartered single hull vessel oil tanker in Nueva Valencia, Guimaras Island Philippines, which sank on Friday 11th August 2006, spilling 2.1 million liters of fuel oil. It caused a huge slick and has caused damage to the environment and livelihoods of the people (Greenpeace, 2006).
- Exxon Valdez oil spill: This occurred in Prince William Sound, Alaska, on March 24, 1989. It is considered as one of the most devastating human caused environmental disasters ever to occur at sea. The Vessel spilled 10.8million U.S. gallons (about 40 million liters) of Prudhoe Bay crude oil into the sea and the oil eventually covered 11,000 square miles (28,000km²) of ocean. This spill had both short and long term economic effects on the affected area by means of recreational sports, fisheries, reduced tourism (Wikipedia, 2009).
- Tanker Eltanin Spill: On March 1,' 2009, a 614ft tanker grounded off the shore of Sabine pass. The tanker was carrying 112,330 gallons of fuel oil, 44,859 metric tons of molten sulfur and 4500 gallons of diesel fuel. This spill has impacted the environment (Incident News, 2009).
- MT Hebei Spirit: A crane barge owned by Samsung collided with the M/V HEBEI SPIRIT on December 8, 2007, 10km (6.2miles) off the coast of South Korea and west of Tacan country. The M/V HEBEI SPIRIT sustained 3 large punctures and subsequently released an estimated 2.8 million gallons of crude oil. Over 160km (100 miles) of coastline has been impacted with the heaviest concentrations of oil being found in Teaen country and points 30 miles to the North (Incident News, 2009).

Oil Spills have greatly impacted the health, environment, political, social and economic lives of people in various affected countries. Some of the proven impacts of oil spills worldwide include:

- The acute **health effects** of the Tasman Spirit oil spill on residents of Karachi, Pakistan: On July 27 2003, a ship carrying crude oil ran aground near Karachi and after two weeks released 37,000 tons of its cargo into the sea. Oil on the coastal areas and fumes in air raised health concerns among people. A study was conducted consisting of a group affected by the spill, including adults living in homes on the affected shorelines and two control groups (A and B) who lived at a distance of 2km and 20km away from the sea respectively. It was found that the people suffered from itchy eyes, a scratchy throat, a sore throat, nausea/vomiting, headaches and general malaise were some of the commonly reported systems (Janjua, 2006).

- The **political impact** of the February 28, 1997 oil spill in Venezuela which took place in the middle of the night. A Greek tanker, the Nissos Amorgos, fractured its hull in the navigation channel of Lake Maracaibo. 25,000 barrels of heavy oil was spilled into the waters. The political and economic impact has led to the extent that it is now threatening to temporarily block the flow of oil from Venezuela to the rest of the world. The accident fractured the shield of impunity and incompetence with which government bureaucrats had been able to operate this vital navigation channel, through which 70 percent of Venezuelan oil is exported (Julio Cesar Centeno, 1997).
- The **social impact** of the Exxon Valdez, which occurred in March 1989. 11 million gallons of oil spilled into Prince William Sound, killing tens of thousands of wild creatures and fouling 1,300miles of beaches and surface water. The oil spill led to social conflict, cultural disruption and psychological stress in the people. There were also reportedly increased incidences of alcohol and drug abuse, domestic violence, mental health problems and occupation related problems (William, 1996).
- The **economic Impact** of oil spill on the Texas Coast, which occurred on 3, June 1979. This was the result of an exploratory oil well, the IXTOC 1, which blew out in the Bay of Campeche, Gulf of Mexico. The IXTOC 1 was the world's largest and most expensive oil spill (Restrepo *et al*., 1982).

  This event had a great effect on the local, state, federal and international economies. The IXTOC 1 oil spill was said to have reached the majorly affected regions during the height of the summer tourist season and incurred an estimated economic loss to recreational sectors of approximately three million dollars and a decrease of tourist activity in the sub region that totalled between 3.979 million to 4.444 million dollars. Thus the estimated costs of the IXTOC 1 oil spill to the private industry and government bodies earned it its name as (probably) the world's most expensive oil spill (Restrepo, *et al*., 1982).

1.1.1. Crude Oil in Nigerian Context

Crude oil was discovered in Nigeria in 1956 at Oloibiri in the Niger Delta after half of the century of exploration. The discovery was made by shell- BP, at the time of the sole concessionaire. Nigeria joined the ranks of oil producers in 1958 when its first oil field came on stream producing 5,100bpd. After 1960, exploration rights in onshore and offshore areas adjoining the Niger Delta were extended to other foreign companies.

Nigeria joined the Organization of Petroleum Exporting Countries (OPEC) in 1971 and established the Nigeria National Petroleum Company (NNPC) in 1977 a state owned and

controlled company which is a major player in both the upstream and downstream sectors (Blair, 1976: 2).

Following the discovery of crude oil by Shell D' Arcy Petroleum, pioneer production began in 1958 from the company's oil field in Oloibiri in the Eastern Niger Delta. By the late sixties and early seventies, Nigeria had attained a production level of over 2 million barrels of crude oil a day. Although production figures dropped in the eighties due to an economic slump, 2004 saw a total rejuvenation of oil production to a record level of 2.5 million barrels per day. Current development strategies are aimed at increasing production to 4 million barrels per day by the year 2010 (Odularu, 2007).

Petroleum production and export plays a dominant role in Nigeria's economy and accounts for about 90% of her gross earnings. The dominant role of oil in Nigeria has pushed agriculture, the traditional mainstay of the economy, from the early fifties and sixties to the background, as well as the country's over dependence on the oil sector, has led to a fall in other sectors like tourism, services - e.g. the transportation manufacturing and industry.
Oil is responsible for the greatest amount of environmental pollution in the country, especially in the oil producing areas. This is because Nigeria's oil industry consists of three major phases: Crude oil exploration, production oil refining, and petroleum product transportation and marketing (Amu, 1984).

The nature and scale of exploration, exploitation and transportation of oil in Nigeria, have increased the incidences of oil spillage. Surveys have shown in Nigeria an increasing number of recorded oil spills leading to the pollution of the environment. According to the National Environmental Study Action Team (NEST, 1991: 44), the greatest single environmental problem associated with petroleum exploitation in Nigeria is oil spillage, both onshore and offshore.

Oil spillage is one of the contentious issues facing the government, the oil industry and the host communities. All stages of oil exploitation impact negatively on the environment and the greatest single intractable environmental problem caused by crude oil exploration in the Niger Delta region is oil spillage. These oil spillages have occurred primarily in the main oil producing communities of the riverine areas of the Niger delta, in which the Ibeno Local Government Area of Akwa-Ibom state forms a part. Most of the inhabitants of Ibeno LGA are involved in agricultural activities which mostly involve farming and fishing. Thus the dominant areas for fishing consist of the creeks, rivers, swamps and mostly offshore fishing.

The socio-economic condition and rate of recovery from oil pollution can easily be projected from these occupational characteristics, if compared with situation under greater economic diversity.

Past oil spill incidents in Nigeria are shown in Table 1.2 below. Thus the rate of oil spills has since been rising with the increasing tempo of petroleum production.

Table 1.2 Nigerian government data on the number and volume of oil spills in Nigeria from 1976 to 1998 (Nwilo & Badejo, 2008).

YEAR	NUMBER OF INCIDENTS	VOLUME OF SPILLS (bbl)
1976	128	26,157
1977	104	32,879
1978	154	489,294
1979	157	694,177
1980	241	600,51
1981	238	42,722
1982	257	42,84
1983	173	48,351
1984	151	40,209
1985	187	11,877
1986	155	12,905
1987	129	31,866
1988	208	9,172
1989	195	7,628
1990	160	14,941
1991	201	106,828
1992	367	51,132
1993	428	9,752
1994	515	30,283
1995	417	63,677
1996	430	46,353
1997	339	59,272
1998	390	98,345
TOTAL	5724	2,571,113.90

These spillages have occurred primarily in the main oil producing communities of the riverine areas of the Niger Delta, of which Ibeno LGA of Akwa Ibom State forms a part. Before the inception of oil exploration and subsequent exploitation in this area, Ibeno people indulged in agricultural activities, trading, hunting, teaching and fishing, while others made a living from indigenous industries or crafts, such as distilling of alcoholic beverages, called “Kai Kai”, tapping of palm wine and so on. The farmers in Ibeno LGA had very high returns because their land was very fertile and wholesomely productive and their rivers were richly blessed with fish and shrimps, but the reverse is the case today.

The environmental degradation of the oil rich Niger Delta, of which Ibeno is a part, has been wanton and continuous with dire health, social and economic consequences for its people. Oil exploration and production in Ibeno LGA, has led to a lot of environmental problems, some of which include:

- Contamination of Streams and Rivers: In the course of oil exploration and production in this area, various materials are released into the environment. For example, during exploration, drill cuttings, drill mud and fluids are used for stimulating production and all this contaminates the environment, mostly streams and rivers, thus rendering the water polluted and unusable for the community (Nwankwo and Ifeadi, 1988: 58-64).
- Forest Destruction and Bio-diversity Loss: Oil exploration and production process have led to the destruction of forests, as well as bio-diversity loss in this area. This is because the major constituents of drill cuttings, such as barites and bentonite clays, when dumped on the ground, prevent plant growth. In water, according to Nwankwo and Ifedi (1988), these materials disperse and sink, killing marine animals. Also, oil spilled in this area has a great effect because its toxicity adversely affects the soil, plant, animals and water resources (Ikporukpo, 1988: 79).
- Oil spills have degraded most agricultural lands in the Ibeno area and have turned hitherto productive areas into wastelands. With increasing soil infertility due to the destruction of soil macro-organisms, and dwindling agricultural productivity, farmers have been forced to abandon their land to seek non-existent alternative means of livelihood. Aquatic lives have also been destroyed with the pollution of traditional fishing grounds, exacerbating hunger and poverty in the fishing community (Odjuvwuederhie, *et al*., 2006: 42).

  This is the area of emphasis that my research tends to explore in totality.
- Social Impact: Oil extraction has impacted most disastrously on the socio-economic and physical environment of the Ibeno community. This oil producing community has basically remained dependent and underdeveloped, persistently disempowered.
- Socio-culturally Marginalized and Psychologically Alienated. The wealth derived from oil resource exploitation and exports benefit directly only the operators of the oil industry and the bureaucrats in government (Owabukeruyele, 2000: 6).

  Enormous money had been derived from oil export, but the area has been subjected to severe land degradation, socio-economic disorganization, increasing poverty, misery, military occupation and bloody violence (Peggy, 1999: 14).

  Another social impact of oil spill as a result of crude oil exploitation and exploration over the last four decades is the fact that it has also instigated and intensified bitter

and bloody conflicts between emerging interest groups within and between communities and villages, as well as conflicts between oil companies and their host communities. Generally, these conflicts range between elite groups and between youth organizations on one hand and between the urban resident elite and the village community resident on the other scale. There are also conflicts between the Trans-national oil companies, the government, the community and their expropriated inhabitants (Owabukeruyele, 2000: 7).

These conflicts that have emerged in the Ibeno LGA, because of the extraction of oil, have their roots in the violation of the rights of the local community people – the result of promulgation of obnoxious legislations. This has inevitably led to greater poverty and landless groups of people whose basic sustenance as peasant farmers have been negatively affected as a result of oil extraction for export (Owabukeruyele, 2000: 7).

In addition, violent and disruptive, as well as bloody, conflicts in this area are as a result of the fact that the deprived peasants currently make demands for social services from the oil companies, rather than the often inaccessible Nigerian State. This has often led to conflict as the oil companies are engaged in the process of collaborating with the Nigerian regime to use violence as a means of pacifying the protesting community (Peggy, 1999:14).

Generally, benefits derivable from the oil companies located there, as well as the struggle for land ownership and territorial expansion has also provided the proximate cause of conflict in the area.

- Health Impact: When oil spills occur, the community as well as the oil company workers can be exposed to it, through inhalation, dermal or direct impact. The dermal and inhalational routes of exposure tend to produce exposures to different components of crude oil. In order words, people may be dermally exposed to both volatile and nonvolatile components, some of which are capable of being absorbed through the skin causing skin irritations or dermatitis. The obvious source of inhalation exposure is volatile chemicals, of which the main classes are alkanes, aromatics and sulfur compounds (Park and Holliday, 1999: 115).

  The health effects associated with the exposure of crude oil includes the overt signs of acute intoxication in humans – dizziness, nausea, shortness of breath, headaches, fatigue in coordination, as well as irritation of the eyes, which the people of Ibeno LGA have complained of. It has also been found that prolonged exposure to high

doses of these compounds lead to irreversible bone marrow damage, causing aplastic anaemia and leukemic diseases (Park and Holliday, 1999: 120).

Therefore, putting all this into consideration, it is necessary that alternate sources of income generation be explored. In order to generate income or revenue the government should harness the country's potential in other sectors like agriculture, e.g. assisting farmers to plant varieties of crops (corn, groundnut guinea, wheat, rice, cocoa, rubber, palm oil, etc.) and providing them with protectitive chemicals to assure a bumper harvest. Other potential income sectors include tourism, services (e.g. transportation), industrialization and manufacturing (e.g. textiles). All of these will help to improve the economy as well as provide the federal government with revenue – a much better alternative to an unhealthy dependence on crude oil.

The concern over the state of the environment has transcended the corridors of the industrial nation and has become an international issue since the IDGOS conference on Human Environment held in Stockholm, Sweden in June 1972, where Nigeria participated. It was decided that: "Both aspects of man's environment, the natural and manmade, are essential to his well being and to the enjoyment of basic human rights, even the right to life itself, to defend and improve the human environment for present and future generations. This has become an imperative good for mankind" (Etuk, 1977: 21).

From this, the issue became clear that sustainable development techniques were what the oil industries needed since their activities of exploration and exploitation could not be stopped in the light of developmental needs. And this can be effectively done through the instrumentality of law. This research work, therefore, is aimed at investigating the impact of oil spillage on agricultural production in the riverine areas of Ibeno Local Government Area of the Akwa-Ibom State, which is one of the areas where oil production is pursued. It will also take into cognizance the health, socio-economic, political and environmental effects on the host community.

1.2. BACKGROUND OF THE STUDY AREA

The area under study is the Ibeno Local Government Area located in the Niger Delta region of the Akwa Ibom State in Nigeria. The Niger Delta region consists of nine states which make up the south-south geopolitical zone in Nigeria, of which the Akwa Ibom State is a part. It extends over an area of about 7.5% of Nigeria's total landmass and the coastline extends for 560km, roughly two-thirds of the entire coastline of Nigeria, of which Ibeno L.G.A is a part (NDDC, 2004).

The Ibeno clan consists of twenty-three villages; it stretches for about forty kilometres from Ikot-Abasi in the West to the mouth of Cross River in the East. It is bordered by Oron and Eket East in the North East and by Eket Central and Oniong Eket in the North West, as well as by the Atlantic Ocean in the South. It lies between the latitudes 8.00" and 8.15" East of the Greenwich Meridian. It is located in the transitional zone between the swamp forest and the rainforest region.

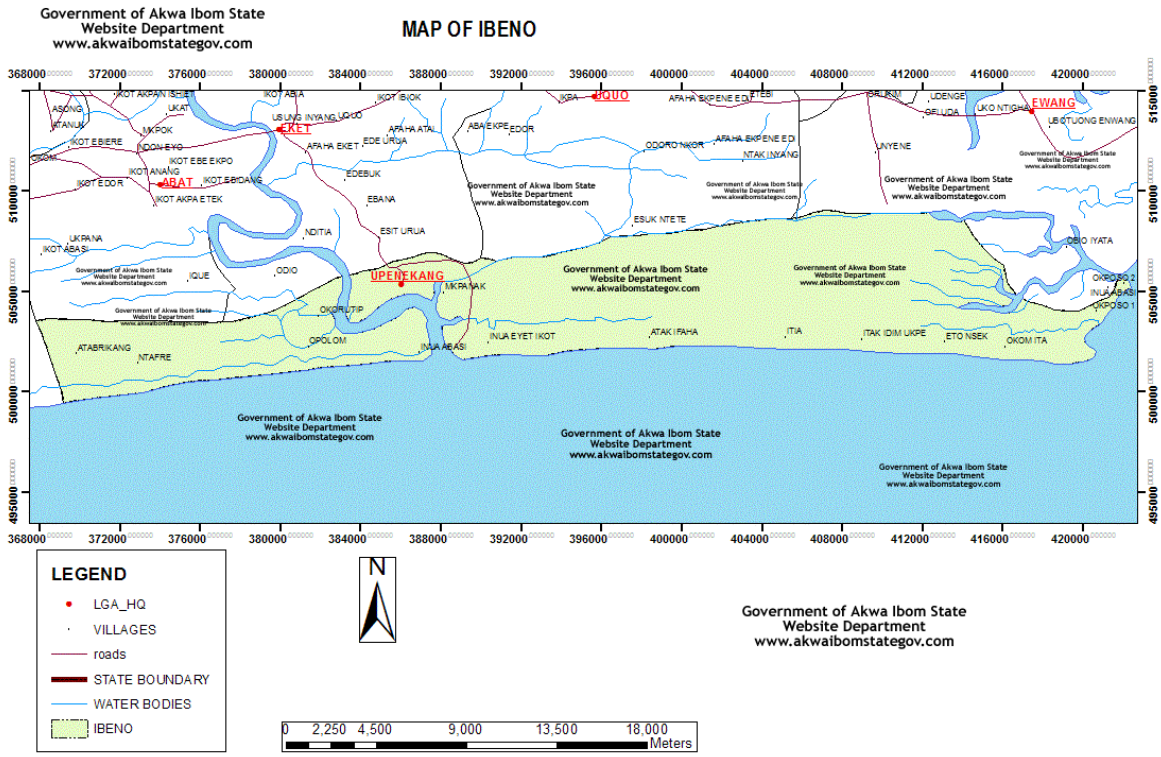

Figure 1.3 Map of Ibeno Local Government Area of the Akwa Ibom State

Ibeno is divided into two sub areas by the Qua Iboe River. The area across the river is made up of six villages. Most of the villages are further separated from one another by small creeks and marshland. The area lies about ten metres above sea-level and houses occasional creeks and sand banks. The original thick mangrove swamp is giving way in some places to scanty bushes due to the effect of pollution (Etukudo, 1983).

The Qua Iboe River and the Atlantic Ocean constitute natural waterways and the most important traffic route in the area. Many paddle canoes, engine boats and ships make use of

it. The mouth of the Qua Iboe River is about 100 metres wide and its estuary is about 39 kilometres wide at its entrance.

The physical conditions of Ibeno significantly influence the economic activities of the people; the activities of the oil companies have also influenced the economic life of the people. The principal occupation of the people is agriculture, such as farming and fishing.
According to the 2006 National Census in Nigeria, Ibeno is made up of 75,380 people; which comprises of 41,311 males, and 34,069 females (AKSG, 2008).

Oil spillage is the main hazard in this area, but other hazards in Ibeno community include gas flare, community conflict, deforestation, and floods. Some of these hazards are caused as a result of the operations of the oil company. These are the major issues facing the government, the oil company and the host community. The rate of oil spills have been rising with the increasing tempo of petroleum production in Nigeria, of which the Ibeno community is a part, and this issue needs to be addressed in order to improve and sustain the lives of the indigenous people in this community, as well as to reduce vulnerability to disaster in this community.

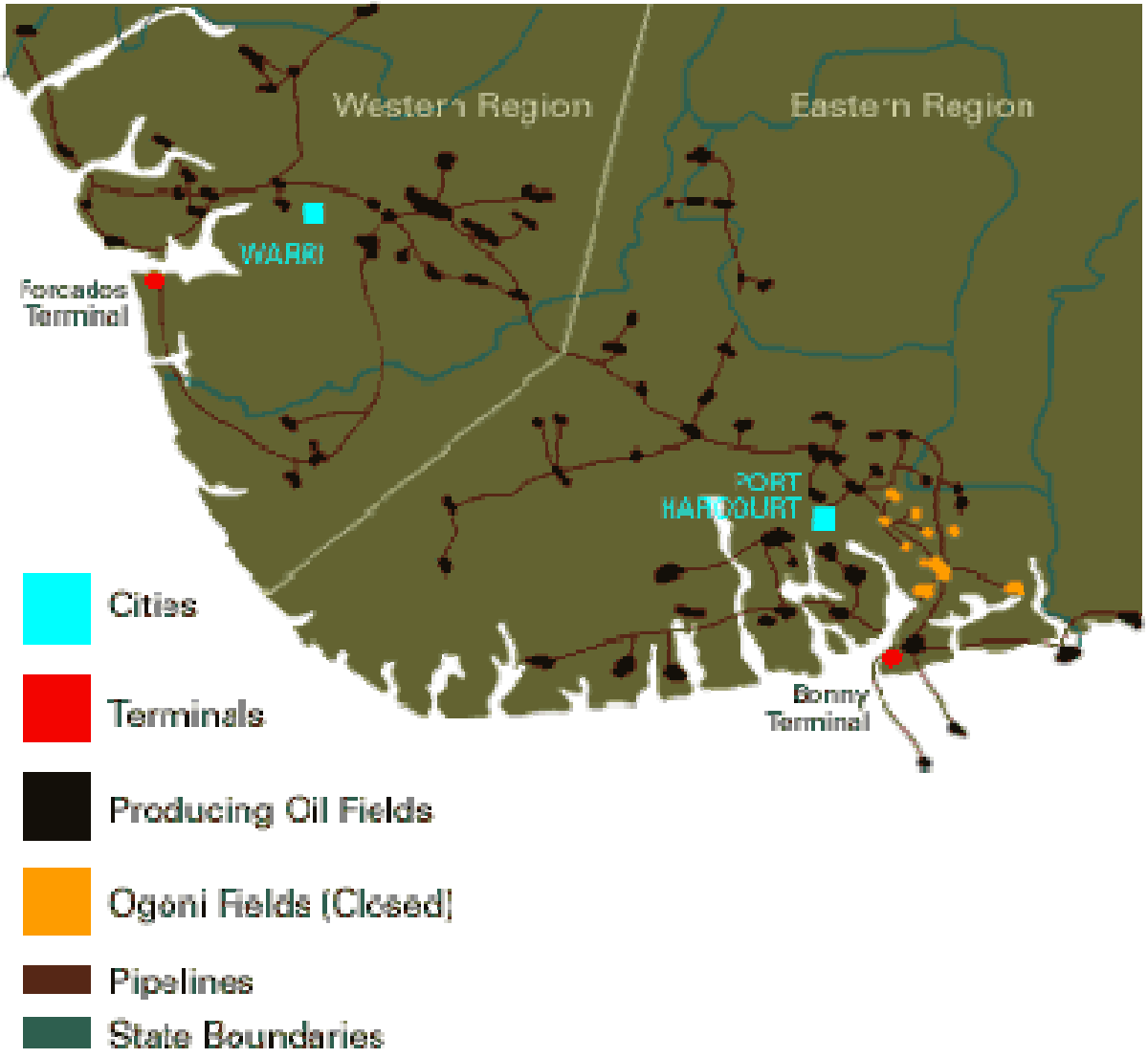

Figure 1.4 Map of Niger Delta Showing Oil Fields and Pipelines (Ekeh, 2009)

1.3. PROBLEM DESCRIPTION

In Ibeno L.G.A, prior to the discovery of oil, the people made their living from exploitation of the resources of the land, water and forest as farmers, fishermen, and hunters. Conscious of the critical position of the environment to their sustenance and their future generations, the people of the Ibeno community were very attached to their environment. The discovery of oil understandably raised the hopes of the people for development. In their innocence, they believed that the Nigerian state and the oil companies were equally interested in and committed to their development. They soon found out that this was not the case, and that the two shared a common interest in the maximization of profit and the accumulation of capital at any cost, hardly their welfare or development (Owugah, 2000).

