OIL SPILLAGE, ENVIRONMENTAL POLLUTION AND THE NIGER DELTA ECONOMY

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CERTIFICATION

This is to certify that the project, **OIL SPILLAGE, ENVIROMENTAL POLLUTION AND THE NIGER DELTA ECONOMY** was written by **FAVOUR AGBABUWE** with the Matriculation Number **SSC1707964**, has been read and accepted in partial fulfillment of the requirements for the award of Bachelor of Science (B.Sc.) degree in Economics.

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DEDICATION

This work is dedicated to Almighty God, the giver of life, the sustainer of soul, the creator and protector of the universe, for His love, mercy and grace towards me, for being my strength, for seeing me through my stay in University of Benin and during my project. May His name be glorified.

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ABSTRACT

The coastal area of Niger Delta is the home of oil exploration and exploitations. So it is open to oil spillage arising from oil damage from local inhabitants, ageing pipeline, blow out of flow station, cleaning of tanks and others. The most dangerous form of oil spillage is the damage of pipeline. The Niger Delta, an ecosystem that contains one of the highest concentration of biodiversity on the planet, in addition to supporting abundant flora and fauna, arable terrain that can sustain a wide variety of crops, lumber or agricultural trees, and more species of freshwater fish than any ecosystem in West Africa. It is also sad to note that it has speculated that the region could experience a loss of 40% of its inhabitable terrain in the net thirty years as a result of extensive dam construction in the region. So, the aim of this project is to look for this unfortunate problem and explore possible solution to problem from a legal perspective. The oil spillage has been a source of concern to the federal government due to the environment impact it has on the area, and has sure set up some ways to curb the environmental pollution in hazardous to the citizens living in that region. A number of federal and state agency deals with oil spillage in Nigeria. These agencies include; National Oil Spill Detection and Response Agency, Federal Department of Petroleum Resource (DPR), The Federal Ministry of Environment, State Ministries of Environment, National Maritime Authorities. There are also the "Clean Nigeria Association". These agencies have to deal with the issue of oil spillage in Niger Delta and Nigeria at large. In conclusion, this work will attempt study the environmental pollution caused by oil spillage and how it has affected the Niger Delta Economy, in the end given some recommendation to make the situation better and still maintain a healthy business environment.

CHAPTER ONE

INTRODUCTION

1.1 Research Background

Oil spillage has been a trouble since the discovery and drilling of oil in the Niger Delta since 1958 and its environmental pollution is something that has followed side by side it. Environmental pollution in the Niger Delta region of Nigeria is mostly that of oil pollution which is as a result of oil spillage. Oil spillage is a normal occurrence in every oil company day to day activities. Oil producing companies are those companies that engage in oil activities, these activities leads to leakage, these activities involves oil discovery, transport by vessels, refining of oil. Oil spills can be cause by accidental spill of fuel, oil in it raw state or sabotage of oil (Peter C. Nwilo and Olusegun T. Badejo). Oil spill through accidental spill of fuel occurs when fuel are being transported by ship, this lead to pollution of water especially if oil being transported are in quantities, the transporting ship on the other hand may not be in good shape in terms of cracks, leading to oil spill. On the other hand sabotage of oil places, when the oil pipeline are deliberately destroy by individual, this is done most time when the individuals intend to steal from the oil company or distort the activities due to their demand not being met, they can also do this to sell the oil in the black market or for political and military advantage. Oil spillage could occur on water and as well as land, the oil spillage that occurs on water is more disastrous than that on land, this is as a result of the wide effect of such cleanup process cost. Oil spill has occurred in other

part of the world where crude oil deposit is found which Nigeria is not exclusion. In Nigeria oil spillage is rampant in the Niger Delta which is the heart of crude oil in Nigeria. There are different estimates of oil spill in the Niger Delta, that it would not be far from the truth to say that an estimate usually made without adequate information still do not match the scale of the horrors. Department of Petroleum Resources (DPR), an estimated 1.89 million barrels of crude oil was spills between the year 1976 and 1996 from an overall of 2.4 million barrels spilled in 4,835 incidents. Since the discovery, exploration and exploitation of oil in Nigeria, oil pollution as a result of oil spillage has being an environmental issue that has afflicted the Niger Delta environment. Oil pollution cause by oil spillage can cause serious consequences for marine environment which can be dismal for the survival of the animal life and the plants therein, which in turn affect the livelihood and quantity of life of the inhabitants.

Over the years, the Issues of environmental degradation has a massive attention on which by man's activities which adversely affect the lives of plants and animals on all sphere which include land, water and air even the livelihood of people. The issues of crude oil exploration is one activity that has brought up considerable interest across the world especially in oil producing nations like Nigeria and especially in the Niger Delta area in Nigeria. Though the importance of crude oil after it discovery in Nigeria in the year 1958 in Oloibiri has being overwhelming to the Nigeria economy but that will not bring us to the negligence of it effect on the environment of the exploratory in

Nigeria, the exploration of crude oil is one of the activity that has affect the environment negatively especially when the accident of spillage of oil. Due to the impact of crude oil operation in the environment, actions has being taking in order to regulate the activities of crude oil exploration across the globe to prevent the high risk of oil spillage and the environmental hazard that follows after. However, the exposure of risk has not been helped by the player in the oil industry who pushes for the "liquid gold" thereby putting pressure in the oil producing communities and the surrounding environment. According to Egwu (2012), one of the factor that cause discharge of oil to the environment is the unethical engineering operations practiced by industries involved.

The disaster of oil spillage on the Niger Delta environment cannot be overlooked, the effect is still very much written on the face of environment, the effect of oil spillage is suffering that both the developed and developing nations face, example is the Exxon Valdez oil spill which happened on 24th of March 1989 in the prince William sound, Alaska, it as an estimate of about 260,000 to 750,000 barrels of crude oil spill (Skinner, Samuel K, Reily, William, May 1989), also the BP deep-water horizon oil spill which happened 20th April 2010 in the Gulf of Mexico, this oil spill was caused an oil discharge for 87 days and a total estimated discharge of 4.9 million barrels. The gulf of Mexico deep water horizon spillage is said to be the largest oil spillage in the world history of mankind (Roberton, Campbell, Krauss, Clifford, 2nd August 2010). Some other major spillage that were recorded in the coastal zone of the Niger Delta

are the Texaco Funiwa – 5 blowouts in the 1980 of which there was an estimate of 400,000 barrels oil spill, the GOCON's Escravos spill in 1978 of estimate of 300,000 barrels oil spill and the SPDC's Forcados Terminal tank failures in 1978 of estimate of 580,000 barrels of oil spill. Though there are some other oil spillage which include Jesse fire incident that claimed a lot of lives, the Abudu oil spillage which happened as a result of the pipeline in 1982 of about 18,818 barrels, the Idoho oil spill of January 1998 of an estimate 40,000 barrels of oil spill, also the fire incident of Maami which claimed a lot properties and rendering many homeless. Nigeria most publicized oil spill was the oil that occur in the year 1980 where a total of 37.0 million liters of crude oil spilled into the environment, the spill was as a result of the blow out of the Funwa 5 off shore station. Though the Nigeria largest spill was an off shore which was blow out in January 1980 with an estimated 200,000 barrels of oil a money worth of 8.4 million gallons spilled into the Atlantic Ocean from an oil industry facility which lead to the damage of 34o hectares of mangrove (Badejo, O.T and Nwilo, P.C., 2008). With the damage caused by oil spillage, the world at large has taken to some preventive measures in order to respond, regulate and manage oil spillage especially in the oil producing nations like Nigeria with much dedication to the Niger Delta region.