Therefore with the discovery of oil in this area, all activities including agricultural pursuit became peripheral and subservient to oil exploration activities, as has been extensively mentioned above.

In the Ibeno community, oil spills are a direct consequence of crude oil production and therefore man made. They may also result in changes to both the landscape and the socio-economic activities in the area. Spills may also result because of faults at any stage of the production and movement of crude, as products involve many mechanical processes, the continued efficiency of which may not be guaranteed.
Jike, (1987) has argued rather trenchantly that although oil companies have made enormous profits in the country, these companies have contributed minimally to the country's development.

In Ibeno, oil spills have posed a major threat to the environment, which has led to total annihilation of the ecosystem. Thus, life in this area is becoming increasingly unbearable due to the ugly effects of oil spills (Oyem, 2001). Intermittent oil spillages have rendered vast stretches of indigenous farmlands useless. Therefore as important as oil might seem to the nation's economy, the people perceive the discovery of oil as a threat to their life-support system – the land.

However, on Monday, January 12th, 1998, the 24 – inch pipeline from the IDOHO platform to the Mobil Qua Iboe terminal ruptured, resulting in the release of approximately 40,000 bbl (approximately 6000 tons) of light Nigerian crude oil into the environment (Olagbende, 1999).
Oil being lighter than water formed slicks which spread over the surface of the ocean, influencing surface tension, viscosity, pour point (i.e. temperature of solidification) wind, currents and waves. Within days, the oil spread swiftly with the current, covering the entire Ibeno water area up to the shores, and moving westwards, reached the Lagos Five Cowrie Creek on the 25th January 1998. A vast array of agricultural farmlands and products were destroyed, causing fish genocide and destroying other environmental resources, as well as affecting the health and general living conditions of the people living in this community and its environs.

This particular oil spill had a serious impact on the vegetation and wildlife to the extent that plants could no longer bear its traditional fruits and those making a living from the

sea resources were stranded. Thus in most cases, such damage is temporary and is caused primarily by the physical properties of oil creating nuisance and hazardous conditions. The impact of this oil spill has also led to a situation where the Ibeno people, who have been known to be the friends of their environment, used raffia palms bamboo and other forest resources to make their houses. Now they are forced to use cement and corrugated iron sheets for their houses. This is because there are no longer healthy forest and swamp resources for building their conventional and convenient houses. Many of the plants and the tree spices have died off, while others are largely dwarfed as a result of the highly toxic ecosystem in which they now find themselves.

In Ibeno environment, large areas of the mangrove ecosystem have been destroyed. The mangrove was once a source of both fuel woods for the indigenous people and a habitat for the area's biodiversity, but is now unable to survive the oil toxicity of its habitat. Also, the intricate crisscross of oil exploration pipelines and rig facilities within this community displaced farmsteads and farmers. Thus, virile young men found themselves out of work and began to swell the bloated labor market.

The discovery of oil in this area, coincided with the boom years of agricultural production, but agriculture fell out of reckoning in its appeal because of its relatively longer gestation period (Jike, 2001). Productive farmlands have been lost to oil production operations in the Ibeno community, as excessive oil exploration and seismic activities in the area have had negative reverberations for soil toxicity and quality of crops. There is a general concern among environmentalists that the quality of crops in this area, is rapidly deteriorating. The quality, size and shape of traditional staples such as the cassava, yam, and plantain, are adversely affected by the continuing forage for oil without the requisite Environmental Impact Assessment (EIA) (Akoroda, 2000).

Jike, (2002a) noted that the prevailing odds trumped up by the deleterious consequences of oil spillage that are a direct negation of the fundamental concept of sustainable development, is contrary to development that meets the needs of the present without compromising the ability of future generations to meet their own needs. In order words, the frequent accidental release of crude oil into the Ibeno environment is causing a lot of degradation to their source of livelihood. This includes the forest, wetlands, rivers, swamp streams, ponds and fisheries resources. Thus the impact on marine life is compounded by toxicity and tainting effects resulting from the chemical composition of the oil, as well

as the diversity and variability of biological systems on their sensitivity to oil pollution. Another negative effect of this oil spillage and other oil exploration activities in this area is its effect on wildlife, which has precipitated forced migration of a wide range of apes, especially monkeys that were highly visible and ubiquitous within this area before the advent of oil exploration (Jike, 2001).

The spill is generally having a negative consequence on human health, due to the consumption of contaminated seafood.

Akoroda, (2000), indicated that an emergent trend of carcinogenic diseases in this area is traceable to the exposure of these people to the radioactive elements of gas flaring, which is as a result of oil exploration and production in this area. The people are beginning to develop symptoms of bronchial and respiratory diseases. An air volatile fraction through evaporation processes of the oil, has adversely affected respiratory functions. These include impaired lung function as measured by Spiro metric studies, chemical bronchitis, tracheities, bronchoconstriction, visual irritation and skin reactions, which are also common. Other effects include loss of fish traps, fishing nets, hooks, fishing gear and other fishing implements. Adding to the list is the loss of harbor space and shore space, unbalanced competition for land and marine services, displacement of capital and labor market, and navigational interruptions, thus, setting imbalance in the livelihoods of the people (Etuk, 1977).

Culturally, the oil spill had desecrated the sacred streams, evil forests, Juju Shrines and deities. Sometimes, ancestral homelands have been desecrated, thus serving the link between the living and the pantheon of forbears (Jike, 2001).

The sources of water supply (for drinking, agricultural activities and other purposes), such as boreholes and streams, have also been polluted, rendering them undrinkable due to unacceptable taste and odour, thus leading to failing health standards and diseases like chemical gastroenteritis. Also owing to the extensive use of shorelines and near shore areas by humans, there have been considerable social and economic losses, as tourism and recreation have been hampered.

The most significant and disturbing to the Ibeno indigenous are the adverse effects on the degradation of the environment, thereby leaving those who are earning a living from

the environment jobless. This has resulted in a drop in morality, disruption of family peace, anti-social ways of life, like robbery, prostitution, drunkenness and other forms of immoral behavior. In other words, others are just not willing to sit it out on the dole offered by extended family members or resort to defensive mechanisms as stated above.

According to the indigenous of Ibeno, their sources of livelihood have pervasively been destroyed by the activities of the oil companies, with deliberate delay in the payment of compensation and royalties which are usually highly politicized. As such, there has been increased vandalization of oil installations by the host communities, since the compensation most times does not even get into the hands of those it is meant for and in some cases nothing is paid at all. It is therefore the aim of this study to investigate and evaluate (these views) as well as the impact of oil spills on agricultural production on the people of the Ibeno Local Government Area.

1.4. RESEARCH OBJECTIVE

The main purpose of this study is to examine, highlight, and understand the devastating impact of oil pollution on agricultural production in Ibeno L.G.A. Sub-objectives of this study is to:

- examine the social, cultural and economic impact on the life of the Ibeno people;

- Ascertain the extent of damage done by the petroleum industry to the environment of their area of operation and how this damage has influenced the people culturally and psychologically.

1.5. SIGNIFICANCE OF THE STUDY

The research findings would enable individual, community, government, policy makers and organizations involved in or affected by oil spillage and oil production activities, to be enlightened with regards to industrial waste management, environmental protection, sustainable development, health care delivery, standard of living of people of affected communities, provision and management of social infrastructure. It aimed to shed more light on social activities of individuals in the area and create awareness on the importance of individual hygiene and sanitary conditions. The study was important, in that it also helped to educate the people on the needs and importance of peaceful co-existence amongst the host community and organizations operating within the area, and

also provide data to other researchers studying oil pollution problems in Ibeno, and other oil producing communities across the country and world at large.

Concerning economic importance, Nigeria as a nation earns huge foreign exchange amounts from oil exploration in contrast to the above, where there exists risk, danger and hazards to communities playing host to these oil companies that deal with the actual exploration, exploitation and production of oil and equipment.

The social economic life of the Ibeno indigenous is highly influenced by activities of the industrial operation there. They have poor road networks and some of their roads have been destroyed by heavy duty oil company vehicles. Occupations, such as farming, may not be carried out due to wholesale land acquisition by these companies and incessant oil spillage through their operations which my study has uncovered.

At the Ibeno axis of the Akwa Ibom State, where crude oil is drilled, the major oil company that deals with the actual exploration and exploitation of oil is Mobil Producing Unlimited. There are many other oil servicing companies both upstream and downstream. Thus, this difference in operation brings about danger, hazards and risk to the community and even the workers, with regards to air pollution via gas flaring (which has been another attendant effect of oil production), toxic industrial waste, oil spillage, destruction of crops and forest reserves, destruction of arable farmlands and water pollution, which also leads to the destruction of aquatic life and outbreak of epidemic diseases.

This research has aided in excavating the good and bad sides of oil exploration, exploitation and production activities in our communities. It would also treat most problems concerning the impact of oil spillage on agricultural production, as well as the socio-economic impact on the well being of the Ibeno people, its environs and other communities of similar fate.

1.6. RESEARCH QUESTIONS

1. To what extent does oil spillage affect agricultural production of Ibeno land?
2. What are the major causes of oil spillage in Ibeno LGA?
3. To what extent are socio-economic activities affected by oil spillage.
4. To what extent do oil royalties affect socio-economic development?
5. To what extent does crude oil exploitation cause environmental degradation?

6. To what extent has oil spillage affected the vegetation, farmlands, and health standard of the Ibeno people?

1.7. LIMITATIONS OF THE STUDY

With the combination of various issues affecting the needs of both the rural dwellers and industrialists to utilize local resources for their economic activities, there has been a significant impact upon the ability of rural dwellers to ensure a sustainable means of meeting their needs. In order words, the limitations of this study included:

1.7.1. TRANSPORTATION: Lack of transport routes, affected the proposed study, as very few car routes exist, and also considering the recent condition of the land in Ibeno LGA. (e.g. inaccessible road conditions) and water conditions in the area, as the Ibeno community is mostly surrounded by water and they are no engine boats apart from small canoes, which were used to transport people from one village to the another. This was also considered as being very dangerous as most boats in this community usually capsize. This affected the proposed study, as well as affected the completion of the research work, in the expected time duration, as the area of research was some kilometers away from where the researcher resided.

1.7.2. TELECOMMUNICATION: Telecommunication systems (computers and mobile phone reception or networks) failure, as a result of the topography of the area, as well power failures, etc. This hampered the effectiveness of data collection in this community. In addition to the above-mentioned limitations, are **poor funding or resource limitations**.

1.7.3. LANGUAGE BARRIER: The various languages, beliefs, and culture of the people of Ibeno as well as the interaction and attitudes of the people towards the researcher caused communication problems that led to difficult situations during data collection. All of these factors have hindered the release of adequate and useful information from the community to the researcher. This could affect the research information or data obtainment and interpretation.

1.8.ETHICAL CONSIDERATION

This includes the ethical considerations of the people of Ibeno LGA. The culture, beliefs, educational level, language, type of livelihood activities, socio-economic status, interaction with and attitudes towards the researcher. The privacy and confidentiality of all information as well as the culture and respect for each participant in the community, was upheld to the maximum. Also considering the political and psychological nature of the

impact of oil spillage and what it means to this community, permission to carry out the study was sought from the appropriate community leaders and informed consent obtained from the participants without coercion.

CHAPTER 2

LITERATURE REVIEW

2.1. INTRODUCTION

Petroleum production and consumption, especially in the Ibeno LGA of the Akwa Ibom State, has probably brought out both the best and worst of modern civilization in Nigeria. It has contributed enormously to the country's economic growth and, on the other hand, has left a profound adverse impact on the natural environment and has also generated a number of other socio-economic concerns including human rights issues.

The economic benefit of crude oil exploration and production in the Ibeno LGA both onshore and offshore have been so overwhelming that until quite recently, the adverse ecological devastation, socio-economic impact and environmental deterioration in this community were overshadowed. In spite of the immense wealth accruing from crude oil, extensive damages of farmlands, forest, streams and creeks and the persistent threat to health of the inhabitants of this region have been ignored (Hassan, *et al*., 2002).

The relationship between the community and oil industries, according to many observers and analysts, leaves much to be desired. A lot of investigations have been carried out by scholars, non-governmental organizations (NGOs) and professional bodies on environmental pollution generally and oil spill related cases, in particular in Ibeno LGA, some which will be discussed doing the course of this work.

Since the current study seeks to investigate the impact of oil spillage on agricultural production, a case study of Ibeno LGA of Akwa Ibom State in Nigeria and the sub-topics that will form a framework for the entire review of literature to be covered by the study, will entail the following: a definition of the concept of oil spillage; history of oil and its exploration in Nigeria; causes of oil spillage; the ecological effects of the oil industry on the environment; the impact of oil spillage on environmental quality; the impact of oil spillage on agricultural production; the impact of oil spillage on health, economic and social life of the people; oil company relations with the oil producing communities; oil royalties and social development.

2.2. THE HISTORY OF OIL IN THE WORLD AND ITS EXPLORATION IN NIGERIA

Historically, Edwin L. Drake, could be regarded as the pioneer in the field of oil exploration, while 1859 serves as the beginning of the modern petroleum industry. The most important

oil well ever drilled was in the middle of Quiet – farm, country in northwestern Pennsylvania in 1859 (Paleontological Research Institution, 1932).

Drilling began in the summer of 1859, although there were many problems with the oil well, and progress was slow and financially costly. On August 27, 1859, Drake and the driller, Billy Smith, drilled to a depth of 21.18m (69 ½ feet). It wasn't until the next morning that they noticed oil floating in the hole they had pulled the drilling tools from the night before. By today's standard, it was a pretty unremarkable hole, probably producing 20 barrels or less of oil per day. This was one of the first successful oil wells that were drilled for the sole purpose of finding oil. It was known as the Drake well, after Edwin Drake, the man responsible for the well (Paleontological Research Institution, 1932).

The beginning of petroleum exploration in Nigeria dates back to 1903 when the British Mineral Survey Company began mineralogical studies of the country. The search for petroleum continued in Nigeria until the first commercial oil well was struck in 1956 at Oloibiri in the Rivers State, after half a century of exploration. The discovery was made by Shell-BP, at that time the sole concessionaire. Nigeria joined the ranks of oil producers in 1985 when its first oil field came on stream producing 5,100 bpd (NNPC Annual Report, 1986).

By 1961, the Shell B.P successes attracted the influx of other oil companies namely Mobile oil company, Gulf Termaco, Agip, Satrap (now Elf) and Amoseas (now Texaco/Chevron). By the late sixties and early seventies, Nigeria had attained a production level of over 2 million barrels of crude oil a day (NNPC Annual Report, 1986).

In Ibeno LGA, and its environs, crude oil exploration started in the late 1960's, and was stated by Mobil Oil Company (Leton, 2006).

Mobil was the major operator in this area. The Qua Iboe Terminal (QIT), (its operational base) it's located and operated by Exxon Mobil. Ibeno surrounding is generally dominated by oil operations, some of which include exploration activities and seismic work. Long before the exploration and production of crude oil in the Ibeno area, the QIT was totally a virgin territory (forest) and was dominated by animals like elephants.

In Ibeno LGA, Mobile, which is the major oil prospecting and producing company, is located on an 810 acre site on the coast about one kilometre East of the Qua Iboe River. The terminal facilities became operational in October 25, 1971, when crude oil was first received into onshore tanks. Mobile and NNPC have spent about N115 billion drilling 278 wells of which 137 were producing oil in 1985. The daily production rate from 16 fields on streams is

about 240,000 barrels. There are 37 multiple well platforms from which crude production flows to seven production platforms. At these platforms the crude oil flows into primary separators where gas is separated from the crude and flared nearby (NNPC Annual Report, 1986).

The crude oil is then pumped through the pipeline network into the terminal facilities where atmospheric separation of the remaining associated gas takes place and the degassed crude is delivered into the terminal storage tanks. Figure 2.2 below, shows a picture of oil pipelines and how rusty they look.

Figure 2.1. Crude Oil Pipe lines in Nigeria
Source: (Obi-Akpere, 2006)

There is a gas injection platform at Asobo, which contains turbines driven centrifugally and reciprocating gas, which is used for partial pressure maintenance and to supply fuel to the main power plant turbines. Crude oil treating facilities removing basic sediments and water to acceptable levels for export are provided at the terminal (NNPC Annual Report, 1986).

Clean crude for export is stored and fiscalized in seven 500,000 barrels of floating roof ranks. The treated oil is transported by pipe for export. Generally, petroleum production and export play a dominant role in Nigeria's economy and accounts for about 90% of her gross earnings. The dominant role has pushed Agriculture, the traditional mainstay of the economy from the early fifties and sixties, to the background (NNPC Annual Report, 1986).

2.3. OIL RESOURCE EXPLOITATION AND PRODUCTION IN THE NIGER DELTA

The effect of oil resource extraction on the environment of the Niger Delta has had a lot of negative effect on the region. Eteng (1997: 4) stated that "Oil exploration and exploitation has over the last four decades impacted disastrously on the socio-physical environment of the Niger Delta oil-bearing communities (of which Ibeno LGA is a part), massively threatening the subsistent peasant economy and the environment and hence the entire livelihood and the basic survival of the people."

While oil extraction has caused negative environmental problems in this area, the Nigerian State has benefited immensely from petroleum since it was discovered in commercial quantities in 1956 (Adabanwi, 2001). The Central Bank of Nigeria (C.B.N) 1981 annual report stated as follows:

"Oil which was first discovered in 1956 and first exported in 1958 accounted for more than 90% of Nigerian exports by value and about 80% of government revenue as at December 31, 1981… The overall contribution of the oil sector to the national economy also grew from an insignificant 0.1% in 1959 to 87% in 1976."

Nigerian oil industry has affected the country in a variety of ways and also on the other hand, it has fashioned a remarkable economic landscape for the country. However on the negative side, petroleum exploration and production also have adverse effects on fishing and farming, which are the traditional means of livelihood of the people of the oil producing communities in the Niger Delta, Nigeria, of which Ibeno is a part (Worgu, 2000: 3).

Therefore, if the oil industry is considered in view of its enormous contribution to foreign exchange, it has achieved a remarkable success. On the other hand, when considered in respect of its negative impact on the environment and socio-economic life of the immediate oil bearing local communities and it inhabitants, it has left a balance sheet of ecological and socio-physical disaster.

2.4. OIL PRODUCTION FOR EXPORT IN NIGERIA

Nigeria, like most other less developed countries in the part of the 70's, was engaged in intensive natural resource exploitation as a way of stimulating economic growth. It was projected by several multilateral funding organizations such as the International Monetary Fund (IMF) and the World Bank that export drive of primary resource materials will eventually lead to economic growth and subsequently a significant reduction in the level of poverty. The

projection was that the long-term gain of such a process would set the stage for a sustained economic development (Worgu, 2000: 4).

As at 1976, about 10 years from the start of the oil export drive, figures available from the Federal Office of Statistics stated that oil has accounted for about 14% of the nation's gross domestic product (GDP) of Nigeria – 95% of the total export and over 80% of government annual revenue. Total export peaked at two million barrels of crude oil per day with a price range of $ 18 -$22 per barrel. This created more opportunity for the development of new oil fields increased granting of mining licenses and the intensive exploitation of oil mineral resources in Niger Delta (Worgu, 2000: 4).

The multinational oil companies made huge investments in the oil sector, which was quite technologically and capitally intensive. New laws were made which include the Petroleum Act of 1969 and the Land Use Decree/Act of 1978. This legislation regulated community access to communal or open access land and they were primarily promulgated to restrict access to such land, while at the same time making it possible for the multinational investors to have unrestricted access to explore oil unchallenged even on sacred land.

2.5. CAUSES OF OIL SPILLAGE

The introduction by man, directly or indirectly, of substances or energy into the environment can result in such deleterious effects that are harmful to living organisms and pose hazards to human health, distortion of agricultural production, cause hindrance to marine activities including fishing, impair water quality, Et cetera.

Oil spills are discharges of oil (crude or refined) into the environment which normally occurs as a result of an accident caused by the malfunctioning of equipment or through human error.

In Nigeria, fifty percent (50%) of oil spills is due to corrosion, twenty eight percent (28%) to sabotage and twenty one percent (21%) to oil production operations. One percent (1%) of oil spills is due to engineering drills' inability to effectively control oil wells, failure of machines, and inadequate care in loading and unloading oil vessels (Badejo and Nwilo, 2004).

The main causes of oil spillage in Ibeno LGA could be attributed to the following:

- **LEAKAGE / FAULTY FACILITY:** Thousands of barrels of oil have been let loose into the environment through oil pipelines and tanks in Ibeno LGA and generally in the country. This loss is basically as a result of lack of maintenance of the pipelines and

storage tanks. Most pipelines from the flow stations are obsolete. By international standards, oil pipes ought to be replaced after 15 to 20 years, but most pipelines in use are 20 to 25 years old, making them subject to corrosion and leakage. Some of these pipes are laid above ground level without adequate surveillance, exposing them to wear and tear and other dangers (Oyem, 2001).

- **NATURAL CAUSES:** Oil spillage could occur as a result of natural causes; they are causes which are not manmade or induced thus, occurring without any fault of man. This includes flood, rain, Et cetera.
- **SABOTAGE:** A high percentage of oil spillage results from sabotage. Sabotage is a major cause of oil spillage in the country, especially in Ibeno LGA of Akwa Ibom State. Some of the citizens of this country in collaboration with people from other countries engage in oil bunkering. They damage and destroy oil pipelines in their effort to steal oil from them. Pirates are stealing Nigeria's crude oil at a phenomenal rate, funneling nearly 300,000 barrels per day from Nigeria's oil and selling it illegally on the international market (Badejo and Nwilo, 2004).

  According to Badejo and Nwilo (2004), illegal fuel siphoning as a result of the thriving black market for fuel products has increased the number of oil pipeline explosions in recent years. In July 2000, a pipeline explosion outside the city of Warri caused the death of 250 people. The NNPC reported 800 cases of pipeline vandalization from January through October 2000. In January 2001, Nigeria lost about $4 billion in oil revenues in 2000 due to the activities of vandals on the oil installations. Nigeria lost about N7.7 billion in 2002 as a result of vadalization of pipelines carrying petroleum products. The Nigerian government and oil companies say up to 15 percent of the country's two million barrels per day oil production is taken illegally, taken from pipelines in the state and smuggled abroad.

Generally, oil spillage occurs during crude oil production, refining, marking and transportation of crude and refined products. Despite all the factors mentioned above, records shows that the majority of the spills that occurred are man made mistakes which were avoidable. The two outstanding cases are, the Funiwa – 5 oil well blow-out of 1980 spilling 400,000 barrels of crude into the marine environment as well as the January 12th, 1998, oil spill, at the Mobil's Qua Iboe Terminal Akwa Ibom State, where about 40,000 barrels of oil were spilled (Aghalino & Eyinla, 2009).

2.6. FACTORS THAT DETERMINE THE EXTENT OF OIL SPILL DAMAGE

Etkin, (1999) have reviewed the interacting factors that affect the cost of cleaning up spills in order to establish a cost estimation model or the factors that determine the extent of oil spill damage. He came up with the main technical factors influencing the extent of damage done by oil spillage, which includes: type of oil spilled, amount spilled and rate of spillage, location and pattern of oil spillage.

- **Type of Oil Spilled:** One of the factors that determine the seriousness or extent of damage done by oil spillage is the type of oil. Light crude oils and light refined products (e.g. gasoline, diesel) which do not persist on the surface of the sea or where spilled, for any significant time due to rapid evaporation of the volatile components and the ease with which they disperse and dissipate naturally. In other words the extent of damage done by this type of oil is usually minimal. Other types of oil are heavy fuel oils and heavy crudes. Theses oils are highly persistent when spilled due to their greater proportion of non-volatile components and high viscosity. Such oils have the potential, therefore, to travel great distances from the original spill location. This normally leads to extensive contamination and damages (IOSC, 2003). Generally, Light refined products may constitute a fire and explosion hazard if spilled in confined situations. Such oils also tend to be more toxic than heaver oils as they can lead to mortalities of marine plants and animals if they enter the water column. Heavy crude, emulsified crude and heavy fuel oils, generally of lower toxicity, will constitute a threat to other wildlife and seabirds (White & Molloy, 2003).
- **Amount Spilled:** The amount of oil spilled is also an important factor in determining the extent of damage done. Thus, given no variation in other factors, a 100,000 ton spill will result in far wider contamination as well as cause greater damage than say, a 10,000 ton spill (White & Molloy, 2003).

- **Location and Pattern of Oil Spillage:** As well as total spill volume, the location and pattern of oil spill can be important. The location as well as the pattern of a spill can have a considerable bearing on the extent and cost of an incident since it determines the degree of damage to the environment and economic resources. The physical characteristics of the spill site (e.g. prevailing winds, tidal range, currents, water depth, or sea bottom topography and density of the spilled oil) as well as its distance from the coast are important factors that influence oil spill dispersal as well, since

they have a considerable bearing on the feasibility of mounting a clean-up response at sea and a successful salvage operation. They will also in part determine the extent of shoreline contamination. It is also important to state that seasonal differences will also occur in the sensitivity of these resources to oil pollution and therefore the economic impact of a spill (White & Molloy, 2003).

2.7. THE ECOLOGICAL EFFECTS OF THE OIL INDUSTRY

The activities of the oil industry are not without some undesirable spin offs on the ecological environment.

Three such undesirable areas affected are mentioned by Odu (1981).

- Destruction of vegetation during exploration and lying of pipes
- The continuous presence of light, heat, noise and in some cases sooty emission from flares.
- Oil pollution of the environment through accidental blowouts, oil pipeline leaks, failure of storage tanks and effluents from refinery.

All aspects of the industry including exploration production, refining transportation and marketing contribute to a large extent, towards increasing the concentrations of pollutant in the environment. Exploration drilling is carried out to assess whether crude oil is present in commercial quantity. As an inland and offshore operation, the methods of disposing of the crude oil and associated natural gas produced at this stage contribute to environmental pollution through oil spillage. Also during commercial production of crude oil, accidental blow out while drilling has also been reported as a source of pollution in land and offshore operation. The effect of oil spills on land is varied, depending mainly upon the biota, geographical factors and the amount of spillage. Oil pollution has had deleterious effect on a number of plant species and vegetation productivity (Odu, 1981).

Nwankwo and Ifedi (1988: 58-64), identified the following factors as some of the pollution problems associated with oil exploration and production in the Niger Delta.

- **Contamination of Streams and Rivers**

  In the course of oil exploration and production in the Niger Delta, various materials are released into the environment. During exploration, drill cuttings, drill muds and fluids are used for stimulating production, and as such, the rivers and streams are vulnerable to degradation. For Example, streams and rivers may be contaminated from activities draining directly into wetlands, and also groundwater aquifer

contamination may potentially be exhibited in the water regimes of waterways, as some streams and rivers may be fed by groundwater.

- **Forest Destruction and Bio-diversity Loss**
  The major constituents of drill cuttings such as barytes and bentonite clays when dumped on the ground prevent plants growth until natural processes develop new topsoil. In water according to Nwankwo and Ifedi (1988), these materials disperse and sink, killing marine animals.
- **Effluent Discharge and Disposal**
  Refinery waste also contains very toxic chemicals, which constitutes potential land, water and air pollutants. Atmospheric contaminants from refinery operations include oxides of nitrogen, carbon and sulphur. Liquid refinery effluents usually contain oil and grease. These compounds contain organic chemicals such as phenol cyanide, sulphide-suspended solids, chromium and biological oxygen demanding organic matter, which on getting in contact with land and water pollute them.

Kinako (1981) experimented in Port Harcourt and revealed that the productivity of the ecosystem for a period of six months on polluted site was $128gm^{-2}$ as against $495gm^{-2}$ for the unpolluted site.

Generally, oil pollution has destroyed nutrients in the soils where they have occurred, hence the quality of the soil is reduced and the toxic content is increased. Also, in Ibeno LGA, large areas of the mangrove ecosystem have been destroyed. The mangrove was once a source of both fuel woods for the indigenous people and a habitat for the area's biodiversity, but is now unable to survive the oil toxicity of its habitat.

The effect of oil pollution on marine ecology is rather complex and diverse. Almost every form of aquatic life is affected on a large scale. Oil pollution has caused the death of organisms by poisoning through exposure to soluble toxic component of oil. This has brought a decline in the source of protein intake of the country.

Ever since the discovery of oil in Nigeria in the 1950s, the country has been suffering the negative environmental consequences of oil development. The growth of the country's oil industry, combined with a population explosion and a lack of environmental regulations led to substantial damage to Nigeria's environment, especially in the Niger Delta region, the center of the country's oil industry, of which Ibeno LGA is a part (Badejo and Nwilo, 2004: 2).

Oil spills pose a major threat to the environment in Nigeria. If not checked or effectively managed, they could lead to total annihilation of the ecosystem, especially in the Niger Delta where oil spills have become prevalent. Life in this region is increasingly becoming unbearable due to the ugly effects of oil spills, and many communities continue to groan under the degrading impact of spills (Oyem, 2001).

Earlier surveys in Nigeria have shown an increasing number of recorded oil spills leading to the pollution of the environment. According to the National Environmental Study Team (NEST, 1991: 440), the greatest single environmental problem connected with petroleum exploitation in Nigeria is oil spillage, both onshore and offshore. The rate of spills has been rising with the increasing tempo of petroleum production. Whereas in 1970, only one spill of 150bbl was reported in the country, a year later the number shot up to 15 incidents involving 15, 110bbl. In 1974, there were 105 spills, another 154 in 1978, 241 in 1980 and 216 in 1982. In the 13 year period a total of 1,581 spills involving nearly two million barrels of oil were reported in Nigeria (NEST, 1991: 440).

Also Ifedi and Nwankwo (1987) claim that about 2005 oil spill incidents were reported in Nigeria between 1986-1996 and the quantity of oil spilled was put at about 2,038,711 barrels with only 25,8% recovered. In order words, the highest quantity of spilled oil was recorded between 1978-1980 and of these spillages three were of major magnitude. They are the GUCON'S Escravos spill in 1978 with a loss of about 300,000 barrels, the SPDC Forcades terminal tank failure in 1978 with a loss of about 580,000 barrels and Texaco Funiwa – 5 blows out in 1980 with a loss of about 400,000 barrels of oil.

According to Nwankwo and Irechukwu (1981), the cause of oil pollution in Nigeria is as a result of sabotaging to well heads and flow lines. This act is attributed to theft, a wrong sense of revenge and maneuvers to claims of compensation.

Generally, oil spillage in Ibeno LGA, have been a regular occurrence, and the resultant environmental degradation of the surrounding environment has caused significant tension between the people living in the area and the multinational oil companies operating there.

2.8. THE IMPACT OF OIL SPILLAGE ON AGRICULTURAL PRODUCTION / ACTIVITIES

Agricultural activities which initially had been a strong contributor to the economic mainstay of the people have witnessed its ruin in the Niger Delta region. Agriculture is the dominant economic activity in the Niger Delta.

The Federal Office of Statistics (F.O.S) (1985) stated that Crop farming and fishing activities account for about 90% of all forms of activities in the area. They also estimated that about 50%-68% of the active labour force is engaged in one form of agricultural activity or the other, including farming and fishing.

The oil industry employs only 5% of the labor force (as opposed to 70% which agriculture once employed before the country became a single commodity export economy with oil production). In the past, Agriculture (farming), used to be the major occupation of the Ibeno people which includes the planting of palm oil fruits, rubber and raffia palm. Other crops found in the region include cassava, yam, plantain, banana, cocoyam, tomato, pepper, coconut and several fruit trees such as *eben* (an Ibibio name for a local pear variety), mango and avocado. The first three of these crops — cassava, yam and plantain — are the region's staple food items, grown even in the gardens of city dwellers. Locally fabricated cassava mills abound in many rural communities and in the towns providing one of the most potent avenues through which the crop shifts from its conventional category of 'food crop' to 'commercial crop'. It is in these mills, besides the home-based methods used by most rural dwellers, that large quantities of cassava tubers are processed into *gari*, which is arguably the most important food item in Southern Nigeria (Akpan, 2005: 151).

The figure below is a picture of a fresh oil palm that was grown in Ibeno LGA before the subsequent incidences of oil pollution.

Figure 2.2. Fresh Oil Palm Fruit That Was Grown in Ibeno LGA
Source: (Urhobo Historical Society FAO)

Generally, agricultural technology has remained relatively unchanged over the years and over 90% of the farmers are subsistent farmers operating on traditional methods using basic tools. Azibolomari, 1998, stated that:

"Farming technique in the Niger Delta has still remained the use of land rotation or bush fallow system characterized by land and labour being the principal inputs of production."

The organic farming technique widely used in the Ibeno area is highly susceptible to environmental changes affecting the soil, water and or deforestation because it is not technologically inspired, but rather land and labour intensive. Oil extraction and production has led to adverse environmental impact on the soil, forest and water of Ibeno community. This has ultimately affected peasant agriculture in a variety of ways. Some of the landless farmers migrate to more fertile lands in other rural communities, putting pressure on scarce fertile lands. While some of the displaced farmers out-migrate to the urban areas in search of other means of livelihood (Worgu, 2000: 4).

In this farming community, most people are engaged in crop farming, with greater emphasis upon household consumption. And their most severe problems were poor quality soils and pollution of the land even though they were somewhat distant from the oil-producing sites. Other serious problems related to their farming operations were found to be lack of inputs, insufficient capital and inadequate extension services (Hassan, *et al.,* 2002).

Various harmful and toxic organic compounds when introduced into the natural environment during oil extraction, such as during seismic work, oil spill and several other forms of pollution, changes the geo-chemical composition of the soil, river and other components of the environment. This in turn affects agriculture and leads to a drastic decline in output in both farming and fishing activities.

Stanley, 1990:67-79 noted that *"7.7% of the 797 people interviewed on the socio-economic impact of oil in Nigeria identified farm land pollution as a major problem".*

The peasants are very reactive to farm land pollution because of the unavailability of modern farming techniques to meet the challenges of declining soil resources. In other words, the drastic fall in output of the agricultural product, leads to intensive exploitation of other fertile land.

The long run effect of this, is land degradation and outmigration to other rural and urban areas, as stated above, where pressure is exerted on the often inadequate and dilapidated infrastructure, leading to increased poverty and penury and also has led to increasing urban

blight in the urban areas in the Niger Deltam, as more and more displaced rural inhabitants flood the urban areas in search of non-existent jobs.

According to Gbadegesin (1997: 9) “Apart from loss of farms, oil spills have led to extensive deforestation with no adequate replanting practices. This in effect has shortened fallow periods, compounded land use degradation and led to a loss of soil fertility and consequently erosion of the top soil”.

According to Izeogu (1986), crude petroleum is toxic to most species of flora and fauna, and when it spills and contaminates the environment, it affects the health and general living conditions of the affected communities. Such spillage could result in the destruction of farms and farmlands. The spillage has reduced soil fertility resulting in poor quality and decreased quantity of output. To farm on this type of soil is a practical impossibility, thus the dependence on fishing.

Dependence on fishing as the single most important means of livelihood appears to be as a result of soil deterioration and impoverishment via noticed and/or unnoticed oil spills in the community. In response to this, Udo and Oputa (1984) consider changes of soil properties as the usual occurrence when the soil is polluted by oil. They went further to state that “Changes in soil properties include an increase in water holding capacity, loss of soil structure, introduction of reduced conditions by exclusions of air from the soil, and production of hydrogen sulphide, among other changes”. Most of the changes adversely affected the growth of plants. Udo and Fayemi (1975) maintain that:

“Plants are destroyed or growth considerably retarded in oil polluted soils, the severity increases with the level of oil in the soil. Seeds planted in oil polluted soils generally absorb the oil and get destroyed”.

Bank Ukuejoma, a nurse from the oil spillage affected area, shared his view about the condition of pollution when he said:

“We have lost our farmlands to the oil companies while what remains under our control now behaves in a way we cannot understand. Before, when farmlands were not polluted by oil spills, a small plot of cassavas farm was enough to feed one family for the whole year. But today, it is no longer so you need to cultivate several plots to get enough” (Guardian, 1996: 18).

According to the declaration made by Okpozo Francis, he says, “We have continued to suffer huge losses in our farmlands and fish ponds because of the activities of oil spills via

prospecting companies. Oil spillage has tendered almost completely useless our economic live wire" (Newswatch, 26 December, 1988).

This factor is responsible for non-agricultural occupation among the people of Ibeno LGA and other oil producing communities as the physical condition of the soil has killed their incentive and interests in farming.

Oil production generally, has hampered agricultural activities in the oil producing community of Ibeno, farmlands gone, as well as lacking in nutrients and also in modern farming techniques, and thus has led to the growth rate of food production falling below that of the population growth by 5% (Newswatch, 26 December, 1988).

According to Eze, R.A.M., in the worst affected area of such a spillage, oil could penetrate the soil up to a depth of 0.65m, thus destroying farm crops and interfering with plant growth. For instance, some plants and fruit trees could be covered by crude oil which might affect normal photosynthesis and transpiratory processes leading to chlorophyll deficiency and quick death. Numerous field and laboratory studies have revealed that oil on landing on the leaves of plants, penetrate the leaf and interfere with its functioning chiefly by reducing transpiration and photosynthesis. Where oil pollution is light, the leaves becomes yellow and drop soon after, but under heavy contamination, complete shedding of leaves takes place.

According to Ogwanurusuo Ugberoro, an indigene of Niger Delta, lamented that:

"Since the coming of the oil men, our soil has been so much destroyed. Our crops which are the main stay of our financial reception have been killed. The most painful aspect of it all is that the pleasing harvests which we use to get from our crops are no more palm collection which use to be the main occupation of the people is gone because the palm trees no longer bear fruits as in the olden days before oil spillage". (Newswatch, 26 December, 1988).

Palm trees are not the only plants affected. Dublin – Green (1999) assess that "Oil spillage has also affected vegetables, cassava, yam, cocoyam, water yam, pineapple, banana, pepper, and okor".

The spillage had greatly impacted on food crop production and productivity in terms of quantity and quality. It has reduced soil fertility resulting in poor quality and decreased quantity of output. The people have now been pushed to the wall, thus they have resorted to the buying of food stuffs from other communities, sometimes very far from their homes. This has greatly impacted their agricultural and economic well being.

However, in the quest to identify the impact of oil spill on the oil producing communities most especially in the Niger Delta region, most studies have been done or carried out, some of which include the research which was carried out by Odjuvwuederhie, Douglason, and Adun, (2006), which is “The effect of oil spillage on crop yield and farm income in delta state, Nigeria”. The research was carried out using a sample of 262 crop farmers drawn randomly from 10 communities and 5 local government areas in the oil producing agro-ecological zones of Delta State. The researcher found out that oil spill reduced crop yield, land productivities and greatly depressed the farm income as a 10 percentage increase in oil spill reduced crop yield by 1.3 percent while farm income plummeted by 5 percent.

Another research done around this field of study is “The impact of international trade and multinational corporations on the environmental sustainable livelihoods of the rural women in Akwa Ibom State, Niger Delta region with particular focus of the study on Ibeno community in Akwa Ibom state. This study was carried out by Hassan, Olawoye and Nnadozie, (September, 2002). The study made use of both secondary and primary data. Four communities were selected by purposive sampling, in other words, the findings of the study, states that there is a marked difference in livelihood activities of the fishing and the farming communities. It was found that both men and women engaged in crop farming with greater emphasis upon household consumption. Their most severe problems were poor quality soils and pollution of the land even though they were somewhat distant from the oil-producing sites. In general, their findings have shown that the activities of the oil companies have had a negative impact upon local livelihoods, seriously threatening their sustainability.

Although, the above researches done are quite similar to the present study being done, this study will be of great importance to the people of Ibeno LGA in particular, as well as other oil producing communities most especially in the Niger Delta region of Nigeria. This is because it will seek to determine the devastating impact of oil pollution on the social, economic and cultural life of the people of Ibeno LGA and its environs. And it will also seek to ascertain the extent to which the damage done by the petroleum industry in this area of study has influenced the people culturally and socio-economically. This is unlike both of the researches stated above. The first study carried out by Odjuvwuederhie, Douglason, and Adun, (2006), is basically restricted to findings on the effect of oil spillage on crop yield and farm income in Delta-state, while this present study covers a wider range which will seek to ascertain the general impact of oil spillage on agricultural production (crop farming, fishing, animal keeping /production), as well as ascertain the general extent to which damage has been done as stated above.

2.8.1. OTHER KINDS OF OIL SPILL IMPACT ON AGRICULTURAL PRODUCTION / ACTIVITIES IN THE WORLD

- **The Chad-Cameroon (Kribi) Oil Spill Impact On Agricultural Production**

  On Monday, January 15th, 2007, at three o'clock in the morning, an oil spill occurred in Kribi, spilling an estimated 220 barrels of crude oil. This occurred as a result of a leak at the offshore terminal of the Chad-Cameroon oil pipeline, in the Atlantic Ocean off the coast of Kribi (CED: 2007)

  This oil spill which occurred in Kribi resulted in agricultural impact in the village, as Schwartz & Nodem (2009: 3) say, that as fishermen reeled in their day's catch, they couldn't help but notice the distinctly black color of all their fish, which led to the total collapse of Kribi's fishing industry.

- **The Peru (San Jose`De Saramuro) 2002 Oil Spill Impact**

  On the 3 rd of October, 2002, the petroleum company Pluspetrol experienced a crude oil spill of about 5,500 barrels, which represents 264,000 gallons. To date, this oil spill in Saramuro, Maranon River, has not been dealt with adequately. Thus beyond the environmental contamination, this spill has affected the communities socially and agriculturally. This is because the population in this community is recognized as great fishermen or "fisgas" of the Amazonia. The people in this community are dismayed because the fish have disappeared from the affected zone. This is serious in this community, given the importance of fishing in providing proteins for the affected population. Additionally, some of their farm lands have been rendered unusable by this oil spill (Resistance Oil Watch Network Bulletin, 2002).

- **Oil Spill Impact on the A'ingae or Cofan Indigenous People of Amazonian Ecuador**

  The A'ingae, or Cofan people, live between the Aguarico and Guamue`s rivers. Oil-drilling generally takes place in these communities.

  According to Flashgordon, (2008), its impact falls within three broad categories: food, culture and traditions. And also, oil operations have forced these peoples to migrate from their ancestral lands and most especially, due to the impact they suffered as a consequence of the alteration to the ecosystem. This affected their most valuable resources, namely fishing and hunting activities in these areas near the oil production

facilities. This has also resulted in the massive death of their fish and also the deaths of their domestic animals (chicken, goats, sheep, donkeys, etc). This usually happens when their animals drink from the polluted water of their streams and rivers. Another fact is that the farms and forests no longer yield good products, as this community in the past depended on hunting, fishing, picking up products in the forests and harvesting of planted farm products. In order words, all of these factors have dramatically reduced the availability of food for these ancestral indigenous peoples, forcing them to implement new ways to cultivate a land that they had not previously known. Also, these frequent oil spillages in the communities' water, rivers, marshes or swamps have affected the traditional eating habits of the indigenous people inhabiting this area. The figure below shows clearly one of the major sources of water in this community, usually polluted by oil-drilling operations and oil spillages, and thus altering the ichthyologic (fish) life of rivers.

Figure 2.3. Oil Pollution in a Major Stream in Cofan Duren
Source: (Flashgordon, 2008: 2)

- **The Impact of the Exxon Valdez Oil Spill That Occurred In Alaska, 24 March, 1989.**

The oil spill which occurred in Alaska, on the 24, of March 1989, was caused by humans, and resulted in the spilling of about 40 million litres of oil into the sea (Pandey, 2009: 1).

These oils spills lead to the death of fish and other marine animals, while other effects include the damage or destruction of beneficial properties of the animals, such as damage to the feathers of the bird, as well as the destruction of the mangrove habitat and other sources of ecological balance in the area of spill.

Figure 2.4. Oil Spill Impact on the Sea in Alaska
Source: (Pandey, 2009)

- **The August 11, 2006 Oil Spill Impact on Guimaras Island**

In the early hours of August. 11, 2006, the tanker M/T Solar 1, operated by Sunshine Maritime Development Corp, carrying a cargo of 2 million litres of bunker fuel, sank approximately 10 miles off the southern coast of Guimaras (UNDP, 2006: 1).

According to UNDP (2006:1), this oil spill was declared a national disaster by President Gloria Arroyo and it affected a total of 58 barangays on the island and the adjacent Iloilo provinces were immediately affected. A total of 7,870 families (39,004 people) were surrounded by contaminated air and water. The majority of the population located in Guimaras, relied heavily on agriculture and fishing – the

province was an agricultural and fishing community, with rice as its primary industry and coconut a close second. Guimaras is also famous for its third crop which is mango and hence, its reputation as the “Mango Capital of the Philippines”.