The prevention and management of environmental spillage in Nigeria has been inadequate after many year of oil exploration. The effect of oil spillage arising from inadequate measures employed as led to damage of both arable land and the people living in such land, it has also brought about a torn in the flesh of Nigeria's economy

especially in the development of the Niger Delta region. Due to this effect the Nigeria government has to enact some statues in order for them to curb such environmental problems, the government thought with an inadequate measure has also result to monetary compensation so as to reduce the hardship facing these people of these region as most of their major source of livelihood has been destroy, but even with the monetary compensation it is still not enough because their land and source of livelihood cannot be replaced.

1.2 Statement of Problem

Oil spillage has a negative impact on the people's environment as well as their livelihood leading to economic degrading of such people living there, which in turn affect the general economy of the Nation at large especially Nigeria been really depended on it. The effect of oil spillage has caused a lot of environment pollution. These pollution bring about environmental pollution which in turn bring about environmental problem which includes; the destruction of the flora, the risk of aquatic life, water contamination, destruction of lands, properties, resort and loss of life(Ibid).

Oil spillage brings about migration of people even though these emigrations are unwanted and unplanned by the people, but due to oil spillage there is a need for them to relocate from one locality or a country.

Oil spillage can lead to a total breakdown of a country economically, politically and even otherwise, according to Nwilo and Badejo(2005), "the consequence is far-

reaching as it impact negatively on the economy of a region, pollute water, thereby affecting the health of the local community and contaminates soil rendering it useless for farming and the reputation of the company involved". These are some of the environment issues as a result of the pollution caused by oil spillage in the Niger Delta region and there could be more if not properly curtailed and managed. To manage and curtail these problems is to first identify the causes and factors respond, check the economy breakthrough that will be born out from proper management of oil in these environment also there should be laws set in place to protect these environment and government should organize a suitable way to curb the disorders of oil spillage.

1.3 Research Questions

1. What are the causes of oil spillage in the Niger Delta region in Nigeria?
2. What are the environmental pollutions caused by oil spillage in the Niger Delta region?
3. What are the economic problems of oil spillage in Niger Delta?
4. Is there a way forward to Niger Delta oil spillage environmental pollution?

Working on this research study will help reveal various environmental pollution of oil spillage and also give a better solution and way forward to manage and control the oil spillage in the Niger Delta region and Nigeria at large to reduce or erases this environmental pollution for a better living for the Niger Delta economy.

1.4 Hypotheses

1. Oil spillage has no effect on the Niger Delta economy.
2. Oil spillage does not cause environment pollution to the Niger Delta region.
3. There is no effect of oil spillage in the lives of the Niger Delta habitants.

1.5 Aim and Objectives

The aim of this research is to investigate the causes and effect of oil spillage in the Niger Delta region of Nigeria and also the environmental pollution that is caused by this oil spillage also how this pollution affect the economy and habitants of Niger Delta .the research work will aim at the means of management and control so as to reduce the pollution cause by oil spillage.

To attain the above aim and objectives, the following will be considered during this research;

1. A review of literature that is pertaining to the study.
2. The benefit of crude oil to the Niger Delta economy as well that of Nigeria economy.
3. The cause and effect of oil spillage.
4. Identifying the main factors affecting the effectiveness of management systems to reduce oil spillage in the Niger Delta region
5. To proffer suitable management system which will improve the management of oil spillage in the Niger Delta region.

1.6 Significance of Study

This project looks into the oil spillage environmental pollution and the Niger Delta economy. This project has an important role to play with regards to prevention, response and management of oil spillage during the activities of oil production in the Niger Delta region of Nigeria. It will also give us a look into the aspect of the environment that oil spillage has had a negative effect on and how to go about fixing it and making it better.

This research will also view the cause of oil spillage, the environmental pollution that is caused by oil spillage, give a recommended solution for the improvement of the oil spills in Niger Delta region of Nigeria, in order to reduce and where possible prevent the occurrence of oil spillage in the region and also the environment pollution.

This research is necessary because it will serve as a good reference material for future research and even to Nigeria government, environmental management agencies, and also with great regard to the Niger Delta economy and environment.

1.7 Scope of Study

This study focus on the oil spillage in the Niger Delta region of Nigeria as well as its environmental pollution on the Niger Delta economy, which could be view aspect of Agriculture(land pollution), water pollution, health and air pollution, the causes and impact of oil spillage in the region.

The Niger Delta of Nigeria is the source of over 90 percent of crude oil, which is the present solid foundation of the Nigeria economy as it contribute greatly to it GDP, oil account for over 90 per cent of Nigeria's export earnings and about 80 per cent of government revenue.

The Niger Delta is located on the Atlantic coast of southern Nigeria, it is recorded as the second largest Delta in the world with coastline spanning about 450 kilometers and it has being described as the largest wetland in Africa and among the three largest in the world(NDSE, 1997). More than four decade of oil exploration and production activities have indeed left the Niger Delta environment with several degrades, all this happens through uncontrolled discharge of oil and its by-products including the chemicals which are used for these activities as well as the waste from these activities.

About 2,370 square kilometer of the Niger Delta are consist of rivers, creeks and estuaries with stagnant swap covering about 1900 sq.km. This is the largest mangrove in Africa; the region also falls within the tropical rain forest zone. The ecosystem of the Niger Delta is highly diverse and supportive of numerous species of terrestrial aquatic flora and fauna in addition to human life. This region cut across nine states of the southern Nigeria, these states includes Bayelsa, Abia, Cross-River, Akwa-Ibom, Delta, Edo, Rivers, Ondo states. The region has emerge as on most ecologically sensitive regions in Nigeria.

In addition to the abundant flora and fauna, arable land which can support a large variety of crops, forest or agricultural trees, and more species of fish than other ecosystem in western Africa, the Niger Delta, an ecosystem which is extraordinary well supported , includes one of the highest concentrations of biological diversity worldwide. It is regrettable to note, as a result of extensive dam during building in the area, that the area has estimated that it could 40% of if inhabitable land in the next years. This research is from the year 1992-2021.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

Crude oil though being and still is the major source of revenue for the Nigeria Economy, it spillage can be said to have also brought harm to the environment in which it has been discovered and it is being exploit, the Niger Delta part of Nigeria has face so many effect, their agricultural life, their health, their social life, habitation and others affected area of the Economy and all effect of oil spillage in this region goes far in affecting the Nigeria GDP, this chapter gives us an in depth of crude oil and it play and association of the Niger Delta economy of Nigeria.

For a topic of this interest, there have being so many works that have been done on this topic, be it journals, articles and even textbooks, these other written works will serve as guide on some aspects. So we will take a look at some of these works as I move nicely into the work at hand. The issues of oil spillage in the Niger Delta is not a new born issue, it has been in existence since the discovery of crude oil in 1958, to that note, our discussion will be collective of some of those works.