According to UNDP (2006: 1), the August 11, 2006 oil spill impact on the Guimaras had a great effect on their livelihood activities, as a large population of about 20,000 had no other means to make a living. Also, large numbers of fish died and the few left could not be sold as the buyers were fearful of buying contaminated fish. Their farm lands were also polluted by this oil spill, which led to the death of most of their planted crops and the lands were rendered unusable for future agricultural purposes. As a result of this great impact of oil spill in the Guimaras province, the majority of the population had to rely on other livelihood activities, some of which included: chicken production, duck eggs production, fish culture, chicken eggs production and ginger tea production. Figure 2.5, below shows a picture of a Guimaras local resident showing how oil has seeped into the ground, with a few centimeters of poking revealing that the land is more oil than soil. Figure 2.6, shows how the local residents themselves have had to clean up the sludge that had reached inland fences during low tide, thus indicating how much contamination had creeped in.

Figure 2.5. Oil Spill Impact on Guimaras Island
Source: (UNDP, 2006: 2)

Figure 2.6. Oil Spill Cleanup by the Guimaras Residents
Source: (UNDP, 2006: 2)

- **The Desaguadero Oil Spill that Occurred in Bolivia on the 1ST of February, 2000**

  According to TED Case Studies, (2000) the Desaguadero oil spill took place in Bolivia on the 1st of February, 2000 and about 29,000 barrels of refined crude oil and mixed gasoline spilled into the Desaguadero River in the Southwestern region of Bolivia. The was as a result of a flash flood that broke the Sica-Arica pipeline that goes from Bolivia to Chile, from where the oil is shipped to the United States. The Desaguadero flows out of lake Titicaca, the world's highest navigable lake at 12,500feet (3,800meters) above the sea level and it is used by the indigenous communities, one of which is the Uru Morato community or the Muratos which lived by the margins of the lake, and used the water to irrigate their crops, including potatoes, barley, beans and quinoa. Various indigenous groups also live, farm and hunt near the lakes. Since the spill, the communities who live around this lake have had their food and water sources threatened, as well as their soil degraded. Months after the spill, the Uru Moratos were forced to move by "pending starvation" from loss of their life sustaining water fowl and fishes, especially their native species of fish, "*Karachi, isipi, mauri and bogo*". Figure 2.7 below, shows a picture of oil pollution in one of the forests of an indigenous village (San Miguelito), in Bolivia.

Figure 2.7. Oil pollution in the Forest of an Indigenous Village in Bolivia Source: (Langman, 2002)

2.9. THE SOCIO- ECONOMIC IMPACT OF OIL SPILLAGE

The Ibeno local government area has been seriously affected socio-economically as a result of the activities of the oil companies located in this area. The main socio-economic impact is obviously on the local farmers and fishermen, many of which are no longer able to fish or farm. Some fishermen have had their boats and gear damaged by the oil. The impact of the spill on fish resources will also reflect on the fishermen's income. The figure below is a reflection of the traditional method of oil spill cleanup in the area of study by the community members.

Figure 2.8. Oil Spill Clean Up in Niger Delta in the Year 1999
Source: (Akpan, 2005: 251)

The contamination of Ibeno land as well as the coastal amenity areas has also led to interference and loss of recreational activities such as diving, angling, sport, fishing activities, bathing and boating. Small restaurant owners and many others who gain their livelihood from the tourist trade have also suffered temporary losses. Quite a few industries in Ibeno LGA and environs that depend or rely on sea water for their normal operation can also be adversely affected by oil spills (ITOPF, 2009: 1).

Another negative effect caused by oil spills in this community includes the loss of tourism. Ibeno has got a lot of tourist centers, pointedly, the Ibeno beach, which has suddenly been affected by this oil spill. It has led to decreased resident and non-resident vacation/pleasure visitor traffic in this spill affected area. This is due to lack of available visitor services (accommodation, charter boats, etc). Figure 2.8 below, is an example of a local stream in this area of study that was polluted as a result of oil spill.

Figure 2.9. Oil Pollution in the Local Streams
Source: (Stepping Stone Nigeria, 2009)

The Ibeno community and other oil bearing communities in this region, have struggled for survival as a result of oil prospecting activities. They have deteriorating standards of living and have lacked major social amenities, some of which include health facilities, schools, infrastructure such as paved roads, electricity and clean running water. This is because numerous oil spills have devastated the water supply and fishing ponds in this area. Also, the agricultural produce of the community (cassava, yam, raffia palms, etc.) that are the communities' mainstay have been poisoned. Without better alternatives, the people are forced to drink contaminated water and as a result of that many of the community members become ill and many, especially children, die. For this reason the oil bearing community members stage protests, demanding compensation from the oil companies located in and around their communities. In response to the protests, members of mobile police and other security agents carry out indiscriminate beatings, arrests and detentions. Sometimes it leads to death of protesters. While the management of the oil companies enjoys good living conditions, members of their host communities face a day–to–day struggle for survival (Stepping Stone Nigeria, 2009).

Other social impact includes;

- **Gross Socio-Economic Underdevelopment**

This oil producing community (Ibeno), as well as other Niger Delta communities, has remained grossly socio-economically underdeveloped and pauperized amidst the immense oil wealth owing to systematic disequilibrium in the production exchange relationship between the state, the transnational companies and the people. Enormous money had been derived from oil exports, but the area has been subjected to severe land degradation, socio-economic disorganization, increasing poverty (Figures 2.11 and 2.12 below), misery, military occupation and bloody violence (Peggy, 1999: 14).

Ikein, (1990: 164) revealed that in the oil producing region, all the social sectors investigated suffer considerable social neglect. It was a case of the oil areas yielding their natural resources to the federal government and 'suffering doubly due to the existing socio-economic disparities'. The region's 'poor conditions' he said are only exacerbated by the activities of the oil industry.

This area is undeveloped in spite of the huge amount of resources located in the area. For instance, the most dominant form of rural housing is the mud-and-thatch hut (known throughout the Delta as 'thatch house' or 'mud house'). The basic building materials for a mud-and-thatch house are puddle, wood, bamboo and thatch. The house is walled and floored with puddle, while the roof is made of a simple sequence of mats made from raffia palm fronds; these are fastened to a supporting structure of wood and bamboo. Figures 2.9 and 2.10 below show a picture of the specific housing types in the study area in spite of the huge wealth gained from their lands by the multinational oil companies located in the area.

Figure 2.10 Housing Types in the Study Area
Source: (Akpan, 2005: 176)

Figure 2.11 Housing Types in the Study Area
Source: (Akpan, 2005: 176)

Oil extraction has impacted most disastrously on the socio-physical environment of the Ibeno LGA massively threatening the fragile subsistent peasant economy and biodiversity and hence their entire social livelihood and very survival. This oil producing community has basically remained dependent and underdeveloped, persistently disempowered, socio-culturally marginalized and psychologically alienated. The wealth derived from oil resource exploitation and exports benefit directly only the operators of the oil industry and the bureaucrats in government (Owabukeruyele, 2009: 6).

- **Conflict Between Oil Companies and Host Communities**

  Of the two most appropriating external systems, that is the government and the transnational oil companies (TNC), the TNC's are in more direct and physical contact with the communities and their expropriated inhabitants. As stated above, the deprived peasants currently make demand for social services from the oil companies, rather than from the often inaccessible Nigerian State. This has often led to conflict as the oil companies are engaged in the process of collaborating with the Nigerian regime to use violence as a means of pacifying the protesting communities (Peggy, 1999: 14).

  As stated above, sources of conflict between the oil companies and the local population derives from broken promises from the companies. According to the indigenes of the community of study, recently, for example, Mobil Oil Company promised to install a gas turbine at Iwoachang village to give uninterrupted electricity supply to the whole community. Exxon-Mobil did not fulfill their promise and a serious conflict occurred.

- **Persistent Intra- and Inter-Community Conflict**

  Oil exploration and exploitation over the last four decades has also instigated and intensified bitter and bloody conflicts between emerging interest groups within and between communities. This conflicts ranges between elite groups and between youth organizations on one hand and between the urban resident elite and the village community resident on the other scale. The conflict that has emerged in the Niger Delta as a result of the extraction of oil has its roots in the violation of the rights of the local community people – the promulgation of obnoxious legislations.

Also those who are excluded from the system of mutual financial benefit, between local elites and oil company staff become increasingly resentful of their exclusion and protests involving closure of flow stations, hostage taking or even the occupation of company property. There is a clear correlation between such protests and subsequent provision of development projects, and many members of the community feel that protests are the only way to get heard. Alternatively, individuals hope that if they are able to attract enough attention they may finally be offered a contract or other sweetener.

This has eventually led to greater poverty and landless groups of people whose basic sustenance as peasant farmers has been negatively affected as a result of oil extraction for export. As a cumulative effect, this has led to more environmental problems in this area (Owabukeruyele, 2009: 7).

- **The Health Impact of Oil Spillage on the Indigenous People**

  This provides evidence of the worsening health situations of the affected populations attributed to the direct consequences of the pipeline and oil spill in this community. Some of the health problems arise from both environmental negative impacts such as pollution of water sources upon which communities depend. The pollution of river sources could expose the inhabitants to water borne related diseases such as typhoid and malaria with the creation of standing waters, diarrhoea and skin diseases. For instance, in some of the villages in Ibeno LGA, the pipeline traverses the village stream, which has served as a water source for the village. Sometimes, the destruction of the stream caused a major health crisis in the village. The oil companies were informed of the situation and their promise to redress the situation has remained unfulfilled. Also, when oil spill occurs, the community as well as the oil company workers can be exposed to it through inhalation, dermal or direct impact. The dermal and inhalational routes of exposure tend to produce exposures to different components of crude oil. In other words, people may be dermally exposed to both volatile and nonvolatile components, some of which are capable of being absorbed through the skin causing skin irritations or dermatitis. The obvious source of inhalation exposure is volatile chemicals, of which the main classes are alkanes, aromatics and sulfur compounds (Park and Holliday, 1999: 115). The health effects associated with the exposure of crude oil includes the overt signs of acute intoxication in humans – dizziness, nausea, shortness of breath, headaches, fatigue in coordination, as well as irritation of the eyes, which the people of Ibeno LGA have

complained of. It has also been found that prolonged exposure to high doses of these compounds leads to irreversible bone marrow damage causing aplastic anaemia and leukemic diseases (Park and Holliday, 1999: 120).It will be important to note that apart from the occurrence of oil spillage in the oil producing communities, other activities of the oil companies, like exploration and production processes, have also impacted negatively on the host community. "Amnesty International, 2009", drew attention to the following:

- Dredging activities: oil producing companies dredge rivers to facilitate navigation and obtain sand for construction. This activity has caused huge environmental damage to the community, e.g. coastal erosion, and also waste materials from dredging which is acidic is usually dumped on the river banks, which disrupts the environment and contaminates the water.
- Gas flaring: Subsequent gas flaring by the oil companies, has led to air pollution. This is done when oil is pumped out of the ground, the gas produced is separated and most of it is burnt as waste in massive flares and thus this affects human health.
- Seismic survey and construction of pipelines: Activities associated with oil extraction, including laying pipes, building infrastructure as well as making their operational base accessible, have caused damage to the community. Some of these activities are carried out on the farmlands with crops planted on them.
- Disposal of waste: The activities of the oil companies which are mainly exploration and production produce wastes of varying chemical compositions, which are usually generated at each phase of the operation. The disposal of this waste usually pollutes the community's farmland and water sources, thus undermining the human right to an adequate standard of living.

2.10. OIL COMPANY RELATIONS WITH THE OIL PRODUCING COMMUNITIES

Discontent among communities in the oil producing areas is being driven by a number of interlinking factors such as historical, economic, social, political and environmental. These communities are increasingly feeling disadvantaged by a deteriorating economy, lack of job prospects, limited amenities, environmental degradation and a complex political situation. This has lead to considerable unrest that came into international focus in late 1999, with the trial and execution of Ken Saro-Wiwa and eight others who were from Ogoni. However, the number of protest has grown, reaching a peak in 1993 with 169 separate incidents. The main focus is on the host communities' perception of the socio-economic responsibilities of the oil

companies to them in light of the attendant hazards arising from their activities, including loss of community and personal assets caused by environmental pollution.

According to Human Rights Watch 1999, “The oil companies have formal structures through their relations with local communities.” It shall give Petroleum Development Company’s statement of general principles, as principles that recognizes society as one of the five groups to which Shell companies owe a responsibility, that take a constructive interest in societal matters which may not be directly related to the business, and provide full relevant information about their activities to legitimately interested parties subject to any overriding considerations of business confidentiality and cost. Shell Petroleum Development Company claims that contacts with the oil producing communities are conducted through community relations committees, consisting of the chief, elders and representative of relevant groups. While Mobil Oil Company claims to have had an enviable and unrivalled policy on community relations for many years, it says it has public relations committees in all of the four communities closest to its operations (Ibeno LGA, Eket, Esit, Eket, and Onna in Akwa Ibom State).

According to Human Rights Watch, 1999, Mobil’s committee members are elected by their respective communities. They are saddled with the responsibilities of sampling opinions from their communities to determine what projects they want Mobil to carry out. The projects are prioritized and discussed with Mobil External Affairs Staff and are executed based on the community relations budgets. Surprisingly, according to Human Rights Watch, 1999: “Residents of the areas which Mobil operates, however, criticize the public relations committees for being contract conducts, and distortion-and-bribe-stricken organizations”. Despite the stated policies of some of the oil companies, the oil companies and their contractors are typically perceived as arrogant and dismissive by local communities. Those who negotiate with the communities are frequently described as unsympathetic or hostile and in allegiance with local chiefs and contractors.

Those traditional leaders and contractors who benefit from the presence of the oil companies have every interest in their operations, even if the majority of the people do not. Nevertheless, it’s so clear that a large number of the inhabitants of the oil producing communities regard the oil industry with hostility, regarding it as destructive and exploitative, and deeply resenting the wealth of those in the industry or with contact to it, compared to the poverty of those who live close by.

Oil company workers in Ibeno LGA, typically live on barges in virtual isolation from local communities, obtaining their food, water, and other supplies from company suppliers rather than local retailers. The road to their oil facilities is tarred while the road into the village remains a dirt tract. Also, if the oil workers fall sick, they are airlifted to a company hospital in Port Harcourt or Lagos, while the local people have little or no health care facilities available to them other than some ill-equipped medical centres and their traditional remedies.

The presence of oil has also exacerbated political disputes in the oil producing communities over territory or other rights. While territorial disputes in the oil bearing region predate the discovery of oil, and continue in other parts of the Nigerian federation, it is undoubtedly the case that many of the conflicts between neighbouring communities in the Delta are fuelled by the presence of oil. Even though the companies are blamed for a range of ills and for not doing enough for the areas where it operates, communities are also aware of the potential benefit of having a pipeline travel through their land or a flow station, and the opportunities for compensation payment and contracts that will result even if the cash input only reaches a few. Hence, disputes between communities which have been latent can be stirred up by the suggestion that an oil installation is planned, as well as by damage caused by oil pollution.

According to Human Rights Watch (1999): ”Local community members regularly assert that the oil companies use the award of contracts or development projects in a deliberate effort to divide the communities among and within themselves and thus rule them without serious challenge to their operations’’. Whatever the intensions of the companies, division and conflict within and between communities can often result from or be exacerbated by their presence.

2.11. OIL ROYALTIES AND SOCIAL DEVELOPMENT

Royalty is defined as payment made by a mining or oil company to the owner of the land being mined (Oxford Dictionary).

2.11.1. PROBLEMS WITH OIL ROYALTIES

Royalties accruing from crude oil is associated with numerous or diverse problems, most of which are onshore–offshore oil dichotomy, derivation formula, revenue formula, et cetera. These points will be explained below.

- **ONSHORE–OFFSHORE OIL DICHOTOMY**

  From independent to 1992, when onshore–offshore oil dichotomy was abrogated, oil produce on land attracted royalties, while oil produce from riverbeds was termed

offshore. Nations' natural endowment thus attracted no royalty either from oil companies or the federal government who claimed ownership of this area under the Land Use Act of 1978.

As a result of this, Shell (1996), states that "rents on land acquired for oil operations are payable to the governments, while communities are compensated by oil companies for the loss of their right to use the land". Often, the dissatisfaction felt by the communities, exacerbated by the fact that oil royalties go to the federal government, is taken out on the oil companies.

In Nigeria, out of the every hundred percent of oil extracted, offshore accounts for 70% and Akwa Ibom produces about 60% amounting to 3 billion barrels per day. Yet they were not benefiting from it because of the onshore–offshore oil dichotomy which was affected when the prospecting licenses were converted to oil mining licenses in 1968. In 1992, the General Ibrahim Babaginda administration abrogated the onshore–offshore oil dichotomy decree of 1968, whereby granting Akwa Ibom State the right to enjoy oil royalties from the Federal Government, as well as the mining company – Mobil Nigeria Unlimited.

Under the democratic setting of the fourth republic, the onshore–offshore oil dichotomy was re-effected by President Olusegun Obasanjo. In 2002, a bill was constitutionally passed by the joint sitting of the two arms of the National Assembly's abrogating the onshore–offshore dichotomy and on February 2004, president Obasanjo assented to the bill which partially put to rest the obnoxious offshore–onshore dichotomy in Nigeria (partially, because the president used the word "200 metres Isobaths and that every state is entitled to enjoy the principles of derivation as far as 200m Isobaths") – Daily Sun (Monday April 5, 2004).

According to Prof. Itse Sagay (Daily Sun April 5, 2004), "It is not yet "Uhuru" for his people over their struggle for a better share of the oil revenue being realized from their area". He further described the removal of onshore–offshore oil dichotomy clause from the Niger Delta development bill as "a deceit and a fraud designed to keep his people perpetually in squalor". He also explained that onshore and offshore oil dichotomy has not been abolished because more than 100 miles offshore is still not coming under derivation principles.

Akwa Ibom in the past, from the discovery of oil till 1992, has not received any royalties from either the oil companies or the federal government, but they suffer the same environmental, agricultural, socio-economic and other problems faced by other oil producing communities who are receiving them.

In the case of oil spillage, the Ibeno Local Government Area suffers a lot, as government and oil companies in terms of relief have been found to be irrational and unscientific in response as they give priority to areas that have oil locations on land rather than those that have it offshore. The latter contain a greater number of victims whose recovery level is comparatively low because of their monolithically-oriented occupation. At times, they find it extremely difficult, and even sometimes impossible to rehabilitate themselves without substantial relief.

- **OIL DERIVATION FORMULA**

  The federal government economic policy provides for compensation to oil producing areas by providing the oil derivation formula, whereby oil producing states and local government derive revenue from oil according to the location and percentage of oil produced in their area. What this entails is that the formula of oil derivation is not in keeping with the rate of environmental degradation.

  Initially, 4% of the oil derivation was allocated to the oil producing communities in the country, but recently, after much bargaining power and resistance from oil producing communities, an increment of about 13% of oil derivation was given to the oil producing communities. But this has not resolved the conflict in these regions, especially the vandalization of oil pipelines by the local indigenes, as they want to be in control of the entire oil resources or revenue generated from their area.

2.12. LEGAL / INSTITUTIONAL FRAMEWORK FOR PETROLEUM OPERATIONS IN NIGERIA.

The Nigerian petroleum industry is governed by plethora laws or legislation, just as is the case with other oil-producing countries. The most important oil –related legislations in Nigeria include: The Petroleum Act, 1969, Land Use Act, 1978, Oil Pipeline Act, 1956, Federal Environmental Protection Agency Act, 1988, Oil and Navigable Water Act, 1968, Petroleum Control Act, 1967, Offshore Oil Revenue Act, 1971, Exclusive Economic Zone Act, 1978 and

the National Inland Waterways Decree of 1997. For the purpose of this study, little pieces of the legal framework will be analysed.

- **The Petroleum Act of 1969:** The petroleum Act defines the issues of petroleum resources ownership and control. It is regarded as the most important oil–related legislation in Nigeria. In order words, by the Petroleum Act (originally Decree 51), the entire property in petroleum (mineral oils) is vested in the state. This means that the Federal government has absolute right and control over oil resources (all minerals, mineral oils and natural gas), in the country at large.
  Thus the Petroleum Act requires a license to be obtained from the ministry of Petroleum Resources before any operation (exploration, drilling, production, storage refining or transportation) is carried out by the oil companies. Therefore the general supervisory power over the activities of the oil companies is vested in the Minister of Petroleum Resources and he also has the authority or power to revoke a license under certain conditions.

  Generally, the Petroleum Act set the stage for the participation of Nigerian oil companies, oil producing communities and all Nigerian citizens in the oil enterprise and gave the state the legal basis to promote operating, policy and fiscal environments that would best serve the development needs of the Nigerian society (Akpan, 2005).

- **Land Use Act 1978:** The Land Use Act ("LUA") was promulgated in 1978 for the purpose of vesting all land within the territory of country in the Government of Nigeria, with the intention that such land is to be held by the Government in trust for the people of Nigeria and allocated or administered for the use and common benefit of all Nigerians in accordance with the provisions of the Land Use Act.

  Therefore, the president of Nigeria is responsible for all the land located in or within the Federal part of the country (Nigeria), while the governor of the state is responsible for all urban land comprised within the territory of each state in the country and other lands in each state (not being federal or urban land) is held in trust by the chairman or the relevant local government area (Amaechi, 2004).

  Before the promulgation of the Land Use Act, it is important to note that oil companies that had obtained mining rights from the federal government approached oil bearing /

land owning communities for the right of access to the land for its operations. The various oil–rich communities believed it was a way by which the communities would have some sense of participation in oil operations as they received some compensation for granting access to their land as well as for any damage to land and any surface rights thereon. Therefore, the entire oil–bearing community, have blamed the government and its laws, especially the Petroleum Act of 1969 and the Land Use Act of 1978 for their poverty and terrible conditions. The oil–bearing communities believe this is because of the right of the state as the sole ownership and control of the country's oil and gas reserves, invariably making the government the owner of all land in Nigeria. The entire oil–bearing community feel that their sense of participation and belonging has been lost since the establishing of the Unity of Land Rights With Oil Rights in 1978 (Ebeku, 2000).

According to Prince Wegwu, who heads a youth association in Alun, a village in the Niger Delta and owns land in this area with 31 oil wells on it: *"Oil companies pump out thousands of barrels of oil a day and yet, neither I nor my family have benefited".* The oil companies say: *"We pay the government for the use of the land"* (World Prout Assembly, 2007).

The Land Use Act of 1978 has also been blamed for the massive decrease in Nigeria's agricultural production in the decades subsequent to its enactment. Local farmers in the oil producing communities are not being compensated for their oil-polluted farm land, and also the laws do not make provisions for the fishing communities in the oil–bearing areas, for compensations for their polluted streams, rivers and sea, on which they depend as their source of livelihood. Also, the government and the oil companies have refused to recognise the value locals place on communal land. Thus claims of losses from communally–owned shrines or sacred forest on which people rely for medicine, or wild cane for goods such as raffia furniture, have been rejected. And so, the fishing and farming communities have no visible evidence on which to base their claims.

According to Patterson Ogon, the founding director of the Niger Delta based Ijaw Council for Human Rights: *"Before 1978, oil companies had troubles negotiating with the occupants of the land to access the oil, but after the Land Use Act was implemented occupants could wake up one morning to find oil companies already*

*drilling on their property and there was nothing they could do about it" (*World Prout Assembly, 2007).

Oil–bearing communities would therefore prefer the land rights to be given back to the locals or that the maximum benefits or compensation should be given in place of their acquired lands.

- **Environmental Impact Assessment Act (Decree No. 86 of 1992):** The Environmental Impact Assessment Act (EIA) of 1992 requires the environmental impact assessment (EIA) to be carried out where the extent, nature or location of a proposed project or activity is, such that it is likely to significantly affect the environment. The public and private sector are enjoined to give prior consideration to the environmental effects of any activity before it is embarked upon. Therefore the carrying out of EIA is policed by the federal environmental protection agency and also by the state environmental protection agencies (Bronwen, 1999).

- **Mineral Oils Act of 1963:** The mineral oil safety regulations of 1963 were promulgated under the Mineral Oils Act and it states that full oil field practice shall be considered to be adequately covered by the appropriate current institution of petroleum safety codes, the American petroleum institute codes, thus effectively binding oil companies to respect international standards in their operations in Nigeria. Under this Act, the oil companies are obliged to adopt all practical precautions including provision of up-to-date equipment, to prevent pollution and must take prompt steps to control and if possible, end it, if pollution does occur. They must maintain all installations in good repair and condition in order to prevent the escape or avoidable waste of petroleum and to cause as little damage as possible to the surface of the relevant area, including the trees, crops, buildings, structures and other properties thereon. Oil companies are also required to comply with all local planning laws (Bronwen, 1999).

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1. INTRODUCTION

This research is a survey study design, mainly to collect data that would assist the researcher to investigate and assess the impact of oil spillage on agricultural production: a case study of Ibeno Local Government Area of Akwa Ibom State Nigeria. To achieve this aim, certain research procedures have been adopted. The research methodology has therefore been dedicated to the presentation of such procedures.

3.2. STUDY HYPOTHESIS

Since the Ibeno Local Government Area is exposed to the impacts of oil spillage by the oil producing companies, this study hypothesised that some investigations be carried out to determine its impact on Agricultural Productions. Another hypothesis of the study was that a multi-sect oral approach to disaster management should be implemented in the area, which basically involves preventing the risk of disaster, mitigating the severity of the disaster as well as effective responses to the disaster. These will help to reduce the impact of oil spillage to the oil producing communities.

3.3. RESEARCH DESIGN

Research design is defined as the plan, structure and strategy to investigation conceived, so as to obtain answers to research questions or to control variance (Kerlinger, 1970).

There are several research designs that could be utilized in research investigations. These entails survey, historical, case studies and observational and participatory research designs (Hlatshwayo, 2007: 4).

The descriptive survey design and the case study type of design were employed in the conduct of this research. The descriptive survey design was chosen because it helps to describe record, analyze and interpret the conclusions that exist in the study.

The case study type of design was also appropriate for the study that was undertaken, as it allows the researcher to concentrate on a specific instance or situation and to identify, or attempt to identify, the various interactive processes at work (Bell, 1987: 6). The nature of this study which is predicated on the impact of oil spillage on agricultural production: A case

study of Ibeno local government area of Akwa Ibom State in Nigeria, detects the choice of the research methodology.

The research study was a combination of both qualitative and quantitative research methods. Qualitative information that was utilized in the course of this research, involves an interview and retrospective case studies. This was useful in the sense that the method allowed the researcher to view behavior in a natural setting without the artificiality that sometimes surrounds experimental or survey research (Wimmer, 1999). This technique also helped to increase the researcher's depth of understanding of the phenomenon under investigation. The quantitative research technique using questionnaire was also adopted because the use of numbers allows greater precision in reporting results (Gerbner, Gross, Morgan and Signorielli, 1980).

3.4. POPULATION OF STUDY

With regards to the present study, the population for the study comprised of a total of one hundred and fifty (150) respondents, both male and female members of the community and no exclusion or inclusion criteria was employed as long as the individual resided in the community of study.

3.5. SAMPLING PROCEDURES

The importance of sampling in its renowned function of statistical proportion of a given population that represents the whole cannot be over emphasized. The study area is so large that sampling becomes the most potent approach to arrive at a conclusion under the circumstance. Simple Random sampling was the method used in selecting the sample from the population. The simple random approach was utilized to select the adult male and femal members of the community, majorly from the selected villages in Ibeno LGA (Upenekang, Mkpanak, Iwoachang and Inua Eyet Ikot), chosen for the studies.

This helps to eliminate bias and as much as possible reflect on the true situation within the community, rather than confine oneself to a selected idea of a selected few.

3.6. DESCRIPTION OF SAMPLE

The sample target consisted of 150 respondents, targeting in retrospect 81 male and 69 females, aged between 16 and 60 years, applying demographic information like age, sex, marital status, educational qualifications, occupation, household size, annual farm income and farm-size (ha). The respondents included indigenes and non-indigenes of Ibeno who are resident or have domiciled there for a long period of time.

3.7. DATA COLLECTION TECHNIQUES AND INSTRUMENTATION

In carrying out this study, the researcher relied heavily on a structured questionnaire which is an appropriate instrument for data collection. This was used because they could be utilized as face-to-face techniques as level of literacy is low. This questionnaire was structured in simple and clear terms with both direct and logical questions to meet the standard of all classes of people interviewed.

The structured questionnaire was guided by the hypothesis formulated for the study and it contained two sections, A and B respectively. Section A was on personal data. The information elicited bordered on sex, age, marital status, occupation, educational level, occupation, household size, farm size and annual farm income. Section B contained 20 items which was meant to elicit information from the respondents on the impact of oil spillage on agricultural production and its subsequent socio-economic impact on the well being of Ibeno people.

The respondents were required to tick (√) the column that best corresponded with their line of thought. A four-response pattern was adopted:

Strongly Agree

Agree

Disagree

Strongly Disagree

3.7.1. INTERVIEW

Personal interviews were also employed for finding the information required by the researcher. The techniques of the interview were semi-structured with the aim of extracting detailed as well as important information from the subjects of the study in connection with the environment they utilize for agricultural practices. The main reason for using this technique is that “An interviewer can collect supplementary information about respondents. This may include background information about personal characteristics and their environment that can aid the researcher in the interpretation of the data” (Nachmias and Nachmias, 1992: 228).

A research assistant was employed, for language translation and use of tape recorder to aid communication as some respondents might be deficient in English which is the main language the researcher used.

3.7.2. OBSERVATION

Observation was useful in the collection of data for this research study in connection with the areas of farmland and locations of rivers and streams that had been affected as a result of oil spillage in the community, as well as their coping resources. The use of observation in the course of this research was also very useful, as it was used to compliment other data collection instruments (personal interview, FGDs & Questionnaire). It also helped to identify important variables and provide useful preliminary information, as well as the fact that it assisted the researcher to provide access to groups that would otherwise be difficult to examine. Perhaps the most noteworthy advantage of this technique, is that the study takes place in the natural setting of the activity being observed and thus can provide data rich in detail and subtlety (Wimmer and Dominick, 2008: 120-121).

3.7.3. DOCUMENTATION

Documentation was also used in acquiring detailed information for the description and explanation of the research study. The documents comprised of the use of internet information script, magazine articles, as well as various newspapers and other important documentation. All these sources were very useful to the researcher, as the information gathered was utilized and helped the researcher to gain as much understanding of the research problem as possible, as well as to make an appropriate interpretation of the research findings (Hlatshwayo, 2007).

3.8. DATA COLLECTION PROCEDURE

The researcher visited the four villages chosen for the process. Therefore in order to ensure that successful work could be carried out in the area, permission to carry out her study in the various chosen villages by the authorities in charge (for example the village heads and chief) were sought and well documented. She started by introducing herself and the purpose of the study to the correspondence, as well as assuring them that the information they would give out, would be kept confidential. A standardized question format was utilized in interviewing each subject and thereafter the filled questionnaires was collected and comments noted were written at the spaces provided in the questionnaire.

3.9. DATA ANALYSIS PROCEDURE

Responses collected from the items on the questionnaire formed the basis for data coding. The data collected was subjected to a largely descriptive analysis, using a simple statistical analysis, of each characteristic found in the material, as well as using a pie chat and graphs for analysis.

Also, the qualitative data, which was collected from the personal interview, was transcribed and translated into subsections and utilized inductive reasoning as well as content analysis to ascertain the extent of impact. The information or data obtained from the observational procedure was also used to complement that which was obtained from both quantitative and qualitative data.

CHAPTER 4

DATA PRESENTATION AND ANALYSIS

4.1. INTRODUCTION

During the course of this research, some procedures were used in the gathering of data by the researcher in the study area. Below is a brief statistical analysis and result interpretation of the data collected from the study area. In this chapter, the analysis of data collected through the instruments used for the study is presented.

4.2. FOCUS GROUP DISCUSSION (FGD)

Focus Groups (FG) were used in data collection for this study. The FGDs were used to compliment the questionnaire used in the data collection. This is mainly because FGDs enable the group process to generate a wider range of information and it enhances the respondents' views. The focus group interview and facilitation also encourages the respondents to be more candid in their responses, resulting in less individual pressure as well as spontaneous responses, especially when people have a definite point of view.

This supported the views of Burns (1989), Albre-Cht *et al.* (1993), Holstein and Gubrium (1995) and Greenbaum, (2003), who all suggested that group dynamics provide valuable breadth by multi-vocality.

The FGD was mainly carried out with a well-known and already formed group within Ibeno LGA of Akwa Ibom State. The focus group is a branch of a bigger group called the Movement for Emancipation of Niger Deltas (MENDS), Ibeno branch, made up of 12 participants from each individual village, as mentioned previously. This group was selected with strong recommendations by the Ibeno people based on their records, strong contributions and the enormous impact with conflict resolution and peace brokers between the oil communities and the government. The purposive sampling technique was also used in order to choose other focus groups existing in the community, such as the Association of Niger Delta Women, Ibeno branch.

The participants in the FGD were actually happy about the discussion that was carried out. They said they needed someone to express their heavy heart to, as well as the fact that they needed someone or even an organization that could help them inform the entire public, and the world at large, of the deteriorating conditions in which they live (such as poverty and suffering, which has recently led to death of various members of the community). They also

wanted someone to talk to their village leaders/chief in order to try and change their oppressive behavior into a peaceful and cordial relationship within the entire community – mostly between the youths, chiefs and the oil company officials.

During the FGD, the researcher introduced herself and informed the focus group of her aim or reasons for assembling them, which was to determine their general knowledge about oil-related issues in their community, as well as let them know the research topic concerning the impact of oil spill on agricultural production in Ibeno LGA.

The researcher also moderated the group in order to save time, enable all members of the focus group to be able to participate in the general discussion and avoid it being dominated by a single individual or a few out spoken ones. Arguments could also, as such, be avoided, as the focus group was dominated by youths with different backgrounds from the villages in the Ibeno community.

The researcher posed some questions to the participants vital for the research study. The major questions asked where; firstly, what was the major hazard in their community, secondly, its impact on agricultural production, and thirdly, is the compensation gotten by the community equal to the impact of the specific hazard mentioned? Some responses were given by the group.

The group findings indicated that since the coming of the oil companies in their community, the entire community has suffered grievously. There was a quick agreement amongst the group that oil spillage was considered to be the major hazard in the community, amongst others (erosion, flooding, excessive heat, gas flaring and drought), and that it has impacted negatively on the members of the community.

Other responses received from the focus group were the issues of marginalization and severe neglect of the inhabitants, the environment and especially the massive destruction of agricultural land as a result of oil spillage from the oil companies. Oil pipeline vandalization by the community members during conflict with the federal government also came up. The exploitation of their community by the government and the oil companies has left them with emotional, psychological and structural defects, as there are no good roads, poorly equipped facilities, like hospital or clinics (leading to deteriorating health conditions) and no pipe-borne water, as their major sources of water (river, wells and streams) have been exposed and contaminated by various oil spills. The people describe their water as containing crude oil.

During the focus group interactive discussion, it was also revealed that other purported effects of the presence of these companies are the loss of biodiversity, deforestation (due to fuel wood extraction) and increased decadence and decline in traditional values, especially as a result of the influx of strangers and commercial sex workers, whom are usually patronized by the oil company staff. The sudden high rate of theft in the community was additionally discussed as a result of joblessness amongst the youth and the able bodied-men in the community.

Most importantly discussed and lamented with aggravated anger by the group was the issue of oil spillage, which has seriously affected their livelihood activities (agriculture), which they have depended on for years. According to them, the quality of forest, land, soil and even water in the community is poor. The evidence of poor land and soil in the community is that most of the fruit trees in the area hardly bear fruit anymore and when they do, the produce is poor. Oil spill impact on the fishing activities in the community has also been identified. Some of the discussants stated that they used to get a large catch of fish from the high seas, but now they can spend up to four days at sea and come back with a dismal catch. Also, respondents uncovered that whenever there was oil spill and it was not cleaned up, their fishing nets would get stained, making them unusable. Generally, the respondents' summarized the impact of oil spill on their livelihood activities as enormous and also as a result of low agricultural yield, land productivity and farm income, the quality or standard of living has degenerated further.

Finally, the focus group interactive discussion has uncovered that the intensified bitter and bloody conflicts in this area (which range between the youth and the community elders on one hand and between the youth and the oil companies on the other) was as a result of lack of transparency and openness in the way the community elders or chiefs related with the oil companies and the government. In discussing this issue with the focus group there were mixed responses. Some of the discussants stated that the 'elders' were not transparent with their dealings with the oil company, as they do not offer to the community all the oil royalties/benefits that had been offered to them by the oil companies, and sometimes they do not bargain properly for sufficient and adequate social and structural services and benefits. In other words, the youth accused the oil companies of bribing the elders to stand against them in their pursuit for community reparation. Few others stated that their relationship with the 'elders' were slightly cordial.

According to the discussants, another root of the bitter conflict between them and the oil companies stems from the false and constant broken promises from the oil companies.

Finally, the principal researcher made a summary with the discussants, about what they would have liked to see in their community. These are the recommended or proposed options:

- Government provision of an alternative source of livelihood for them, as that which they had depended on, has been destroyed.
- Improved social amenities, which will help improve their standard of living, like well-equipped and accessible schools (to improve the literacy level, as the current illiteracy rate has indirectly led to oil vandalization), hospitals, pipe-born water and generally good housing conditions.
- Total control of oil derivation in their community.

4.3. OBSERVATION

Observation was useful during the course of this study in the sense that it helped to identify some important variables and provided useful preliminary information. This could be supported according to Wimmer and Dominick (2008: 120-121), where it was stated that the most noteworthy advantage of this technique, is that the study takes place in the natural setting of the activity being observed and thus can provide data rich in detail and subtlety.

During the observation in the community of study, it was noted that Ibeno community consisted of twenty-three clans and that Ibeno is divided into two sub-areas by the Qua Ibeo River, the area across the river being made up of six (6) villages, headed by different village heads. The observation was carried out generally in the community of study but, most especially in the four chosen villages (Upenekang, Mkpanak, Iwoachang and Inua Eyet Ikot), which were randomly chosen for the study as earlier stated. This was basically due to some limitations of the study. From the researcher's subjective observation, it was obvious that the entire community has been psychologically alienated and socio-economically affected by the activities of the oil companies located there. This community has remained socio-economically underdeveloped. Large areas of land have been destroyed (loss of soil fertility) and deforestation was another visible major problem in this community. Deforestation (forest destruction and bio-diversity loss) is mainly as a result of the activities of the oil company (drilling) located there. Most of the streams and rivers in the community of study have been abandoned by the community as a result of a high rate of contamination by various oil spills which have occurred in the past in the community, thereby making the streams and rivers unusable for the community and as such affecting their sources of livelihood, which was predominantly crop farming and fishing.

Around the streams and major rivers, it was observed that some of the water sources looked turbid and dead. This pollution has forced the people in the community to travel long distances by canoe to neighboring villages to buy water for drinking and cooking. The researcher asked for other sources of water in the community apart from streams and rivers and she was taken to the village well. It was also observed that there were only two water wells in the village, but the water from them was rusty due to high iron content. Many people opt to fetch water for people in return for payment. They carry 20 litres of jerrycan or buckets and fetch clean drinking water from the neighboring village. For this they are been paid between N80.00 and N100.00 per 20 liters of water fetched.

It was also observed that one of the coping mechanisms employed by the local population (due to the massive destruction of farm lands by successive oil spillage) is that they engage in multiple income-generating activities. Therefore, this has resulted in nearly all men, as well as women in the community, engaging in various income generating activities, which are mostly seasonal, like small scale trading or petty trading in front of their houses, processing and selling of snacks or cooked food, shoe makers, scooter taxi operators, livestock keeping (poultry, etc.), crafts, etc.

Observed also was the fact that the younger women parade themselves in the evening in and around the premises of the oil companies located there, as commercial sex workers. This has thus led to increased social vices in the community. The issue of increased social vices was also noted and confirmed by one of the respondents, who would like to remain anonymous, during the administration of the personal interview. He stated that the young ladies who carry out these activities are mostly from poverty-stricken families. He has also lamented that STDs and HIV/AIDS are very common in the community.

During the observation process, the researcher saw a few farmers returning from their farms carrying their meager produce on their heads. It was supposed to be the yam and cassava harvesting period in the area and it was thus observed that the yams and cassava harvested and carried by the farmers were of relatively small sizes. It was thus deduced by the researcher that this community has a generally low agricultural yield. Other serious problems observed relating to their farming operation were lack of input and inadequate extension services – the result of pollution of the land/soil. This renders large hectares of land unsuitable for agricultural practices and consequently most lands have been abandoned by the people.

The housing conditions in Ibeno LGA are very poor. The majority of the houses in this community are mud–and–thatched hut, which are commonly called 'mud houses'. These houses are made up of thatch, bamboo, wood and puddle, while the roof is made up of mats from raffia palm fronds. With pipelines crossing in front of the houses, in other words, not properly dug, these houses are vulnerable to fire outbreak in the case of oil spill. This is a fact that was supported by some respondents during the personal interview section, where it was said that during the 1998 oil spill in Ibeno, some of the houses that were close to the site of the incident were actually burnt down and there were a lot of mortalities and morbidities.

Finally, it was observed that there were a lot of youth associations and few women associations in the community. The youth associations are comprised mostly of men aged between 18 and 40. The youths acknowledged that their functions included working towards the development of the community, contrary to what the media portray them to be –which involved the kidnapping of oil workers, especially the expatriates (foreign oil workers).

4.4. INTERVIEW

Personal interviews were conducted in Ibeno LGA. These was carried out in order to probe and gather data on the individuals' knowledge of the impact of oil spill in their community with special reference to the impact of oil spill on agricultural production. This interview section was conducted by the researcher with 12 representatives from the community. The interviewees consisted of 4 women, including an elderly woman aged 71, and 8 men respectively. These interviewees were chosen using random sampling. This was done by interviewing the oldest individual found in every third home in the community of study. The interviews took place in their respective houses. A research assistant was used during the course of the study, who was originally from Oron village and an environmental management graduate from the University of Calabar, Cross River State. During the interview session, the research assistant handled the bulk of the note taking and tape recording, with permission of the interviewees, as well as translating in both languages (Efik and English) as the researcher did not understand their local language. Some of the respondents also could not understand or speak English and so he also helped to amplify specific issues that were raised with the respondents, which further enhanced the quality of the primary data. Most of the important responses will be mentioned for the purpose of this research.

During the process of the interview, some relevant questions and topics were raised. The interview guide or the nature of the questions included:

- Their general knowledge on the impact of oil spillage in their community.

- The extent to which oil spillage affects agricultural production in Ibeno LGA.
- The acres of land the individuals possessed and how they had been affected by the activities of the oil company.
- Level of involvement of the interviewees in agricultural activities in the study area.
- The compensation each individual has received in the past from the oil company.
- To what extent the socio-economic activities are affected by oil spillage.
- Apart from agriculture, the other economic activities that take place in the village.
- How they view the role and responsibility of the elders/youths in oil related issues.
- How the oil spill has affected their income.
- How oil spillage has affected the community psychologically.
- Had the government policies helped the people of Ibeno LGA.

A lot of information was uncovered during the process of the interview. The entire group interviewed had a general belief that the oil company had caused them more harm than good, since their operation had begun in the seventies. They all confirmed that the various oil spill incidences that have occurred in their community have virtually denied the entire community of their means of livelihood, which is basically crop farming and fishing. Crop farming has been affected because oil spillage has been a re-occurring incident in the community and that it has degraded their lands and polluted the streams and rivers, in turn rendering the land and soil unusable for agriculture. The majority of the respondents admitted to having been involved in one form of agricultural practice or the other. It was uncovered by the oldest respondent, an elderly woman of 71, Mrs. Etim from Mkpanak village, that in the past most farmers spent an average of about 5 to 6 hours on their farms and that they enjoyed the farming activities (land clearing, planting or cultivation and harvesting which was the most interesting aspect of farming activity). However, since the coming of the oil company to their community, and the subsequent oil spillage, the few that still depend on agriculture now spend between 9 to 10 hours per week on their farms. The extent of the damage done to their land has now made them work extra hard for any kind of results and the further distance to their new farms was another factor resulting from the acquisition of new, unaffected land for cultivation. It was also revealed that oil spill has negatively affected their production level, leading to poor harvest, colour change in plant leaves, premature aborting of plants and fruits and the generally declining growth of plants. As such, it has lead to household food insecurity and low farm income. Most of the community's farmlands have been taken over by force by the oil companies and either used

as exploration sites or to construct their oil wells, which are then eventually abandoned by the companies at development stage or appraisal stage.

Amongst those interviewed, 2 people, namely Mr Ineobong Bassey and Mr Philip Okon, basically both middle-aged, were of the opinion that although the oil companies may have degraded their ecosystem, they have also done a lot for them, like providing constant electricity in villages around the Mobil operational base and some incentives have been received from them. On the contrary, the youths that were interviewed all denied that anything had been given to them and that oil exploitation and environmental degradation that accompanied it, was largely responsible for their impoverishment, thus denying them of their source of livelihood. In other words, the 'elders regard the youths as being disobedient while the youth regards the elders as being greedy and selfish'. They also revealed that the fact that they do not have access to alternative vocations in the community, which has aggravated the incidence and severity of poverty in the area.