Ojimba (2012) in his work, “Determining the Effects of Crude Oil Pollution on Crop Production Using Stochastic Translog Production Function in River State Nigeria”, estimated the effect of oil pollution on crop production in Rivers State, Nigeria on a sample of 296 respondents drawn from 17 out of 23 local government areas, applied a

stochastic trans-log production function in a multi-stage sampling technique. The result indicate that the effect of crude oil pollution on the crop farms reduced the size of farmland, significantly at 1%, reducing marginal physical product(MPP)) , while in non-polluted farms output increased. Physical input, crude oil pollution variables and their interactions show strong negative (diminishing) returns to scale in oil polluted farms, but in the non-polluted farmland result indicate strong positive returns to scale. The technical efficiency results shows that less than 22% of crop farmers were 80% efficient in their use of resources in oil polluted farmland, while technical efficiency in non-polluted farmland indicates a high efficiency of 33%. This result indicates that environmental degradation poses a serious threat to farmer by diminishing both physical ability and psychological ability to farm. The goal of farming maybe defeated before the proper exercise, especially when the individual has no hope of compensation when the crops are destroyed, or the water polluted, as always, the case in the Niger Delta region.

Atubi, Ogbija and Ojeh (2015) in their work, “Effect of Environmental Degradation on Human Health in Selected Oil Communities in Delta State”, examined the effect of environmental degradation of human health in nine selected communities in Delta State, Nigeria, using cluster and principal analysis, observed that gas flaring has statistical significance, but dangerous impact on human health in the affected areas giving the high temperature and emission to the atmosphere. Nonetheless, the problem

of illegal bunkering and vandalizing petroleum pipeline contribute immensely to oil spillage and degradation of the environment.

Kadafa's (2012) "Environmental Impacts of Oil Exploration and Exploitation in the Niger Delta of Nigeria," examines the environmental impact of oil exploration and exploitation in Niger Delta of Nigeria using tabular analysis of data obtained from secondary sources. The study finds that the oil industry sited within the region has contributed enormously to the economic growth of the country, but unsustainable oil exploration activities have rendered the Niger Delta region one of the five most severely damaged ecosystem in the world.

2.1 Background to Crude Oil

According to Cambridge Energy Research Association (CERA) (2006), crude oil also referred to as oil is the term for "unprocessed" oil that can be found in porous rock formation in the upper strata of some areas of the earth crust. It is also found in semi-solid form mixed with sand and water. Crude oil is a fossil fuel, a natural resource from decaying plants and animals over millions of years ago (in most crude oil can be found along sea beds). Crude oil varies in color, it could go from clear to tar-black, and in velocity, from water to almost solid (Oil Sand-Glossary, 2007). Oil is of great important to the world at large, the important of oil in the world economy evolved slowly, oil has become the world most important source of energy since the mid-1950s. This is as a result of it abundance, high energy density and easy transportability

to different areas. Generally, oil is vital to industries and it accounts for a large percentage of the world's energy consumption (CERA, 2006). The world at large consumes 30 billion barrels (4.8km) of oil per year and top oil consumers largely consist of developed nations. This makes it one of the world most important commodities (International Energy Annual, 2004).

The chemical structure of crude oil is heterogeneous, composed of hydrocarbon chains of different lengths. Because of this, it may be taken to the refineries and the hydrocarbon chemical separated by distillation and treated by other chemical processes, to be used for variety of purposes. The total cost plant is about 9 billion dollars.

Crude oil has mostly been recovered by drilling due to the fact that natural petroleum springs are rare). Drilling is carried out after studies of structural geology (at the reservoir scale), sedimentary basin analysis, and reservoir structures) have been completed (Guerriero et al., 2012).

Crude oil is sent to the refinery after it is removed from the ground, and at the refinery, different part of the crude oil are separated into useable petroleum products. The petroleum industry is responsible for 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 product of crude oil include Liquefied Petroleum Gases

(LPQ), heavy fuel oil, diesel, gasoline, etc. (Simanzhenkov, Vasily; Idem, Rapheal 2003).

2.1.1 Brief History of Oil and Gas Industry

The history of oil exploration in Nigeria dates back to 1903 when Nigeria Bitumen corporation conducted exploratory work in the country, at the onset of world war 1 the firm's operation was stopped. Due to the lack of financial and technological resources by small oil company, large oil companies took over the exploration of commercial oil in the country. Thereafter, license was given to D'Arcy Exploration Company and Whitehall petroleum but neither company found oil of commercial values in the country and as such they returned their license in 1923. A new license was covering 920,000 square kilometers (357,000 squares miles) was given to Shell D'Arcy Petroleum Development Company of Nigeria, a consortium of Shell and British Petroleum(then known as Anglo-Iranian). The company of Nigeria began exploratory work in 1937. The consortium was granted license to explore oil all over the territory of Nigeria but the acreage allotted to the company in the original license was reduced in 1951 and 1957.

In 1956, Shell British Petroleum (now Royal Dutch Shell) discovered crude oil at Oloibiri, a village in the Niger Delta and commercial production began in 1958. Today, there are 606 oil fields in Niger Delta, of which, 360 are on-shore and 246 are off-shore (Nigeria Country Analysis Brief, 2005). Nigeria is the highest oil producer

in Africa and the sixth largest in the world, averaging 2.7 million barrels per day (bbl\d) in 2006, Nigeria's economy is heavily dependent on earning from oil sector, which provides 20% of GDP, 95% of foreign exchange earnings, and about 65% of budgetary revenue (Frynas J.G.1999).

2.1.2 Crude Oil and Nigeria Economy

Industrialization has brought about a great development in the human environment worldwide. In Nigeria economy, the oil industry has remained the leading sector for many decades now. According to EIA (2009), the Nigeria economy is heavy dependent on the oil sector, which accounts for over 95 percent of export earnings and about 85 percent of government revenues. The oil sector is located in the Niger Delta region of the country. In addition, Nigeria had an estimated 36.2 billion barrels of proven oil reserves as of January 2009. In 2008, crude oil production in Nigeria reached a mark of about 1.94 million barrels per day (bb1/d), making it the largest crude oil producer in Africa. And also being an important oil supplier to most developed countries. Over half of the country's oil production is exported to the United States. In 2008, Nigeria export about 2.17 million bb1/d of oil production of this, 990,000bb1/d (44%)) was exported to the United States, making Nigeria the fifth largest foreign oil supplier to the supplier to United States. The major foreign producers in Nigeria are shell, Chevron, ExxonMobil, Total and Eni/Agip (Experts column, 2010).

Nigeria being a nation that is endowed greatly natural resources and her weather supports years around agricultural production. Before the discovery of crude oil, Nigeria was greatly depend on the industrial and manufacturing sectors, as well as agricultural production and export of cash crops like; cocoa, groundnut, millets, maize and palm oil, which as a positive growth rate for its income, until the discovery of oil in Nigeria. Though, the activities of this oil exploration are not without some undesirable spin offs on the environment such as oil spills. This is the case in the Niger Delta region of Nigeria where majority of the crude oil exploration activities are conducted.

2.1.3 Companies Involves in Oil Exploration in Nigeria

All petroleum production and exploration is taken boding of joint ventures between foreign multi-national corporations and the Nigerian federal government. This joint venture manifests itself as the Nigerian National Petroleum Corporation, a nationalized state corporation. All companies obey government operational rules and naming conventions (companies operating in Nigeria must legally be sub entities of the main corporation, often incorporating “Nigeria” into its name). Joint ventures account for approximately 95% of all crude oil output, while local independent companies operating in marginal fields account for the remaining 5%. Additionally, the Nigeria constitution state that all minerals, oil, and gas legally belong to the federal

Government. Six companies are operating in Nigeria and are listed with their countries of origin (Suinyuy, 2008). We will take a brief look into some of these six companies;

Royal Dutch Shell (British/Dutch)

Shell Petroleum Development Company of Nigeria Limited (SPDC), which is simple known as Royal Dutch Shell: a joint venture operated by Shell accounts for 50% of Nigerian's total oil production (899,000 bb1/d (142,900m3/d) in 1997) from more than 80 oil fields. The joint venture is composed of NNPC (55%), Shell (30%), TotalFinnaEIf (10%) and Agip (10%) and operates largely on onshore on dry land or in mangrove swamp in Niger Delta. "The company has more than 100 producing oil fields, and a network of more than 6,00 kilometers of pipelines, flowing through 87 stations. SPDC operates 2 coastal terminals" (ibid). About 50% of the Nigeria crude oil is produced by Shell joint venture. The shell Nigeria has four companies and as well as a major stakeholder in the Nigeria Liquefied Natural Gas (NLNG).