Twelve (12), of the respondents, were of the opinion that oil spill has negatively affected the health of the people, including psychological, behavioral and the personal well-being of the community. They complained that the atmospheric air in this area is always tense and charged with the suffocating smell of hydrocarbons, particularly after an oil spill incidence. This primarily has lead to a large number of deaths of asthmatic patients and others affected by serious respiratory ailments, which is instigated by poor and inadequate nutrition of the people.

Some other health cases reported by a greater number of the interviewees, included heart attacks, coughs, increased diarrhoea, malnutrition, skin diseases (dermatitis), as a result of bathing in oil polluted water and cancer, which they couldn't really identify the type of.

According to interviewee, Mr John Udeme from the Iwoachang village, "When the above listed diseases affect to the indigenes, it usually results in death, as the community do not have access to well-equipped hospitals, as well as money to travel to a well-equipped clinic. Most of them then rely on their traditional remedies which sometimes do not help their deteriorating conditions".

These respondents all argued that amongst the various causes of oil spillage in their community, vandalization was identified as the major cause, which they agreed was carried out by the youths in the community.

The few of the youths that was among those interviewed, who would like to remain anonymous, did not deny their participation in the vadalization of pipelines. They gave their reasons as an act to express their grievances and also to retaliate for the extent of degradation and total destruction of their environment by the oil companies. According to one of them, “This act will never stop until the government listens to us and grants us our request of 50% oil derivation, or even to be in total control over our resources, instead of the current 13% derivation given to us which hardly gets to us. Also, the oil companies should use a quota system in employing the indigenes, giving contracts to them and developing our community”.

Mrs. Udeme Edet, a teacher in one of the secondary schools, who was one of the females interviewed, had stated that the oil spill that occurs in their community, in many cases has resulted in fire outbreaks, which lead to loss of lives, burning of farmlands which have crops planted on them, as well as loss of property, as in the case of the 1998 oil spillage in the community. This was very fatal, because pipelines where laid in close proximity to human habitation.

Also mentioned by this respondent was the issue of high rate of illiteracy in the community as a result of low standard of education offered to the people. The few primary and secondary schools located in this community, which most of the children attend, lack a lot of important amenities. Most of the learners are being taught under shady trees, as there are no classrooms (as observed by the researcher during her visit to some of the schools in the community). Neither are bursaries or scholarships offered to the children in order to encourage them to study and to go to good private schools in other town. There is also no transportation (school busses), for students who live very far from their local school and so some students usually trek or walk, while others use their canoes to go school, which is quite a distance from their homes. This leads to high rate of late coming to school. Often by the time they get to school they have already missed the first two lectures of the day. All of these difficulties in studying drive a lot of the pupils to farming practices, as they cannot measure up academically. Sadly, even agricultural practices are no longer favourable for the people, resulting in joblessness. Some of them join youth associations and get involved in pipeline vadalization. Lack of training for the teachers in the local schools is another big problem. According to her, the good schools with well-equipped science laboratories and well-trained teachers are very far from the community. Leading to high rates of illiteracy within the community.

Other factors identified were that the oil companies located there do not adhere to government laws (environmental laws) as the majority of them do not undertake the Environment Impact Assessment before starting their operations, as they should. Government agencies like Oil Mineral Producing Areas Development Commission (OMPADEC), Federal Environmental Protection Agency (FEPA) and Nigerian National Petroleum Corporation (NNPC), in charge of evaluation and monitoring their activities or operations do not carry out their duties or have not done enough to make sure that these oil companies adhere to environmental laws. Lack of infrastructure, unemployment, inadequate compensation by the oil companies, the effects of disturbing noises and smells during oil discharge from pipelines, coastal erosion (water washing away their houses into the coastal areas), insufficient government interest in community matters and total alienation and marginalization have all been the issue at hand in the oil producing communities.

4.5. QUANTITATIVE DATA ANALYSIS

This section deals with the results of the study. Data was collected from one hundred and fifty (150) community members in Ibeno LGA, thereby providing answers for each objective.

The presentation and analysis of the quantitative data will be largely descriptive, adopting an analytical approach, using frequency count, percentages, tables and graphical approaches.

The first aspect of this research, Section A, deals with the demographic information or personal particulars of the study population. The respondent includes the people residing in the community of study (Ibeno), within the four villages (Upenekang, Mapanak, Iwoachang and Inua Eyet Ikot) chosen for the study. This includes indigene and non-indigenes of Ibeno who have domiciled there for a long period of time, not minding their occupation.

Below are the tables showing the results of the data collected .

TABLE 4.1 POPULATION PATTERN WITH REGARD TO SPECIFIC TOWN DISTRIBUTION

TOWNS	MALE	FEMALE	TOTAL
UPENEKANG	19	21	40
MKPANAK	27	17	44
IWOACHANG	21	12	33
INUA EYET IKOT	14	19	33
TOTAL	81	69	150

Table 3.1, shows the distribution of the sample, which was administered in four major villages in Ibeno chosen for the study, including Upenekang, Mkpanak, Iwoachang and Inua

Eyet Ikot, Amongst 81 males and 69 females, the respondents included indigenes and non–indigenes of Ibeno, who have resided there for a long period of time. This table also shows the total number of males and females in various villages within Ibeno that were chosen for the study as indicated above.

TABLE 4.2 THE SEX DISTRIBUTION FREQUENCY

SEX	FREQUENCY	PERCENTAGE (%)
MALE	81	54%
FEMALE	69	46%
TOTAL	150	100%

From table 3.2 above, it shows the result of gender or sex data collected from the indigenes of Ibeno LGA. It shows that a total of 81 or 54% of the respondents are male, while a total of 69 or 46% of the respondents constitutes females. In other words, a greater percentage of the respondents in the study area or the oil producing communities are male.

TABLE 4.3 THE AGE DISTRIBUTION FREQUENCY

AGE RANGE (YEARS)	FREQUENCY	PERCENTAGE (%)
16-25	20	13.33%
26-35	31	20.67%
36-45	30	20%
46-55	34	22.67%
56 AND ABOVE	35	23.33%
TOTAL	150	100

In table 3.3 above, the age distribution of the respondents that were used in the study is shown. The age range (years) used for the study is stated as follows: 16-25, 26-35, 36-45, 46-55, and 56 and above, with the total frequency and percentage indicated. Following the age distribution used it was discovered that the respondents within the age range of 16-25 were 20 or 13.33%, 26-35 were 31 0r 20.67%, 36-45 were 30 or 20%, 46-55 were 34 or 22.67%, while 56 and above were 35 or 23.33% respectively.

Therefore going by the age distribution, it is discovered that a greater number of respondents from 36 years and above, constituted a frequency of 99 or 66% of the total respondents within the oil producing community. Generally, the data collected for this study shows that the majority of the respondents were mature persons who could really appreciate the problems of an oil producing community. Therefore the migration of the agricultural work force or able-bodied young men and women from their community to urban areas, as well as land

resources degradation occasioned by incessant oil spills in the area, are implicated for the relatively old age of the farmers in Ibeno community.

TABLE 4.4 FREQUENCY TABLE SHOWING DISTRIBUTION BASED ON MARITAL STATUS

MARITAL STATUS	FREQUENCY	PERCENTAGE (%)
MARRIED	96	64%
SINGLE	41	27.33%
DIVORCE	-	-
WIDOW	7	4.67%
WIDOWER	6	4%
TOTAL	150	100

From the data shown in table 3.4 above, it is observed that married people constitute 96 or 64% of the total respondents, while singles were 41% or 27.33%. Widows constituted 7 or 4.67% and widowers 6 or 4% respectively. It is also indicated that there were no divorced persons. In order words this implies that the majority of the respondents are married individuals in the study area because of the high frequency and percentage gained.

TABLE 4.5 FREQUENCY DISTRIBUTION SHOWING EDUCATIONAL LEVEL

EDUCATIONAL LEVEL	FREQUENCY	PERCENTAGE
NO FORMAL EDUCATION	43	28.67%
PRIMARY EDUCATION	36	24%
SECONDARY EDUCATION	41	27.33%
TERTIARY EDUCATION	30	20.00%
TOTAL	150	100

The above table shows that the highest number of the respondents, 43 or 28.6 percent, had no formal education, while 36 of the respondents sampled, or 24 percent of them had only primary education, and 41 or 27.33 percent of the respondent had secondary education and finally, 30 of the respondents or 20 percent of them had tertiary education, which includes either a first Degree or Higher National Diploma (HND), or even a Masters Degree.

Therefore, on the whole, about 71 percent of the respondents had some form of formal education, against 28.67 percent of the respondents who do not have any form of formal education or the other. This is an observation which tends to refute the alarming rate of illiteracy prevalent in rural communities.

TABLE 4.6 FREQUENCY DISTRIBUTION SHOWING OCCUPATIONAL STATUS

OCCUPATIONAL STATUS	FREQUENCY	PERCENTAGE (%)
AGRICULTURAL ACTIVITIES	52	34.66%
TRADING	30	20.00%
PUBLIC SECTOR WORKER	12	8.00%
OIL COMPANY WORKER	8	5.33%
RETIRED	18	12.00%
OTHERS	30	20.00%
TOTAL	150	100%

As indicated in the frequency distribution table above, it could be seen that agricultural activities, had the greatest number of respondents of 52 or 34.66percent, and this is followed by trading and other occupational status with a number of 30 or 20.00 percent. Similarly, public sector workers and those who had retired had 12 respondents or 8.00% and 18 or 12.00 % respectively, this therefore shows that the majority of the people in Ibeno LGA are into various agricultural activities, as well as trying their hands at diverse jobs to make ends meet.

TABLE 4.7 FREQUENCY DISTRIBUTION SHOWING HOUSEHOLD SIZE

HOUSEHOLD SIZE	FREQUENCY	PERCENTAGE (%)
5-8	29	19.33
9-12	58	38.67
13-16	38	25.33
17-20	25	16.67
TOTAL	150	100%

From the table above, a relatively large household size was found in the study. A household size of 9 – 12 persons per household seemed average, and about 38.67% or 58 respondents have a family size that ranged between 9 – 12 persons. About 38 or 25.33% of the respondents had a household size of 13 – 16 persons. So generally it could be seen that Ibeno indigenes have large family sizes, thus supporting, caring and providing for these large families could constitute a social burden.

TABLE 4.8 FREQUENCY DISTRIBUTION SHOWING ANNUAL FARM INCOME (NAIRA), FROM RESPONDENTS WHO INDICATED THAT THEIR OCCUPATIONAL STATUS WAS AGRICULTURAL ACTIVITIES.

ANNUAL FARM INCOME (Naira)	FREQUENCY	PERCENTAGE (%)
19000-34000	34	65.38%
35000-50000	12	23.07%
51000-66000	5	9.61%
67000-82000	1	1.9%
TOTAL	52	100%

As indicated in the frequency distribution table above, the majority of the respondents, from respondents who indicated that their occupational status was agricultural activities (52 respondents), was 34 persons or 65.38%, have a farm income of N19000 - N34000. This indicates that the level of income realized from crop farming by the respondents is very low. This is not unexpected given the size of land holdings observed in the area, as a result of poor quality soils and pollution of the land and inadequate extension services. In fact, the community has now resulted to crude farming methods of crop production as a lot of their farming tools have been destroyed by subsequent oil spillages. It could, however, be seen from the table above, that only one of the respondent, earn N67000 – N82000, which is high. As observed by the researcher, this is as a result of the fact that most of the people in Ibeno community now travel very far away from the town to carry out their farming operations, as oil spill has degraded most agricultural lands within the community and has turned hitherto productive lands into wastelands.

TABLE 4.9 FREQUENCY DISTRIBUTION SHOWING FARM SIZE (HA)

FARM SIZE (hectare)	FREQUENCY	PERCENTAGE (%)
0.5-0.7	40	76.92%
0.8-1.0	8	15.38%
1.1-1.3	3	5.76%
1.4-1.6	1	1.92%
TOTAL	52	100%

The size of farm holdings in Ibeno LGA, from the 52 respondents whom indicated that their major occupation was agricultural activities, is presented in the table above. From this table, it has been revealed that the majority of the farmers have farms of small sizes. However,

76.92% or 40 respondents have farms ranging between 0.5 – 0.7 hectares, 15.38% or 8 respondents have farms ranging between 0.8 – 1.0 hectares, 5.76% or 3 respondents have farms ranging 1.1 – 1.3 and 1.92% or 1 respondents have farm sizes of 1.4 – 1.6 hectares respectively. Such land disparities are as a result of low agricultural growth, which no longer supports commercial and mechanized farming, which used to be their aim of farming, but now exists for mere subsistence farming. Observed by the researcher was also the fact that the majority of the farmers have lost their lands due to increasing soil infertility, as a result of subsequent oil spillages in the community. The bar chart below shows the differences in the farm sizes in the community of study.

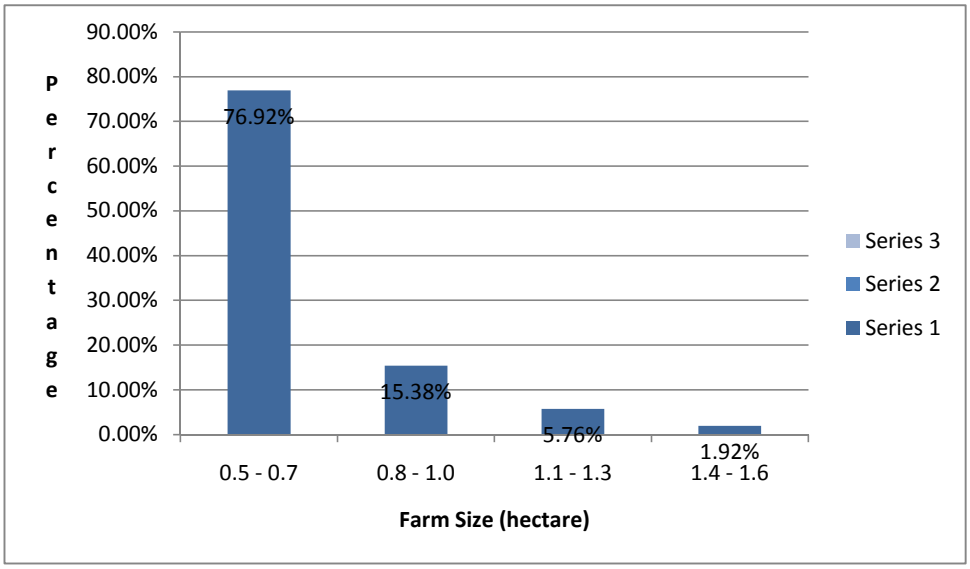

Figure 4.1 BAR CHART SHOWING FARM SIZE DISTRIBUTIONS

4.6 TYPES OF CROPS GROWN BY THE PEOPLE OF IBENO LGA

The respondents were asked what types of crops were grown by them. They indicated that almost all of the thirty eight (52) respondents involved in agriculture basically grow maize, cassava, yam and vegetables on their farms, and only a few, about eight (8), indicated that they grow plantain, palm fruit and cocoyam on their farms. This is because most of the staple food of the community revolves around the four (4) major crops mentioned above (maize, cassava, yams and vegetables).

TABLE 4.10 PIPELINE VANDALIZATION AS THE MAJOR CAUSE OF OIL SPILLAGE

RESPONSES	FREQUENCY	PERCENTAGE
STRONGLY AGREE	100	66.67
AGREE	30	20
DISAGREE	15	10
STRONGLY DISAGREE	5	3.33
TOTAL	150	100

As shown in the table above, the majority of the respondents, 100 (66.6%), strongly agree that vandalization of pipelines is the major cause of oil spillage in the Ibeno community and the reason for such, as gathered, was due to poor compensation to the community from the Nigerian government and the oil companies located in the area. 30 people agreed that vadalization is the major cause of oil spillage in the community, also due to the reasons stated above, and thus are demanding for the review of the oil derivation revenue and increment in the percentage given to the community from the national treasury.

15 people disagree and 5 people strongly disagree that the vadalization of pipelines was the cause of oil spillage, but rather pointed to the poor quality of materials used in the construction of pipelines that are used for oil transportation. They also attributed some of the causes due to the poor topography of the area, which usually leads to massive erosion, thus causing pipes to burst, which should have been checked by the government or the oil companies drilling in their community.

4.7. THE CAUSE OF SOIL DEGRADATION

In order to determine the main cause of soil degradation in Ibeno LGA, the respondents were asked if the rate of soil degradation in Ibeno was as a result of continuous oil spillage. The majority of the respondents, about 118 (78.67%), strongly agreed that the rate of soil degradation in Ibeno LGA was as a result of continuous oil spillage, which has massively affected agricultural production in the area. 30 (20%) of the respondents agreed with this, while 2 (1.33%) respondents disagreed and pointed out that there are other issues that have led to soil degradation in this area. Some of these are massive erosion due to the poor topography of the area, resulting from over drilling, deforestation and inferno from the oil companies. None of the respondents strongly disagreed.

TABLE 4.11 THE OIL COMPANIES' INVOLVEMENT

RESPONSES	FREQUENCY	PERCENTAGE
STRONGLY AGREE	--	--
AGREE	5	3.33
DISAGREE	20	13.33
STRONGLY DISAGREE	125	83.33
TOTAL	150	100

The table above shows some of the response from the question "the oil company involved in the pollution and degradation of this environment has done a lot to ameliorate the problems of the people of Ibeno" and as indicated from the table above, it is clear from the responses that majority of the community members are totally dissatisfied with the level of assistance from the oil companies drilling in their community. 125 (83.33%) respondents strongly disagreed with the performance of the oil companies in ameliorating their problems, but rather, believed that the oil companies enrich themselves and the federal government at the expense of the community. On the contrary, a few, about 5 people or 3.33% of the respondents agreed that the oil companies have met their needs to an extent, in terms of few infrastructure and social amenities as well as bursaries granted (although not so often) to some community members. It is interesting to point out that the 3.33% that shared this viewpoint mostly fell between the age ranges of 45 – 60 (elders). From my observation, the youths believed that this category of people were in 'illegal' partnership with the oil companies and the government.

4.8. THE IMPACT OF CRUDE OIL EXPLORATION AND EXPLOITATION.

In order to determine whether crude oil exploration and exploitation poses other hazards to the Ibeno community, the respondents were asked the question, "crude oil exploration and exploitation does not pose any hazard to the host community". All the respondents stated that they strongly disagree. In other words, the respondents answered in such a way because they generally believe that crude oil exploration and exploitation poses a lot of hazards to the host community, which was also observed by the researcher. The respondents thus mentioned some of the hazards that the exploration and exploitation of crude oil has caused in their community, some of which include: gas flare (9%), destruction of the marine eco-system (17%), erosion (10%), massive destruction of agricultural farm lands (45%), deforestation (12%) and effluent and waste discharge (7%), where the most prominent hazards specified.

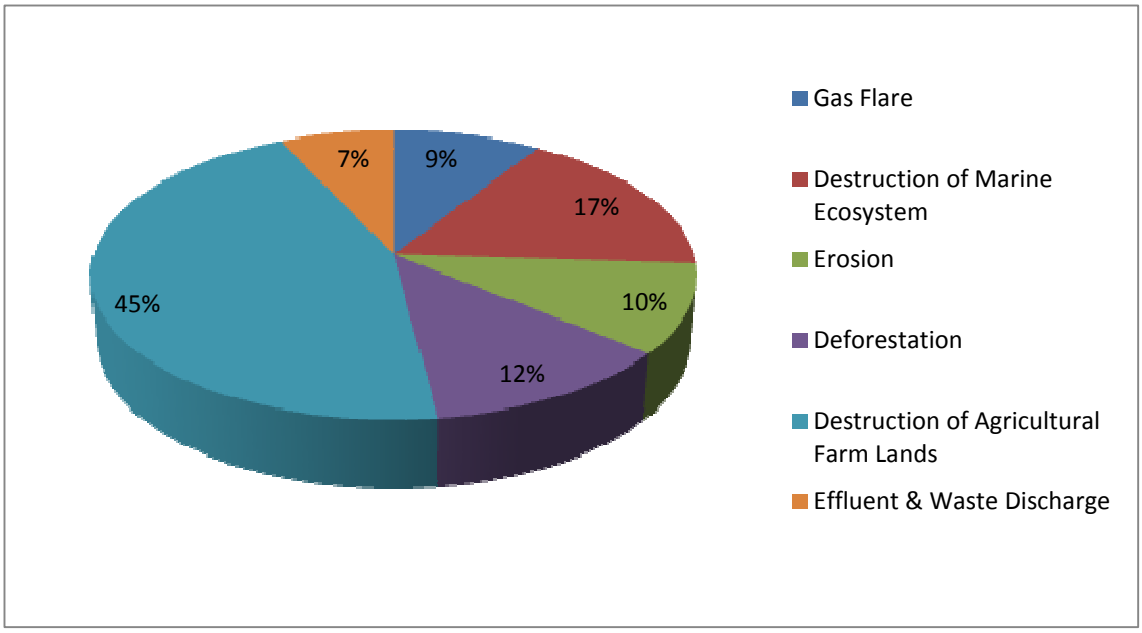

Figure 4.2 PIE CHART INDICATING TYPES OF HAZARDS MENTIONED

4.8.1. The Impact of Oil Spillage on the Socio-Economic Well Being

About one hundred and forty two (142), or 94.67%, of the respondents indicated that they strongly agree that oil spillage has impacted negatively on the socio-economic well being of the inhabitants of Ibeno LGA. While eight (8) or 5.33% respondents indicated that they agree with the above sentiments about this question in the questionnaire, they also feel that other of oil companies' activities, such as gas flare, effluent and waste discharges, seismic surveys, etc. have also greatly affected the community.

4.8.2. The Impact of Oil Spillage on the Socio-Cultural Well Being

The one hundred and fifty (150) respondents indicated that they strongly disagree that the socio-cultural well being of the Ibeno people is not affected by oil spillage. In short, they generally believed that the various incidences of oil spillage in Ibeno LGA have affected the socio-cultural well being of the people in that the oil spillage has adversely impacted the cultural values and social harmony in the community. Some vital reasons given to back their view were that it has led to the extinction and in some cases death of medicinal plants and herbs, which are rooted in their traditional medicine and spirituality, and this has carried very serious spiritual implication and significance within the entire community. Also pointed out by some of the respondents was that oil spillage has seriously destroyed their traditional shrines and forests.

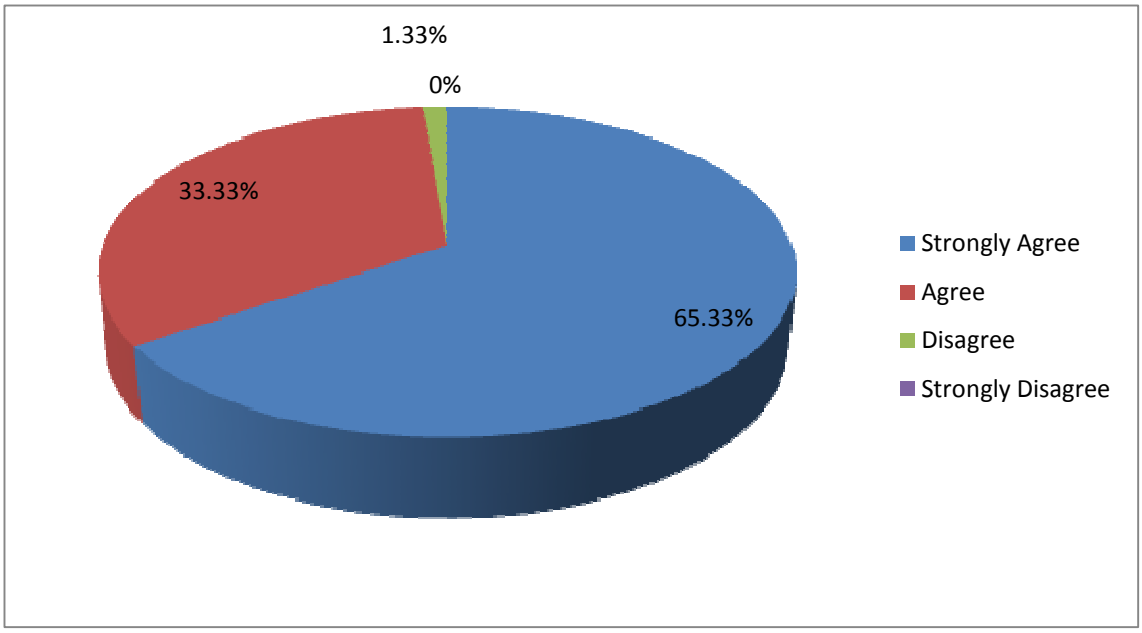

Figure 4.3 OIL SPILLAGE GIVES RISE TO ECONOMIC HARDSHIP AS DAILY/MONTHLY INCOME DROPS

The figure above indicates that 65.33% of the respondents strongly agree that oil spillage gives rise to economic hardship as daily/monthly income drops, while 33.33% agree. However, a minority of 1.33% of the people indicated that they disagreed that oil spillage gives rise to economic hardship as daily and monthly income drops. It was therefore observed from the completed questionnaire, that the minority, 1.33% of the respondents, that disagreed were oil company workers, and that no individual strongly disagreed that oil spillage gives rise to economic hardship as daily/monthly income drops.

4.9. ANALYSIS OF QUESTION 10 – 13

Respondents were asked how oil spillage has degraded the agricultural farmlands and how it has affected the agricultural production returns. Additionally, the effect of pollution on the fishing environment and its consequent effect on the reduction of catch of sea foods and fishing income were addressed. The responses of the people to the above questions are depicted in the chart below.

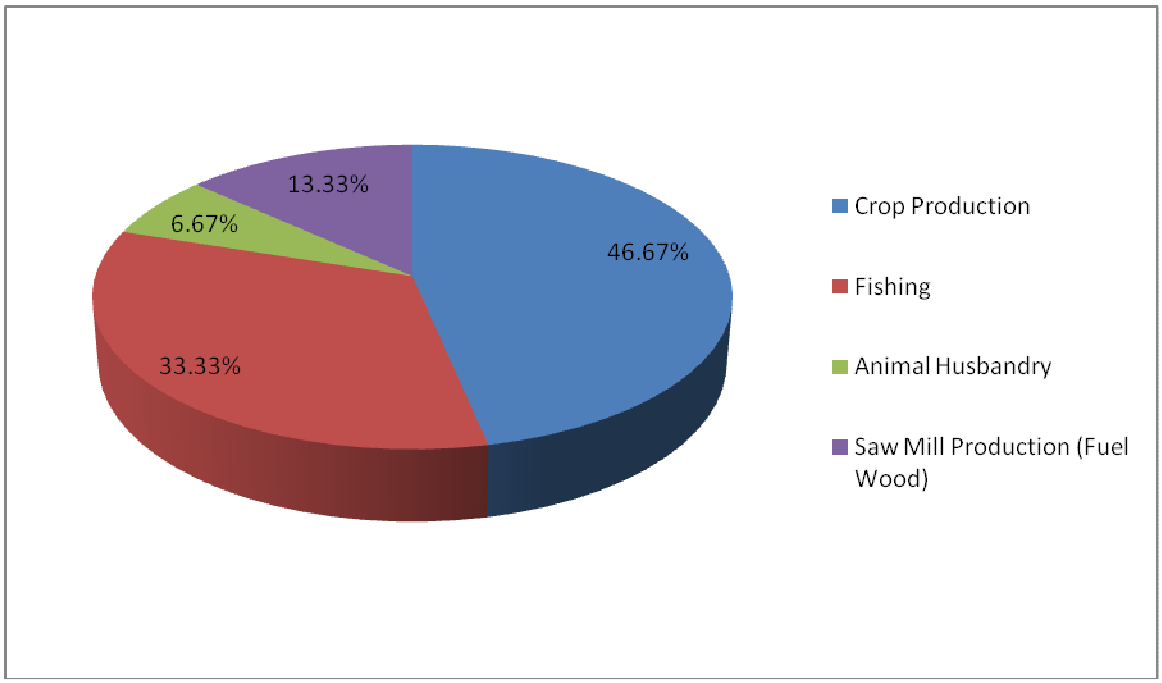

Figure 4.4 REDUCTIONS IN SPECIFIC AGRICULTURAL RETURNS

From the chart above, it shows that 46.67% (70) of the respondents were of the opinion that crop production was most seriously affected during oil spillage. 33.33% (50) of the respondents are of the opinion that fish farming and production is the second highest affected agricultural production return. Only 6.67% (10) agreed that animal husbandry, which mainly involves rearing of cattle, is affected as a result of massive destruction of farmland (grasses and other animal feed) and finally, 13.33% (20) of the people responded to decreased production of saw mill products (fuel, wood) which they attributed to massive deforestation. From the above statistics it can be deduced that the most severely affected area is crop production in the Ibeno community.

TABLE 4.12 OIL SPILLAGES A CAUSE OF UNREST IN THE COMMUNITY

RESPONSES	FREQUENCY	PERCENTAGE
STRONGLY AGREE	29	19.33
AGREE	6	4
DISAGREE	40	26.67
STRONGLY DISAGREE	75	50
TOTAL	150	100

The table above shows some of the responses from the question asked “the unrest in the oil producing communities is caused by oil spillage only”. Evidence from the data reported in the table above revealed that more than half (76.67%) of the respondents believed that the

unrest in the oil producing communities is not only caused by oil spillage. They disagreed and strongly disagreed to the question above. However, 29 (19.33%) of the respondents strongly agreed that the unrest in the oil producing communities is caused by oil spillage only and 6 (4%) agreed also, respectively.

However, some factors were indicated in the questionnaire by the respondents who disagreed and strongly disagreed that the unrest in the oil producing communities is caused by oil spillage only, Some of the additional factors mentioned by the respondents included greediness of the elders/local leaders, other of oil companies' activities (like gas flare, deforestation, the taking over of farm lands by equipment and facilities), land/boundary disputes, oil derivation/revenue allocation and broken promises by the oil companies for compensation. Indicated by some of the respondents is the fact that they are in a state of unrest, which relates to demands made by the youths for employment or contracts and other sharing of the largesse from the oil companies and its contracting firms. This is shown in the figure below.

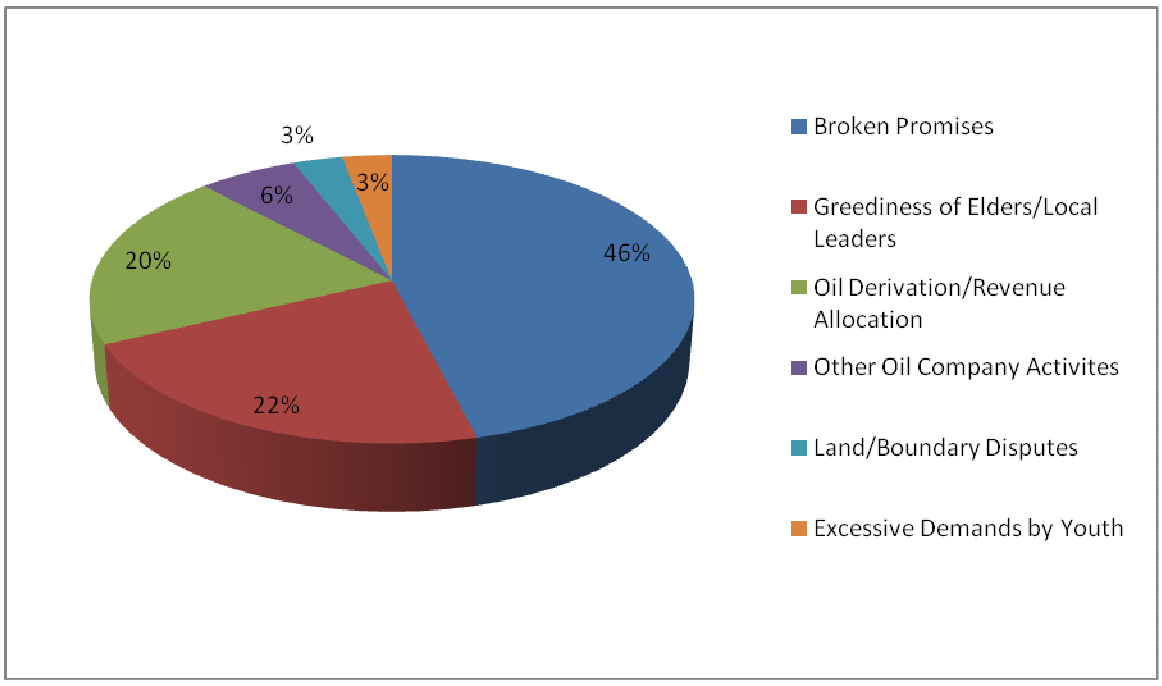

Figure 4.5 REASONS FOR UNREST IN THEIR COMMUNITY

The figure above shows that the unrest in the oil producing communities is majorly as a result of broken promises by the oil companies, which resulted in 46% of the others indicating the following: greediness of elders /local leaders (22%), other oil companies' activities (6%), land/boundary disputes (3%), oil derivation /revenue allocation (20%), broken

promises from the oil companies (46%), demands by the youths for employment or contracts and other sharing of the largesse from the oil companies and its contracting firms(3%).

In other words, ranking order of the factors resulting in unrest in the oil producing communities in the figure, revealed that broken promises from the oil companies ranks first, while greediness of the elders/local leaders ranked second, oil derivation/revenue allocation ranked third, other of the oil companies' activities ranked forth, and finally, land/boundary disputes and demands by the youths for employment or contracts and other sharing of the largesse by the oil companies and its contracting firms, ranked fifth respectively.

4.10. ANALYSIS OF QUESTION 15 – 16

Respondents were asked the following questions oil companies give mass employment to reduce crime rate in the oil communities. And also, question sixteen of the questioner given out stated that "more than enough infrastructures have been provided by the oil companies located in the host community". This question was asked in order to determine if the affected community was adequately compensated with other forms of employment by the oil companies located in their area, as it is generally believed that their source of livelihood has been destroyed.

The majority of respondents 148 (98.67%), indicated that they Strongly Disagree, while a minority of 2 (1.33%) indicated that they agree. In other words, from the above data, there is an implication that the host communities are not adequately compensated for, for the losses that they incurred as a result of oil spillage.

TABLE 4.13 THE RELATIONSHIP BETWEEN THE COMMUNITY AND THE OIL PRODUCING COMPANY

RESPONSES	FREQUENCY	PERCENTAGET
STRONGLY AGREE	2	1.33
AGREE	18	12
DISAGREE	44	29.33
STRONGLY DISAGREE	86	57.33
TOTAL	150	100

The response from the question asked (the relationship existing between the community and the oil producing company is very cordial), is indicated in the table above. The data in the table above indicates that the majority of the respondents, a total of 130 (86.67%), disagreed

and strongly disagreed that the relationship existing between them (community) and the oil company is very cordial. A minority of 2 (1.33%) strongly agreed and 18 (12%) agreed respectively. This thus implies from the above data that the relationship between the community and the oil company is not cordial. It was also observed that the majority of the people who indicated that they agreed and strongly agreed are mainly oil company workers and some middle-aged people, as well as a few from the older age group, between the ages of 46 – 60 Those that indicated that they disagreed and strongly disagreed fell between the ages of 25 – 45.

4.11. MEASURING THE RATE OF COMPENSATION TO SPOLIATION / DEPRIVATION

The respondents were also asked the question “compensations are not commensurate with the rate of loss of livelihood”, in order to know if the compensation gotten from the oil companies or government is measurable to the rate of spoilage/deprivation of the communities’ livelihood.

Out of one hundred and fifty (150) respondents questioned, 141 (94%), indicated that they strongly agreed that compensations are not commensurate with the rate of spoliation /deprivation of their livelihood. 7 (4.67%), agreed while 2 (1.33%) people disagreed. No person strongly disagreed. In summary, the results indicate that the affected community strongly needs a more improved standard of living, as well as enhanced transparency with regards to payments of compensation.

4.12. THE COPING STRATEGIES OF THE HOST COMMUNITY

Respondents were asked which coping strategies they employed to counter the effect of oil spillage. Some options were given as shown in the Figure 4.6, below.

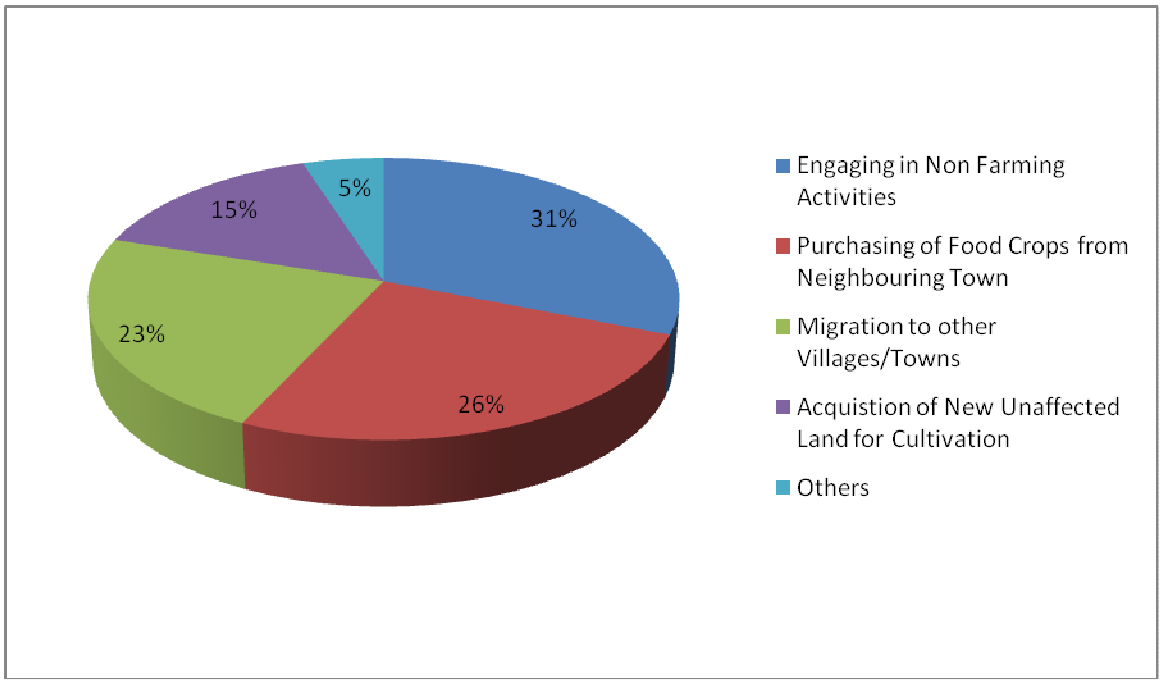

Figure 4.6 COPING STRATEGIES EMPLOYED

As shown in the figure above, it was revealed that 47 (31.%) of the respondents coped with the effect of oil spillage by engaging in non-farming activities, followed by the purchasing of food crop items from an unaffected neighbouring town, which has a representation of 39 (26%). 34 (23%) of the respondents coped with the effect of oil spillage by migrating to other villages/towns and 22 (15%) of the respondents got by following the acquisition of new, unaffected land for cultivation. Finally, 8 (5%), coped by employing other means, including seeking aid from the government and from some non-governmental organizations (NGOs), as well as depending on their relatives for survival.

4.14. EARLY WARNING RECEIVED

Respondents were asked whether they received any special warnings regarding advancing oil spills in the area. It is shown in the table below, that majority of the respondents, ninety one (91), indicated 'No'. In order words, they do not receive any form of warning regarding an advancing oil spill in the area. About a minority of eight (8) respondents indicated that they do not know and fifty one (51), indicated yes, which means that they sometimes receive some form of warning with regards to advancing oil spills in the area. Below is a table indicating the people's responses regarding the warnings received concerning an advancing oil spillage in their area.

TABLE 4.14 WARNING RECEIVED CONCERNING AN ADVANCING OIL SPILL IN THEIR AREA

RESPONSES	FREQUENCY	PERCENTAGE
Do Not Know	8	5.33
Yes	51	34
No	91	60.67
TOTAL	150	100

4.15. PREPAREDNESS STRATEGIES EMPLOYED

Respondents that indicated 'Yes' in the table above, were asked what strategies they employed for readiness in case of an oil spill (with regards to agricultural production). It is thus shown in the figure below that about nineteen (19) of the people whose response was yes, indicated that they engage in early harvesting of agricultural produce, while twenty-two (22) of the people indicated that they engage in appropriate storing of agricultural produce, with eight (8) indicating that they engage in the selling off of large amounts of agricultural produce. Two (2) people indicated that they engage in other preparedness strategies towards readiness in case of oil spill.

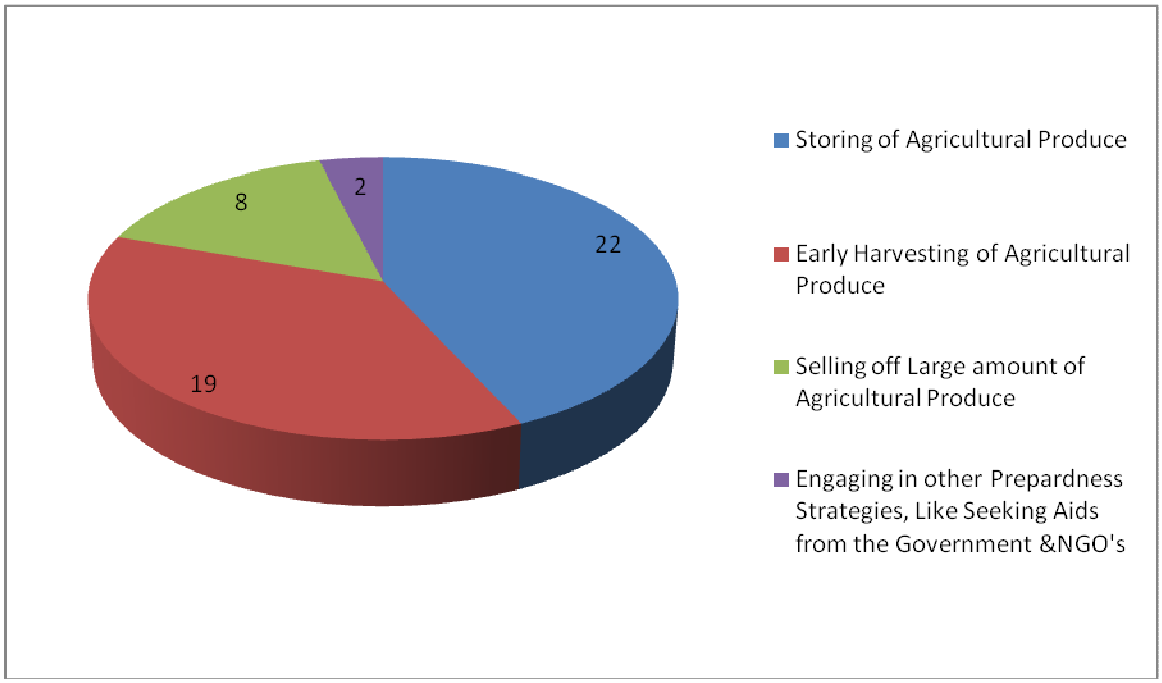

Figure 4.7 PREPAREDNESS STRATEGIES ENGAGED IN BY THE COMMUNITY

As shown in figure 4.6, and also explained above, the majority of the respondents, twenty-two (22), engage in appropriate storing of agricultural produce, while a minority of two (2) people indicated that they engage in other preparedness strategies like seeking aid from the government and other non-governmental organizations (NGOs).

CHAPTER 5

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1. INTRODUCTION

This chapter presents the discussion, recommendations and conclusion of the study. This involves mainly with information derived from chapter two and three of the research work. This includes, basically, the literature review (chapter two), data analysis and presentation (chapter three). Other general recommendations were made applying the Disaster Risk Reduction Measures/practices, mainly directed towards the different parties (the host community, oil companies and the Nigerian Government) who are involved in oil matters. And finally, some other important recommendations directed to the oil companies and the Nigerian government specifically, was made, in order for them to effectively address the issues surrounding the effects of oil spillage, generally, in the country.

5.2. DISCUSSION

Concluding from the result of the study carried out, the primary cause of oil spillage in Ibeno LGA, was the vandalization of oil pipelines by the youths within the community who are presently displeased with the conducts of the chiefs and community leaders. This is because they are believed to be the custodians and the keepers of the community assets, and are thus now seen as the greatest sabotage facing the community. Also, their relationship with the oil companies and the government to the detriment of community development has caused a lot of worries in the community, which has resulted in the vandalization of oil pipelines and other oil installations, as a negative means of adaptation and expression of their grievances.

The summary from the focus group discussion (FGD) in chapter three revealed that the voice of the people as represented by MENDS (Movement of Emancipation of Niger Deltas) is also singing the same song of sabotage about the elders of the community and the government, as it is believed that they put their personal interest before the communities.

In other words, from the research which exclusively concerns the impact of oil spillage on agricultural production in Ibeno LGA, it was found that the impact of oil spillage on the agricultural production in the community of study is huge. According to the results in chapter four of this study, data presentation and analysis,it could be seen that most of the indegines are involved in agricultural practices and are of the opinion that this sector is mostly severly affected. And this has resulted in them engaging in other occupational status, or to pursue

alternative options of occupation for survival, such as petty trading, motorcycle transport operators (Okada riding), et cetera. This has also resulted in distorted family units and community immorality, as a lot of youths, including the female indigenes, have taken to prostitution as a means of livelihood and survival. The young men amongst them have involved themselves in burglary, rape, and vadalization of pipelines, as well as the adoption of oil expatriates in exchange for money.