Chevron (American)

Chevron Nigeria Limited (NLC): A joint venture of NNPC (60%) and Chevron (40%) has in the past being the second largest producer (approximately 400,000 bbI/d (64,000 m3/d)), with fields located in the Warri region west of the Niger Delta and offshore in shallow water. It is reported to aim to increase production to 600,000 bbI/d (95,000 m3/d) (Suinyuy, 2008).

Agip (Italian)

Nigerian Agip Oil Company Limited (NAOC): A joint venture operate by the Agip and owned by NNPC (60%), Agip (20%) and ConocoPhillips (20%) produces 150,000bbI/d (24,000m3/d) mostly from small onshore fields (Suinyuy, 2008).

Total (French)

Petroleum Total Nigeria Limited (TPNL): A joint venture between NNPC (60%) and EIf (now Total) produced approximately 125,000 bbI/d (19,900m3/d) during 1997, both on and offshore. EIf and Mobil are in dispute over operational control of an offshore field with a production capacity of 90,000bbI/d (14,00m5/d) (Suinyuy, 2008).

Texaco (now merged with Chevron)

NNPC Texaco-Chevron Joint Venture (formerly Texaco Overseas Petroleum Company of Nigeria Unlimited): A joint venture operated by Texaco and owned by NNPC (60%), Texaco (20%) and Chevron (20%) currently produces about 60,000bbI/d (9,500 m3/d) from five offshore field (Suinyuy, 2008).

Exxon-Mobil (American)

Mobil Producing Nigeria Unlimited (MPNU): A joint venture between the NNPC (60%) and Exxon-Mobil (40%) operates in shallow water off Akwa Ibom state in the south-eastern Delta and averaged production of 632,000bbI/d (100,500 m3/d) in 1997, making it the second largest producer, as against 543,000 pbd in 1996.

2.2 Oil Spill/Pollution

2.2.1 Definition of Oil Spill and Oil Theft

According to Wikipedia, oil pollution is the release of liquid petroleum hydrocarbon into the environment caused by human activity (Wikipedia, oil spills). It is the accidental release of oil into a body of water, from a tanker, offshore drilling or underwater pipeline which is a hazard to marine life and environment often referred to as marine oil spill (Dictionary.Com). These oil spills may spread to land and affect land animals and lives as well.

It is also defined as the presence of significantly large amount or layer of crude or redefined oil on soil or sea water (Business Dictionary).

Oil spill is a form of environmental pollution. The term oil spill is commonly use in marine oil spills where crude oil, redefined petroleum products or by product, ships' bunkers, oily refuse or oil mixed is released into the coastal water. The cost of cleaning this oil spill is on a high side as such it is likely to take a long time to clean up the spills. Marine oil spills make occur due to some reasons, which are;

1. Carelessness or mistake on the part of oil tanker owner.
2. Breaking down of equipment in the tanker/vessel.
3. Hostile acts. When two nations are at war, one may decide to drop gallons of oil into the other nation's oceans.
4. Intentional oil spills as an act of terrorism.

5. Oil release into the environment from the natural geological seeps on the sea floor.
6. Natural disaster such as hurricanes.

The effect of oil spills are devastating to put lightly. The problem of oil spills in the Niger Delta is that when these oil spills occur, it happens close to shore lines, this causes the oil to enter into land, this does not gives room for evaporation of dangerous element.

Crude oil theft on the other hand can be say to be any activity that is relating to stealing or sabotage of crude oil, facilities or installations in form of illegal bunkering, pipeline vandalism, fuel scooping and illegal refining and transport and oil terrorism. The most common known form of oil theft is illegal oil bunkering, this involve direct tapping of oil. Though oil bunkering is a necessity for maritime shipping within maritime sector, it becomes an illegal bunkering when it is carried out without requisite statutory licenses or valid documents, or in violation of the Nigeria maritime sector and the guidelines made by the statutory institutions regarding it (oil Theft and Sabotage 2019). Nigeria currently discovered that there were some many other pipelines link to their major pipeline, that is to say that oil theft has at 2022 has also become rampant and the government has a late discovery of it, even with the recent oil theft that was discovered, those pipelines could not be trace to any particular individual.

The Nigeria maritime sector has a regulatory system in charge of given requisite statutory license, valid document and a guideline made by the statutory institution, this institution is the Intentional Third Party Damage (ITPD). The practice of ITPD includes the integrity management system, requires operator attention to the potential for Third Party Damage (TPD). But in our case here, that of Niger Delta ITPD – sabotage and illegal bunkering- is a legitimate concern, and should be considered a high priority in pipeline integrity management programs. Sabotage and theft is a problem for oil pipeline operators in several regions around the world, notably Mexico, Columbia, the Middle East, Asia, and Africa.

According to Shell annual report on oil sabotage, crude oil theft, sabotage and illegal refining are the main source of pollution in Niger Delta today. In 2013 the Nigeria government estimated crude oil theft and associated deferred production at over 300,000 barrels of oil per day (BOPD). Intentional third-party interference with pipeline and other infrastructure was responsible for around 75% of all oil spill incidents and of all oil spill incidents and 92% of all oil spill from facilities operated by Shell petroleum development company (SPDC) over the last five years (2009-2013). In 2013 the number of spills from SPDC operations caused by sabotage and theft increased to 157, compared to 137 in 2012, whilst production losses due to crude oil theft, sabotage and related temporary shut-down increased by around 75%. On an average around 32,000 bpd was stolen from SPDC pipelines and other facilities, whilst the joint venture lost production around 174,000bopd due to shut down related to theft

and other third party interference. This equated to several billion dollars losses for the Nigerian government and the joint venture. Operation spills (those caused by corrosion, equipment failures or human error) accounted for about 15% of the total volume of oil spilled from SPDC facilities in 2013, the number of operational spill was over 100kg was 30,down from 36 in 2012 and 63 in 2011. However, the volume of oil spilled due to operational causes increased to 0.4 thousand tones. Around 0.3 thousand tones of this volume was from a single spill. Since 1995 SPDC has publicly oil spill statistics annually and at 2012 it operated on an oil spills data website which publishes data on all spill from SPDC JV facilities and provides weekly progress updates, investigation report and photographs. SPDC is the only oil and gas company in Nigeria that publishes spills data in this way.