All the above mentioned problems have led to poor standard of living and high crime rate as well as high incidences and prevalence of HIV/AIDS in the community of study.

The exploration of oil in this community has also impacted negatively on the cultural heritage, as mentioned in chapter three of this study (Data Analysis), and has therefore led to further erosion in the cultural norms and beliefs of the people. Moral decadence has also become more visible in the community of study.

Another element of discussion was the economic burden associated with oil spillage on agricultural production in Ibeno LGA, as they have paucity of harvest from their farms, as well as massive deaths of aquatic lives and some domestic animals that are being reared either for domestic or commercial purposes. These directly or indirectly depend on agricultural products, such as grain for poultry. This has further eroded the quality of life of the inhabitants of Ibeno LGA.

From the result of this study, it has been indicated that the inhabitants of Ibeno LGA have employed various coping strategies as well as preparedness strategies towards the unanticipated issues of oil spillage in their community. Therefore, since this research is based mostly on the impact of oil spillage on agricultural production, some of the coping strategies employed or adopted by this community of study, for mitigating the impact of oil spillage as found out from this study, includes engaging in non-farming activities, purchasing of food crops/items from unaffected neighboring towns, acquisition of new unaffected land for cultivation, migration to other villages/towns and other means like seeking aid from governmental and non-governmental organizations.

Therefore other preparedness strategies employed by the community towards maximizing their standard of living include early harvesting of agricultural produce, engaging in appropriate storing of agricultural produce and selling off of agricultural produce.

In summary, Ibeno LGA is faced with a lot of problems associated with oil spillage, and this research has helped to uncover some of the factors associated with the vandalization of oil

pipelines, the impact of oil spillage on the community, as well as their 'preparedness plans' to avert such mayhem.

The limitations of this study have included lack of accessibility to all the villages in the community of study, and that most of the results and conclusions from this study have been extrapolated from the projections and findings from the four (4) major villages in the community of study. One cannot remove the issue of self bias from the research participant who is also from a different oil producing community in Nigeria, and who also suffers the same negative impact as that seen in Ibeno LGA. In essence, the research participant's emotional feelings can be a factor in the result analysis, which is a confounding variable that can affect the result.

5.3. RECOMMENDATIONS

Based on the above findings and subsequent discussions, the following recommendations are made to different parties involved in oil matters. These include the oil companies and the government of the federal republic of Nigeria, since all contribute directly and indirectly to the cause and effect of oil spillage in the community

It is suggested that a multi-sectoral approach to disaster management be employed, which basically involves preventing the risk of disasters, mitigating the severity of disasters, emergency preparedness, as well as effective responses to disaster, and post–disaster recovery and rehabilitation. These measures or practices should be adopted by the government of the Federal Republic of Nigeria in order to limit the impact of future chemical disasters, and also for effective and efficient management of it in Ibeno Local Government Area as explained below.

Figure 6.1. DISASTER RISK REDUCTION MEASURES / PRACTICES

Source: (Tshwane Disaster Management Plan, 2010).

It is very important that a permanent disaster management institution be established in Ibeno LGA, since it is an area mostly affected by chemical hazard. This institution will help to draw out a specific chemical hazard plan for the affected area.

5.3.1. General recommendations

Below are general recommendations that have been made, applying Disaster Risk Reduction Measures/Practices directed to all parties (the community, oil companies and government) involved in oil matters.

5.3.1.1. Preparedness: This includes disaster management activities and measures taken in advance to ensure effective response to the impacts of hazards, including the issuance of timely and effective early warnings, the temporary evacuation of people and property from the threatened location. Anthony, K. (2008).

- **Rehearsals:** It's important to review and prepare periodically and update disaster preparedness and contingency plans and policies at all levels, with a focus on the vulnerable groups. And it is also necessary to promote regular disaster preparedness exercises, with a view of ensuring rapid and effective disaster response.
- **Knowledge and Development:** This includes education, training, research, etc. The use of knowledge, innovation and education to build a culture of safety at all levels in Ibeno LGA is very necessary both for the people in the community, including the vulnerable groups, and it should even be extended to the oil company workers situated in Ibeno LGA. Thus, disaster can be substantially reduced if the entire body people as stated above are well informed and motivated towards a culture of disaster prevention and resilience, which in turn requires the collection, compilation and dissemination of relevant knowledge and information on hazards, vulnerability and capacity. Therefore there should be development on training/education of the oil workers, the use, application and affordability of updated information and technology and related services in the aspect of oil spillages, in order to support disaster risk reduction. It is very important to provide easily understandable information on disaster risk and protection options, especially to the Ibeno community. Such will enable the indigenes to take action in order to reduce risk and build resilience. This information should incorporate relevant traditional and indigenous knowledge and information on heritage, which should be tailored to suit different target audiences, taking into account cultural and social factors.

  The update training or update courses of oil workers should especially be directed to the engineers, which must include the maintenance and installation operators in the oil company. The training should be directed towards the appropriate and recent methods in the installation and maintenance of operation machines, and it should also include an oil care campaign, working in particular to understand the causes of oil pollution, to improve facilities for recycling waste oil and to improve delivery procedures. It should also produce a wide range of pollution prevention materials for the oil industry, giving advice on the storage, handling and use of oil. All this will help to reduce oil spill in the environment. Another important aspect to develop would be equal access to appropriate training and educational opportunities for women and vulnerable constituencies and to promote gender and cultural sensitivity training as integral components of education and training for disaster risk reduction. Government should release sufficient funds to cover future costs for upgrading training courses

and maintaining equipment should be secured. The training and seminars, or basic education courses, should include other governmental and private organizations concerned. This will help in the strengthening of the organizational capacity and the training focused on the targeted group or circumstance within the community.

Finally, it is necessary to promote the implementation of programs and activities, for example the inclusion of disaster reduction knowledge in relevant sections of school curricula at all levels and the use of other formal and informal channels to reach youths, children and women. These will also aid in the learning of how to minimize the effects of hazards, especially that which is very common in this area, and to educate the pupils on how to cope when the disaster occurs, so that they (community) can be independent. That is the act of being able to assist themselves before aid comes via the government or the oil companies. And this comes to the fact that there is a need for the development of community-based training initiatives, considering the role of volunteers as appropriate, to enhance local capacities to cope with such disasters affecting the community.

Other preparedness strategies that should be considered include institutional frameworks, which highlights the need to strengthen policy and technical and institutional capacities in local disaster management. There is also a need for an information system, which includes the development and implementation of a targeted information delivery mechanism with a two–way flow, allowing appropriate advice and guidance to teach the community on the importance of a safe environment. That is the act of promoting exchange of information and coordination among early warning, disaster risk reduction, and development teams, with the aim of fostering a holistic approach towards disaster risk reduction.

5.3.1.2. Mitigation: Mitigation is inclusive of a wide range of measures that contribute in diverse ways to the prevention, control, containment and minimization of risk. The following mitigation measures are recommended:

- **Financial Tools:** it is important to promote the development of financial risk-sharing and risk-transfer mechanisms, particularly insurance and reinsurance of the communities' properties, including their farmlands, against disaster. It is also

important for the application of measures for disaster risk reduction. These insurance schemes need to be complemented by other low-cost risk sharing mechanisms, such as kinship networks, micro finance, skill acquisition centers and investment in small and medium enterprises and, finally, public works programs to increase coping capacities of Ibeno LGA. Additional tools and financial incentives are necessary to promote proactive disaster risk reduction investment.

- **Early warning:** Early warning systems are essential investments that can protect and save the lives, property and livelihoods of the Ibeno community and also it will contribute to the sustainability of development and will be far more cost-effective in strengthening the coping mechanisms or coping capacity of the vulnerable people (people affected by this hazard). It will be far more helpful to the people of the Ibeno community as primary reliance on post-disaster response and recovery. This is recommended because, from the data collected from the community of study, people where asked if they received any form of warning concerning advancing oil spill in their area, The majority of the respondents, ninety one (91) of them or 60.67%, indicated that they do not receive any form of warning before the incident of oil spillage in the community, but this can be explained by the nature of the most common cause of oil spillage, which is basically man made (oil vandalization) – community dissidents whose activities are usually illegal and undercover.

  Therefore, this recommended early warning system should be people centered, which means that it should be timely and understandable to those at risk and it should take into account demographic, gender, cultural and livelihood characteristics of the Ibeno community. This early warning will aid the people of Ibeno in reducing disaster risk, because if they are warned to vacate from hazardous areas, for example, areas very close to where crude oil pipelines come out on the earth's surface or protrude, they will be safe in the case of the rupturing of those pipelines as a result of an accident or leakage that would lead to oil spill in the environment.
- **Networking and partnerships:** In order to develop risk reduction options it is essential to achieve safe conditions by strengthening the livelihoods of the host community. This can be done by the host community being involved in

partnership with the oil company; this will thus make partnership formation an imperative and the dominant strategy for managing issues of corporate-community relation. In this context, the oil company and the community development partnership initiatives, as well as the implementation partnership, is essential. Being involved in agricultural partnerships, the oil company would provide or contribute money, while the community donate hectares of land where the project is located, all the while with the project bearing the cost of the running. This is the kind of project that will help improve the livelihood of the people.

5.3.1.3. Response / Recovery: The oil company should engage in other philanthropy and social investments, such as supporting the education in this host community via construction and renovation of classroom blocks, donation of science equipment and the provision of financial incentives for teachers that agree to teach in this riverine area, provision of relief aid (food and clothes) and provision of employment opportunities. Also, the government should promote food security as an important factor in ensuring the resilience of this community to hazards, because this hazard has weakened agricultural based livelihood. Thus reconstruction and rehabilitation should be considered.

Below are recommendations especially directed to the oil companies and the Nigerian Government, in order for them to effectively address the issues surrounding the effects of oil spillage in the host community.

5.3.2. RECOMMENDATIONS TO THE OIL COMPANIES

- The oil companies should, enhance, as well as operate in transparency, and enable independent monitoring of their activities, that is the companies must open their records, which may include their agreements with the local communities, their environmental performance and their various investments in Nigeria, to the local, national and international NGO'S as well as Independent monitors.
- Community involvement or participation should be considered in matters affecting them. Companies should ensure that the widest possible consultation of the people who will be affected by their operations is drafted in their planning, as well as ensuring that their consultation with the host community is transparent, free and fair.
- They should ensure that oil operations are carried out in accordance with all local environmental legislation in force in Nigeria, or with international standards. It is recommended that the oil companies located in these oil producing areas should

ensure that they and their subcontractors stop any activities which support or encourage the authorities to abuse human rights.

- They must ensure that EIAs are made available in an accessible manner to concerned communities and individuals.
- The oil companies should engage in preventative measures to mitigate or minimize the risk of oil spills, like investing the adequate and regular maintenance of their oil installations and the replacing of old pipes, as well as improving the security agencies guarding their various installations (to prevent the vadalization of pipelines).
- The oil companies should be responsible for the environmental and human health impact of all their activities in the host communities.
- They should review their various programs of community assistance to ensure that development projects are planned by people who are professionally trained.

5.3.3. RECOMMENDATIONS TO THE NIGERIAN GOVERNMENT

- It is important for the Nigerian government to undertake a review of laws affecting the relationship of oil companies with the host communities, which includes the Land Use Act, EIA Decree and the Petroleum Production and Distribution Act, as well as other relevant laws – in other words, regulating the payment of compensation for damage to livelihoods caused by oil operations with the view to ensuring that those adversely affected are adequately compensated and protected by due process of law, as well as ensuring that all relevant bodies, respect human rights in their operations or activities.
- Special provision should be made for inter-disciplinary studies on the socio-economic and health aspects of the oil industry in the country.
- It is recommended that the Nigerian government should provide a policy that would create cottage industries and manufacturing industries in oil producing communities and other rural communities, in order to generate “off-land” employment, in an attempt to stabilize the rural population.
- Government should establish a special relief agency consisting of professionals, to meet the contingency needs of the affected individuals or the victims in the event of oil spillage. The relief distribution should vary inversely with size of impact on the beneficiaries.
- The government should enhance and encourage free circulation of information, that is; the human rights monitors and agents of the press, should be given free

passage throughout Nigeria, as well as access to records, needed to document reported killings, injuries and other human rights abuses.

- Government should ensure proper enforcement of legislation related to immediate clean up of oil spill when it occurs.
- Government should ensure that a mechanism will be created that will redress violations of human rights and the right to an effective remedy by a competent authority. This should include rehabilitation, reconstruction, restitution, adequate compensations, and guarantees of non-repetition.

In all cases, it is suggested that a multi-sectoral approach to disaster management, which includes preventing the risk of disasters, mitigating the severity of disasters, emergency preparedness, a rapid and effective response to disasters, and post–disaster recovery and rehabilitation (Disaster Management Act, Number 57 of 2002), be integrated or adopted by the government of Nigeria, for effective and efficient oil spill mitigation in the oil producing communities. Government should seek the assistance of various international organizations (National Disaster Management Authorities, United Nations, etc.).

5.4. CONCLUSION

In the view of the study, it was revealed that crude oil exploitation and production has a negative and statistically significant effect in the Ibeno LGA,, thereby leading to a high rate of environmental degradation in these communities.

The oil producing communities should be the subject of particular by the government and even by the various oil companies located in their community. This is because in oil producing communities, with special reference to the community of study (Ibeno), where this study was carried out, which consisted of the impact of oil spillage on agricultural production, both primary and secondary data obtained from 150 respondents residing in Ibeno was obtained. It was drawn randomly from four major villages (Upenekang, Mkpanak, Iwoachang, and Inua Eyet Ikot). The study therefore revealed that the indigenes have suffered a lot of impact on crop yield, land productivity and farm income in a manner consistent with economic expectation, as well as issues of polluted air and water resources, degraded forests and very high atmospheric temperatures for long periods of time.

The above points to the fact that subsequent oil spillages in Ibeno LGA have given rise to unproductive soil, thereby killing the people's interest in agricultural activities, most especially crop farming or production.

Also the study sought to ascertain to what extent the socio-economic activities of the Ibeno people are affected by oil spillage. The result revealed that oil spillage has affected the socio-economic activities of the people, thereby inducing antagonistic relationships between oil companies and their host community. The study has also ascertained that oil royalties do not significantly affect social development of this producing community, but it does carry some effect, however insignificant.

In other words, the implications of this is that absolute care, adequate and an up-to-date contingency plan must be put in place to ensure that the environment and its resources are not endangered by the activities of the oil companies. Also, it is important that government should organize youth/adult enlightenment programs, as well as ensure that various literacy programs are carried out by professionals and are done frequently in the community. These courses or programs should basically be based on enlightenment of the people on the general dangers or effects of oil spillage on the environment, as well as its negative effects on the people in the community at large. This will thus help to reduce the major cause of oil spillage in Ibeno which this study has revealed is as a result of pipeline vadalization by the community youths primarily. Conclusively, in order to halt or minimize the continual degradation of this community, which has become unbearable to the people, the government must play a leading role by enacting and enforcing environmental laws that will protect the oil producing communities, as well as guarantee the affected communities of a better livelihood.

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APPENDIX 1

DISASTER RISK MANAGEMENT TRAINING AND EDUCATION CENTRE FOR AFRICA.

DEPARTMENT OF NATURAL AND AGRICULTURAL SCIENCES

UNIVERSITY OF THE FREE STATE

BLOEMFONTEIN

RESEARCH DISSERTATAION REPORT QUESTIONNAIRES

QUESTIONNAIRES FOR EVALUATING THE IMPACT OF OIL SPILLAGE ON AGRICULTURAL PRODUCTION: A CASE STUDY OF IBENO LOCAL GOVERNMNET AREA OF AKWA IBOM STATE.

Dear Respondent,

I am a second year master's student of disaster risk management in the department of natural and agricultural sciences of the University of the Free State.

The questionnaire is aimed at collecting information on the topic "The impact of oil spillage on agricultural production: A case study of Ibeno Local Government Area of Akwa Ibom State".

Note that if you agree to fill in this questionnaire, it means you have automatically given your consent. I shall be very grateful if you will co-operate and sincerely respond to the questions and statements below. Please be assured that all information so collected will be solely used for academic purposes and will be treated as confidential. If you have any question for clarity, please contact the principal investigator, Asoya Sandra, on this number: 078 367 9818.

Thank you for your anticipated cooperation.

RESEARCH DISSERTATION REPORT QUESTIONNAIRES ON THE IMPACT OF OIL SPILLAGE ON AGRICULTURAL PRODUCTION: A CASE STUDY OF IBENO LOCAL GOVERNMENT AREA OFAKWA IBOM STATE IN NIGERIA.

PLEASE COMPLETE THE FLLOWING QUESTIONS BY MARKING THE SPACES PROVIDED WITH A TICK (√) OR FILLING UP THE SHORT ANSWER QUESTIONS AS REQUIRED BELOW.

SECTION A

PERSONAL PARTICULARS

NAME OF VILLAGE: _____

GENDER

MALE ☐

FEMALE ☐

AGE

16 – 25 ☐

26 – 35 ☐

36 – 45 ☐

46 – 55 ☐

OVER 55 ☐

MARITAL STATUS

MARRIED ☐

SINGLE ☐

DIVORCED ☐

WIDOW ☐

WIDOWER ☐

LEVEL OF EDUCATION

NO FORMAL EDUCATION ☐

PRIMARY EDUCATION ☐

SECONDARY SCHOOL EDUCATION ☐

TERTIARY EDUCATION ☐

OCCUPATION ☐

CROP CULTIVATION ☐
FISHING ☐
LIVESTOCK SALES ☐
TRADING ☐
PUBLIC SECTOR WORKER ☐
OIL COMPANY WORKER ☐
RETIRED ☐

OTHER (PLEASE INDICATE): _____
_____

HOUSEHOLD SIZE
5 – 8 ☐
9 – 12 ☐
13 – 16 ☐
17 – 20 ☐

ANNUAL FARM INCOME (N**)**
19000 – 34000 ☐
35000 – 50000 ☐
51000 – 66000 ☐
67000 – 82000 ☐

FARM SIZE (ha)
0.5 – 0.7 ☐
9 - 12 ☐
13 – 16 ☐
17 – 20 ☐

SECTION B

INTRUCTIONS: PLEASE READ THE FOLLOWING STATEMENTS AND RATE THEM BY TICKING (√) THE COLUMN THAT BEST CORRESPONDS WITH YOUR RESPONSE.

OIL SPILL IMPACT	
Q1	What type of crop/s do you grow? 1. Vegetables ☐ 2. Maize ☐ 3. Cassava ☐ 4. Yams ☐ 5. Plantain ☐ 6. Palm Fruits ☐ 7. Coco Yams ☐
Q2	Do you think that pipeline vandalization is the major cause of oil spillage in Ibeno LGA? ☐ 1.Strongly Agree ☐ 2.Agree ☐ 3.Disagree ☐ 4.Strongly Disagree
Q3	The rate of soil degradation in Ibeno LGA is as a result of continuous spillage. 1.Strongly Agree ☐ 2.Agree ☐ 3.Disagree ☐ 4.Strongly Disagree ☐
Q4	The oil company involved in pollution and degradation of this environment has done a lot to ameliorate the problems of the people of Ibeno. 1.Strongly Agree ☐ 2.Agree ☐ 3.Disagree ☐ 4.Strongly Disagree ☐
Q5	Crude oil exploration and exploitation does not pose any hazard to the host community. ☐ 1.Strongly Agree ☐ 2.Agree 3.Disagree ☐

	4.Strongly Disagree ☐ If Strongly Disagree (please specify): _____
Q6	Oil spillage has impacted negatively on the socio-economic well being of the inhabitants of Ibeno. ☐ 1.Strongly Agree ☐ 2.Agree ☐ 3.Disagree ☐ 4.Strongly Disagree ☐ If Strongly Agree or Agree (please specify): _____
Q7	The socio-cultural well being of the Ibeno people is not affected by oil spillage. 1.Strongly Agree ☐ 2.Agree ☐ 3.Disagree ☐ 4.Strongly Disagree ☐ If Strongly Disagree or Disagree (please specify): _____
Q8	Oil spillage gives rise to economic hardship as daily/monthly income drops. 1.Strongly Agree ☐ 2.Agree ☐ 3.Disagree ☐ 4.Strongly Disagree ☐
Q9	Oil spillage has degraded the agricultural farmlands. 1.Strongly Agree ☐ 2.Agree ☐ 3.Disagree ☐ 4.Strongly Disagree ☐
Q10	Oil spillage has generally reduced agricultural production returns. 1.Strongly Agree ☐ 2.Agree ☐ 3.Disagree ☐ 4.Strongly Disagree ☐
Q11	Oil spillage has polluted the fishing environment 1.Strongly Agree ☐ 2.Agree ☐ 3.Disagree ☐ 4.Strongly Disagree ☐
Q12	The pollution of the marine eco-system reduces the catch of sea foods and reduces

	the fishing income. 1.Strongly Agree 2.Agree 3.Disagree 4.Strongly Disagree	☐ ☐ ☐ ☐
Q13	The unrest in the oil producing communities is caused by oil spillage only. 1.Strongly Agree 2.Agree 3.Disagree 4.Strongly Disagree If Disagree or Strongly Disagree (please specify): _____	☐ ☐ ☐ ☐
Q14	Oil companies provide mass employment to reduce the crime rate in oil communities. 1.Strongly Agree 2.Agree 3.Disagree 4.Strongly Disagree	☐ ☐ ☐ ☐
Q15	More than enough infrastructures have been provided by the oil companies located in the host community. 1.Strongly Agree 2.Agree 3.Disagree 4.Strongly Disagree	☐ ☐ ☐ ☐
Q16	The relationship existing between the community and the oil producing company is very cordial. 1.Strongly Agree 2.Agree 3.Disagree 4.Strongly Disagree	☐ ☐ ☐ ☐
Q17	Compensations are not commensurate with the rate of loss of livelihood. 1.Strongly Agree 2.Agree 3.Disagree 4.Strongly Disagree	☐ ☐ ☐ ☐
Q18	What are the coping strategies employed by the host community against the effect of oil spillage. 1.Migration to other villages/towns 2.Purchasing of food crops from unaffected neighbouring towns	☐ ☐

Q19	3.Acquisition of new unaffected land for cultivation ☐ ☐ 4.Engaging in non-farming activities Others (please specify): _____ According to your experience, do you receive any special warning concerning an advancing oil spill in your area? 1.Do not know ☐ 2.Yes ☐ 3.No ☐ If your response to question 20 above was “Yes”, what preparedness strategies do you engage in for readiness in case of oil spill with regards to agricultural production? 1.Early harvesting of agricultural produce ☐ 2.Appropriate storing of agricultural produce ☐ 3.Selling off of large amounts of agricultural produce ☐ Others (please specify): _____ **THANK YOU VERY MUCH FOR YOUR TIME AND RELEVANT RESPONSES.**	