2.2.2 The Extent of Oil Pollution in Nigeria

Majority of oil spills that occur are due to pipeline and tanker accidents (50%), while the other causes include sabotage (28%) and oil production operation (21%), with 1% of the spills accounted for by inadequate or non-functional production equipment. Due to improper management in terms of inspection and maintenance of some pipeline and tankers, it further leads to corrosion of these pipelines and tankers, this is as a result or leaking of old. Pipeline has an estimated life span of 15 years and when these pipelines extend this year without maintenance, it becomes old and become open to corrosion. Oil sabotage is primarily carried out through “bunkering”, whereby the

saboteur attempts to tap the pipeline. During the process of extraction sometimes the pipeline is damaged or destroyed, this oil that is extracted through this process are often been sold. Oil theft and sabotage has become a major issue in the Niger Delta and this further contributes to environmental damage. Damage lines may go unnoticed for days and repair of the damaged pipes take even longer. Oil siphoning has indeed become a big business, with the stolen oil quickly making it way into the black market. Other discharge from near shore operations, urban and industrial effluents discharge, Ballest water from oil tankers, Accidental spills during loading and Equipment failure at loading site.

Report on the extent of oil spills varies. The Department of Petroleum Resources estimated 1.89 million barrels of petroleum were spilled into the Niger Delta between 1976 and 1990 out of a total of 2.4 million barrels spilled in 4,835 incidents (Approximately 220 thousand cubic meters). A UNDP report states that a total of 6,817 oil spills between 1976 and 2001, which account for a loss of three million barrels of oil, of which more than 70% was not recovered. 69% of the spill occurred off-shore, a quarter was in swamps and 6% spilled on land. Some spills are caused by sabotage and thieves, however most are due to poor maintenance by oil companies such as shell.

Though oil spill is a global concern, due to the fact of how life are been affected by it but from finding it is only looked at in the developed nations, like that of Exxon

Valdez spill (260,000 barrels) of 1989 which has highly reference, this occurred in the United State. Whereas there have been several oil spill that has occurred in the Niger Delta which are even greater than that of Exxon but this oil spill is a case that has been swept under the carpet. Some pointed case of oil spills in Niger Delta includes; GOCON Escravos spill of 1978 (300,00 barrels), Forcados Terminal tank failure of 1978 (580,000 barrels) and the Texaco Funiwa 5 blowout of 1980 (400,000 barrels) but with untold devastation and destruction to plants, fisheries, birds and even the ultimately livelihood of the people, yet no serious attention was paid to their impacts till date.

2.3 Impact of Oil Spillage

Oil spillage has a great impact on the areas where it does occur; we will take a look on these areas.

Environmental Impact of Oil Spillage

oil spillage has in it own way of affecting the environment, this leads to damage of environment resources like; loss of mangrove, depletion of fish population, water hyacinth invasion and soil contamination.

Oil spill in rural communities such as Niger Delta region can have serious effects on the lives of residents in that community. Oil spill ultimately affect land fertility, thereby agriculture in a variety of ways (Worgu S.O 2000). Oil spill contamination of

the top soil has tendered the soil in the surrounding areas unsuitable for plant growth by reducing the availability of nutrients or by increasing toxic contents in the soil. Apart from soil infertility, the oil spills have also smothered economic trees and food crops, out rightly killing them or reducing their yield (Worgu, 2000). This has caused a reduction in the household food security. The predominant occupation of the people in the Niger Delta includes; trading (17%), education and health (7%), agricultural and fishing (48%), services (10%) (Badejo & Nwilo).

In case of water hyacinth invasion which is an invasive species that was introduced into Africa, an ornamental plant, and it grows vigorously in polluting the environment. Water hyacinth has the capacity to completely close the waterways in which it grows, making it nearly impossible to navigate fishing boats. In recent year it has found it ways into the Niger River, choking out both sunlight and oxygen to the marine organisms that lives there. With this distortion that is being cause by the water hyacinth, a lot of marine organism will be loss and the livelihood that depends on those marine organisms will be scattered.

Also in the aspect where the community residents rely on farming, most farmers are likely to migrate to more fertile lands in other communities, putting pressure on scarce fertile lands. While some of the displaced farmers out-migrate to urban areas in search for means of livelihood. Hassan et al (2002) added that in farming communities that most severe problem of such communities are poor quality soils and other serious

problems related to their farming operations which are found to be lack of inputs, insufficient capital and inadequate extension services. As such, if the community should experience oil spills with the already existing problems to farming, the situation becomes even worst.

When various harmful and toxic compounds are introduced into the natural environment as result of oil spill, it changes the geo-chemical position of the soil, river and other components of the environment leading to deforestation and erosion of the top soil. This in turn affects agriculture, leading to a drastic decline in output in fishing and farming activities.

It was identified from conducting interviews on spill in several communities in developing nations that farmland pollution was a major problem. The peasants were very reactive to farmland pollution because of the unavailability of modern farming techniques to meet the challenges of declining soil resources. Additionally, the drastic fall of agricultural output means they cannot meet their needs, leading to the intensive exploration of other fertile land. The long run effect of the oil spill is land degradation and out-migration of other rural and urban areas, where pressure is exerted on the often inadequate and dilapidated infrastructure, leading to increased poverty and penury as more displaced inhabitants move to other particular areas in search of non-existent jobs (Stanley, 1990).

Social-Economic Impact

Apart from loss of farms, oil can seriously affect the socio-economic state of locality (Gbadegesain .A 1997). He highlighted that the main socio-economic impact of oil spill commences from farmers and fishers but extends to affect society at large. ITOPE (2009), stated that oil spill pollution of land and water leads to interference and loss of recreational such as diving and sporting events. These are some little activities through which revenue can be generated in that locality. Businesses that make use of the rivers and sea for their normal operations can also be adversely affected by oil spill.

Another affected aspect of social-economic life by oil spill is the loss of tourism such as polluted beach and reserves. This leads to decreased resident and non-resident vacation/pleasures visitors in the spill affected areas in turn affecting businesses such as restaurants, hotels or charter boats. Oil spill impacts disastrously on the socio-physical environment as it threatens the fragile subsistent peasant economy and biodiversity and hence the social livelihood and very survival of the people. ITOPE further buttressed that oil-producing communities along coastal areas basically depend on this businesses as a means of survival. Hence, the deteriorating standard of living , some of which includes lack of clean water, social amenities and loss of jobs results to chaos in the locality (Owabukeruyele, 2009), this is because numerous oil spill have devastated some of the businesses of community members, which is their main source

of income. Without better alternative these people are left with no other option than drinking contaminated water and living in a polluted environment. For this reason the oil producing community members conducts protest, demanding for compensation from the oil companies located in and around their communities and if not managed properly results to insecurity in the area (Stepping Stone Nigeria, 2009).

Health

Crude oil as we know is toxic substance, this toxic substance is harmful to the flora and the fauna, and when there is oil spill it contaminates the environment, it affect the health and general living condition of the affected locality. Evidence of health situations of communities that experienced oil spillage has been attributed to the direct consequences of the oil, some of the health problems arise from both environmental negative impacts such as pollution of water sources upon which communities depend. Also there is water pollution which exposes the locality inhabitants to water borne related diseases such as; typhoid and malaria with the creation of standing waters, diarrhea and other skin diseases. For example, in some communities, the pipeline traverses the village stream, which serves as water source for the inhabitants. When oil spill occurs, the communities and even the company workers get exposed to it through inhalation, dermal or direct impact. People may be dermally exposed to both volatile and non-volatile components, which some of it are capable of being absorbed through the skin thereby causing skin irritation or dermatitis. While that of inhalation exposure

is volatile chemicals, of which the main classes are alkanes, aromatics and sulphur compounds (Park J.M and Holiday, M.G. 1999). The health effect of crude oil include the overt signs of acute intoxication in humans- dizziness, nausea, shortness of breath, headaches, fatigue in coordination, as well as irritation of the eyes. It has also been found that prolonged exposure to high doses of these compounds leads to high doses of these compounds leads to irreversible bone marrow damage causing aplastic anaemia and leukemic diseases (Park J.M and Holidays, M.G. 1999).

2.4 Causes of Oil Pollution

Based on research finding, we can comfortably say that there are 7 basic cause of oil and other unknown in the Niger Delta, these causes are; sabotage, corrosion, operation and management error, blowout, equipment, nature, accident and unknown.

(a) Sabotage

Sabotage can be define as any underhand interference with production, work, etc, in plant, factory, etc, as by enemy agents during wartime or by employees during a trade dispute.

According to shell's annual report on oil sabotage (Professor Richard Steiner), crude oil theft, sabotage and illegal refining are the main source of pollution in the Niger Delta today. In 2013 the Nigeria government estimated crude oil theft and associated deferred production at over 300,000 barrels of oil per day (BOPD). Intentional third

party interference with pipeline was responsible for around 75% of all oil spill incidents and 92% of all oil volume spilled from facilities operated by the Shell Petroleum Development Company (SPDC) over the last five years (2009-2013). Much greater volumes of oil are discharged into the environment away from SPDC facilities through illegal refining and transportation of stolen crude oil.

In 2013 the number of oil spills from SPDC operations caused by sabotage and theft increased to 157, compared to 137 in 2012, whilst production losses due to crude oil theft, sabotage and related temporary shut downs increased by around 75%. On average around 32,000 BOPD were stolen from SPDC pipelines and other facilities, whilst the joint venture lost production of around 174,000 BOPD due to shutdowns related to theft and other third-party interference. This equate to several billion dollars in revenue losses for the Nigeria Government and the joint venture.

(b) **Corrosion**

Corrosion is a natural process that converts a refined metal into a more chemically-stable from such as Oxide, hydroxide, or sulfide. It is the gradual destruction of materials (usually metals) by chemical and/or electrochemical reaction with their environment. Corrosion engineering is the field dedicated to controlling and preventing corrosion.

According to EonCoat Manufacturing and Research Facility, corrosion is of decay on a material caused by chemical reaction with it environment. Corrosion of metal occurs when an exposed surface comes in contact with gas or liquid, and the process is accelerated by exposure to warm temperature acids and salts.

Corrosion is the destructive attack of a material by reaction with it environment (RobergePr). And a natural potential hazard associated with oil and gas production and transportation facilities (Kermani). Almost aqueous environment can promote corrosion, which occurs under numerous complex conditions in oil and gas production, processing and pipeline system (Champion Technology).

Crude oil and natural gas can carry various high-impurity products which are inherently corrosive. In the case of oil and gas wells and pipelines, such highly corrosive media are carbondioxide (CO2), hydrogen sulfide (H2S), and free water. Continual extraction of CO2 and H2S, and free water through oil and gas component can over time make the internal surface of these components to suffer from corrosion effects. The lines and the component fittings of the lines and component fittings of the lines would undergo material degradations with the varying conditions of the well due to changes in fluids compositions, souring of wells over the period, and changes in operating conditions of the pressures and temperatures. This material degradation results in the loss of mechanical properties like strength, ductility, impact strength and

so on. This leads to loss of materials, reduction in thickness and at times ultimate failure.

(c) **Operation and Management Error**

Sometimes the cause of oil spill can be as a result of the worker and officer involve in carrying out the oil exploration process. This is while it is important for the competency and qualification of the worker is necessary especially that of the engineers and operation managers, because their ignorance and negligence may cause oil spillage. The emphasis on employing and using competent workers cannot be underestimated as their action and inaction can cause oil disasters. Their errors are major causes of oil spillage.

(d) **Blowout**

A blowout is the uncontrolled release of crude oil and natural gas from an oil well or gas well after pressure control system has failed (Norwegian oil Review). Modern wells has blowout preventers intended to prevent such as occurrence. An accidental spark during a blowout can lead to a catastrophic oil or gas fire.

Prior to advent of pressure control equipment in the 1920s, the uncontrolled release of oil and gas from a well while drilling was common and was known as an gusher, gusher or wild well.

(e) **Equipment**

The types of equipments used in oil exploration also form a cause of oil pollution. For example where the equipments are substandard and faulty it could lead to oil spillage. Malfunctioning equipments and tools is a major cause of oil spill in Nigeria.

(f) **Nature**

Crude oil is formed during a long process of time through natural process involving organic matter from dead organisms. Thus, oil exists in many environments and maybe naturally spill due to various factors (including climatic conditions, disturbances, etc.). Such natural oil spills may occur in oceans, due to eroding of sedimentary rocks from the bottom of the ocean.

(g) **Accident**

Accidental spill may occur in various circumstances, most often during the following activities:

Storage

Handling

Transportation

Offshore drilling

Routine maintenance activities

Road runoff

2.5 Type of Pollution in the Niger Delta

The oil exploration in the Niger Delta has led to different type of pollution affecting the land. These pollutions form of degradation of Niger Delta. In this sub chapter we will examine the types of pollution that disturbs Niger Delta due to oil spills and their effects.

Land Pollution:

According to Akpotaire V. et al, Land pollution is degradation of land by man through harmful activities like the dumping of harmful chemicals waste materials on land that at dangerous to vegetation and agricultural production. Oil spill is the major cause of land pollution in the Niger Delta. Pollutant associated with petroleum chemical industry is material which contains a wide range of organic and inorganic contaminant such as oil grease and toxic metals, hydrogen sulphide and ammonia.

Water Pollution:

Water pollution is the introduction by man directly or indirectly of substance of energy into the marine environment resulting in such a disastrous effect that are harmful to the marine environment and marine activities like fishing and which may cause impairment of quality of use of water and reduction of amenities (Akpotaire et al., 2015). Water pollution is the major cause of pollution in the Niger Delta which usually drifts into water bodies, polluting the water and rending it unfit for human

consumption and fishing activities which are the major occupation of the people (Azaiki).

Air Pollution:

Air pollution is the contamination of the atmosphere by gases or solid, produced in the burning of natural fuel, chemical and some industrial process and in nuclear explosions. It may be considered to include contaminations produced by such processed as accumulation of cosmic dust, raising by wind of surface dust, eruption of volcanoes, decay of vegetations, evaporation of sea salt and natural radioactivity.

2.6 Effect of Oil Spillage in Niger Delta

Since the discovery of oil in 1950s, the country has been suffering the negative environmental consequence of oil development. The growth of the Nigeria's oil industry, combined with a population explosion and lack of environment regulations, led to damage to the environment of Nigeria, especially in the Niger Delta region, the centre of the country's oil industry.

Oil spill in Niger Delta has been a regular occurrence, and the resultant environmental degradation of the surrounding environment has caused significant tension between the people living in the region and multinational oil companies operating there. It is only in the past decade that environmental groups, the Nigeria federal government,

and the foreign oil companies that extract oil in the Niger Delta have begun to steps to mitigate the damage.

Although the situation is improving with more stringent environmental regulations for the oil industry, marine pollution is a serious problem.

The movement for the survival of Ogoni people (MOSOP) and other Ogoni activists has on several occasions called on the Nigeria federal government to regulate the oil exploration, drilling, and processing activities of Shell Oil and other oil companies in the oil producing regions of Nigeria. The Ogoni have received virtually none of the $30 billion from oil pumped out of their lands, and they have been actively demonstrating against such injustices. Mr. Saro-Wiwa, along with eight other MOSOP members, were arrest and charged with the murder of four traditional chief belonging to pro-government group in Ogoni region. The murder occurred during a bloody clash in May 1994 between Ogoni activist and the Federal government soldiers. On October 31, 1995, a federal military tribunal sentenced them to death. The death of the Ogoni activist led to the suspension of Nigeria from the commonwealth of Britain. International Finance Corporation cancelled a proposed $100 million loan and $80 million equity deal to Nigeria LNG, a company owned by the Nigerian Government and the top oil producers in Nigeria (Shell, EIf and Agip), to produce a gas plant and pipeline in the Niger Delta (TED case Studies, 1997).

In May 2006, an independent team of environmental expert from Nigeria, the UK, and the US conducted a preliminary Natural Resources Damage Assessment in the Niger Delta. This assessment with the participation of Nigeria's Ministry of Environment; the Nigeria conservation foundation; the IUCN commission on Environmental, Economic and social policy; and the following was found (IUCN/CEESP 2006), (Professor Steiner Richard Anchorage).

- The Niger Delta is one of the world's most severely petroleum-impacted ecosystems.
- Oil development occurred in the Delta without comprehensive, strategic plan, which would have protected its natural resources. Many of the oil facilities and operations are located within sensitive habitats – including areas vital to fish breeding, sea turtle nesting, mangroves and rainforest – that have often been severely damaged, contributing to increased biodiversity loss and poverty.
- The damage from oil and gas operations is chronic and cumulative, and has acted synergistically with other sources of environmental stress to result in a severely impaired coastal ecosystem and compromised livelihoods and health of the region's impoverished residents.
- In addition to spills, damage from oil and gas operations in this region has included extensive habitat degradation from road building, forest clearing,

dredging and filling; pollution from gas flaring and operational discharge, and increased population pressure from immigration to the region.

Rural communities in the Niger Delta have suffered most of the environmental and social cost of 50 years of oil development.

Oil companies operating in the Delta have not employed the Best Available Technology and practices that they use elsewhere in the world – a double standard. The oil companies can and should improve their environmental performance in the region.

The financial valuation of the environmental damage caused by 50 years of oil and gas activities in the region – taking into account the unique and productive character of the ecosystem as well as comparable valuations on other such ecosystem – is 10's of billions of US dollars.

The United Nation Environment Programme, states the following with regard to oil spill impacts in the Niger Delta (UNEP 2006).

'This is a major impact on the coastal environment particularly in the Niger Delta area where oil prospecting in extensive. Potential impacts of oil spills includes among others:

A) High mortality of aquatic animals.

B) Contaminations of human lathered.

C) Impairment of human health.

D) Loss of biodiversity inbreeding grounds.

E) Vegetation destruction and other ecological hazards.

F) Loss of portable and industrial water resources.

G) Reduction of fishing activation.

H) Poverty, rural underdevelopment and bitterness.'

2.6.1 Some Oil Spillage Record in the Niger Delta

- Shell 1978 spill caused by tank failure at Forcados Terminal in which 580,000 barrels were spewed.
- Texaco's Funima-5 offshore blowout in 1980 that released 400,000 barrels of oil.
- Mobil's spill at Idoho in 1998 with a reported release of 40,000 barrels of crude oil.
- The shell spill in 2008 at Ikot Ada Udoh where a capped well failed and spewed an unreported amount of crude oil for months before it was stopped.
- Agip oil spills at Kalaba, Bayelsa State raged for over two months starting from February 2009 before it was stopped. More spills occurred on the same pipeline in September 2012 and remained unchecked for a long stretch of time.
- Exxon oil spills at Ibeno, Akwa Ibom state in May and June 2010.
- Shell's Bonga Spill -40,000 barrels on December 2011

- Exxon Mobil spill at Ibeno -25km offshore – 9 November 2012. Mobil claimed only 200 barrels of crude oil were spilled in this incident, but the spread impacted a wide stretch of the coastlines raising suspicions over the veracity of the estimate.

Besides the oil spill and gas flares, millions of barrels of produced water and other toxic waters are daily dumped into the Niger Delta. Indeed up to 600,000 barrels of produced water are dumped into the environment on a daily basis in the Niger Delta. The type and quantities of dispersants utilized in fighting offshore spills such as those of Shell's Bonga incident, Chevron's rig explosion and ExxonMobil's Ibeno spill are not known. The toxicity and the inherent danger in the use of those chemicals cannot be gauged without a disclosure of the chemical used.

Sabotage is another major cause of oil spillage in the country. Some of the citizens of this country in collaboration with citizens from other countries engage in oil bunkering. They damage and destroy oil pipeline in their effort to steal them. SPDC claimed in 1996 that sabotage accounted for more than 60% of oil spills at its facilities in Nigeria, stating that the percentage has increased over the year both because of number of sabotage incidents has increased and because spills due to corrosion have decreased with programs to replace oil pipelines (SPDC,1996. Keen Deep in Crude).

2.7 Oil Spillage Incidence

With the many hearing of oil spillage in the Niger Delta region, here are but a few live incidence of oil spill in the lives of the people and bad it has brought the environment to.

In the year 2009, May 12th, an oil firestorm at Shell's Mainfold in Bomo Rivers state spilled massive volumes of oil that affected more than 39 hectares of land. "It kills our fish, destroy our skin, spoils our stream, we cannot drink…. I have no livelihood left," mused Saturday Piri (a palm wine tapper, who had depended on the trade for years till oil became an issue with the fruitfulness of the palm).

In December, 2011, Shell's oil platform, Bonga field, convulsed, injecting from the leaks more than 40,000 barrels of oil into the southern coast of Niger Delta (environmental news service 2012). The neighbouring beaches were filled with black bog which in turn affected fisheries. Nigeria's Oil Spill Detection and Response (NOSDRA), quickly called for suspension of fishing in the area. By 16 January 2012 natural gas rig at Apoi North field, off the coast of Bsyelsa State, belonging to chevron went up in flames for four weeks before serious attention was paid to it. A fuel tanker fire accident on 12 July 2012 roasted more than 200 people at Okogbe, River State. The oil tanker skewed off the road and fell after an unsuccessful attempt by the driver to dodge a bad spot on the road. From the poiny of seismic and exploration activities, through production, to transportation, the oil industry in Nigeria is noted for pollution

and calamity. “It makes water unsuitable for fishing and renders many hectares of land unusable. Brine from oil field contaminates water formations and streams, making them unfit as sources of drinking water,” notes OkechukwuIbeno.

The net result has been serial violations of social, environmental, economic and political rights of local people (Gabriel Eweje, 2006).

Ogoniland has provided us with some countless examples of how oil pollution impacts environments and local populations in oil producing countries in Africa. The United Nation Environmental Programme (UNEP) undertook an environmental assessment on Ogoniland. From the assessment, report shows as at August 4, 2011 remains a significant contribution to existing body of knowledge on oil pollution. The report covered groundwater, ‘land, surface water, vegetation, sediment, air pollution, public health, industry practice and institutional issues.’ It charge Shell Petroleum Development Company (SPDC) for massive pollution of land, sediments and swaps through regular oil spills and gas flaring in Ogoniland. Nineteen years after the company was compelled to withdraw its operations, oil spills have remained a regular feature of the oil infrastructure in Ogoniland.

UNEP scientists examined more than 4,000 samples, taken from different locations including those from 142 groundwater wells; drilled for that purpose (UNEP 2011). The report shows that the oil pollution in Ogoni land was severe and wild-ranging and this has lead to high concentration of the water on the soil and as well as that of the

ground water, this also result to the water not being good enough for drinking, because it now contain high level of Benzee which is 900 times more than the standard set by World Health Organization. And it is 1000 times above the standard set by the Nigeria government.

According to United Nations Under-Secretary-General and Executive Director of UNEP Achim Steiner 2011, the history of oil industry in Ogoni land is "not only long and complex; it is painful and pig-headed." We can therefore say that from the the report on the assessment from the UNEP that the problem face by the Ogoni land is similar to the problem that will be faced by other oil rich state in the Niger Delta. The scale of baseline information provided by UNEP's study cements knowledge and adds a quantitative dimension, which can be utilized by political and policy makers.

The sickening impact of oil pollution in the livelihood has yet to be fully appreciated. Apart from the fact that terminally sick and weak people cannot provide for their families, depletion of aquatic and terrestrial resources due to oil spills and gas flaring have had a huge impact on livelihood. Oil pollution remains a threat to healthy living and the economic survival of local populations. Communities lack good drinking water, health centres, schools and access roads. Beyond this, is the question of poverty? Oil pollution remains the biggest challenge to the economic survival of women and children. Fishing and farming which are the main occupations of the people has been made futile (Ovieteme George). Impact on vegetation, through

accidental fires alone is extensive. There are different estimates in the Niger Delta and it would not be far from the truth to say that these guess estimates do not match the scale of horrors.

2.8 Controls of Oil Spillage

The following ways are in which oil spillage can be control in the Niger Delta, according UNDP these control and management measure to prevent and respond to oil spill already exist in various countries including Nigeria. A few of the communal laws and universal understandings in place suggested by the Federal Environmental Protection Agency of Nigeria (FEPA) to help protect the environment particularly from activities resulting in pollution by oil companies include;

a. Endangered Species Decree Cap 108 LFN 1990.
b. Federal Environmental Protection Agency Act Cap 131 LFN 1990.
c. Harmful Waste Cap 165 LFN 1990.
d. Petroleum (Drilling and Production) Regulation 1969.
e. Mineral Oil (Safety) Regulation 1963.
f. International Convention on Establishment Fund for Compensation for Oil Pollution Damage, 1971.
g. Convention on Prevention of Marine Pollution Damage.
h. African Convention on the Convention of Nature and Natural resources 1968.

i. International Convention on the Establishment of an International Fund for the Compensation for Oil Pollution Damage, 1971.

j. Application of polluter pay principle.

To mention but a few, all these regulations was set in place to help maintain, manage and control oil pollution in the Niger Delta region.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter explains the methodologies that were use in gathering data and analysis which are relevant for this research. The methodology include the location in which the research was based, research design, type of data, data collection, data collection method and it management.

3.1 Research Design

The study uses the descriptive research design, it took out time to describe the characteristic and situation of the people in Niger Delta region and how oil spill has affected their environment as well as their lives.

3.2 Area of Study

This study was carried out in the Niger Delta region of Nigeria. The reason behind this location is that most or all oil exploration carried out in Nigeria is done in the Niger Delta region. Hence, the need to study and get relevant information on oil spillage, it environment pollution and how it has affect the Niger Delta economy.

3.3 Research Approach/ Strategy

According to Kombo (2006), there are two types of research approach which are the quantitative and the qualitative research approach, but from most recent finding there are three types of research approach which are the quantitative, qualitative, and the mixed research approach, for the cause of this study the quantitative approach was used.

3.4 Types and Sources of Data

For this research the secondary data was used; secondary data are normally data collected earlier for different uses (Saunder et al., 2003). In this case the secondary data was collected from different known statistic sources which are;

National Oil Spill Detection and Response Agency (NOSDRA)

Statistical bulletin of CBN

NNPC statistic data for oil spill

Shell oil spill annual statistics

3.5 Data Analysis

Data collected from different sources was processed and analyzed for discussion. Appropriate computer software was used to analyze data. The excel computer software was use to see the amount of oil spills, it environmental pollution and how in turn affect the Niger Delta Economy, this was further explained in trends and graphs.

Through the use of trends and graphs, the final pictures show how deep oil spill has destroyed most basic part of the Niger Delta Economy thus leading to fall in their economics product. In terms of health, livelihood, agriculture, economic lives as well as their social economic life.

CHAPTER FOUR

PRESENTATION OF DATA AND RESULT

4.0 Data Presentation

In this chapter we will into our data, which was presented in a tabular way using excel spread sheet, the data was further represented and analyze using a graph and trend.

Our data was source from National Oil Spill Detection and Response Agency (NOSDRA), with a time series data from 1992-2021.

Three presentations was looked into; the number of oil spill cases reported, the volume of oil spill per year which was capture in volume and the comparing between the number of cases reported and the volume of oil spill recorded.

The volume of oil spill in barrels was used to tell the rate of oil spill as regard environmental pollution.

4.1 The Number of Oil Spill Cases Reported

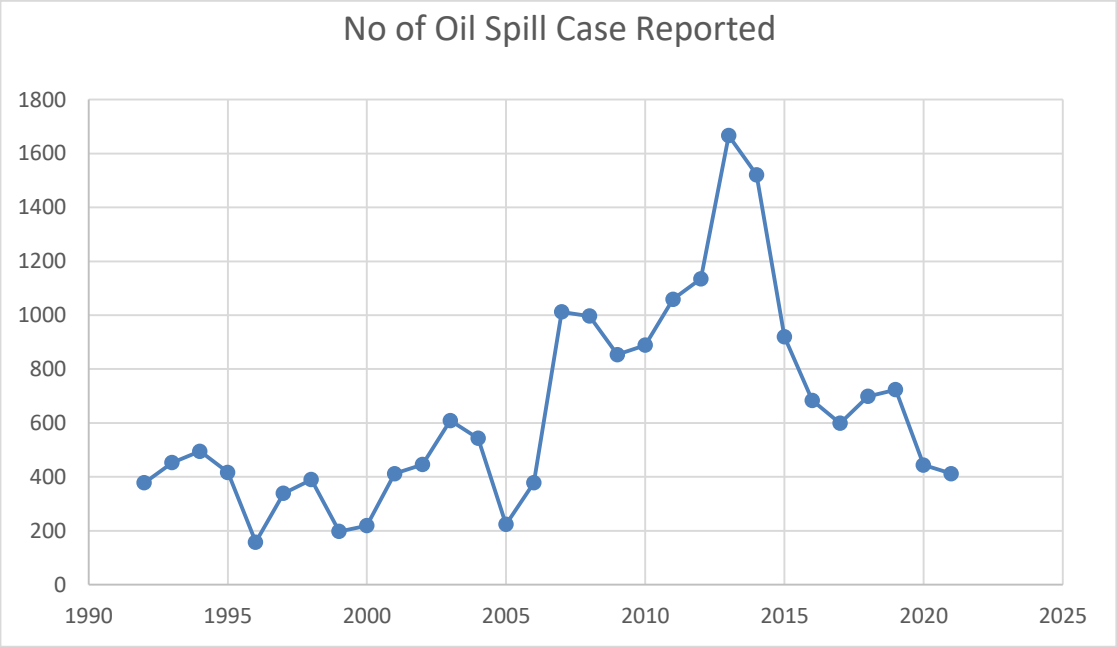
The data has shown below is represented in a graph trend and a bar chart.

Years	No of Oil Spill Case Reported
1992	378
1993	453
1994	495
1995	417

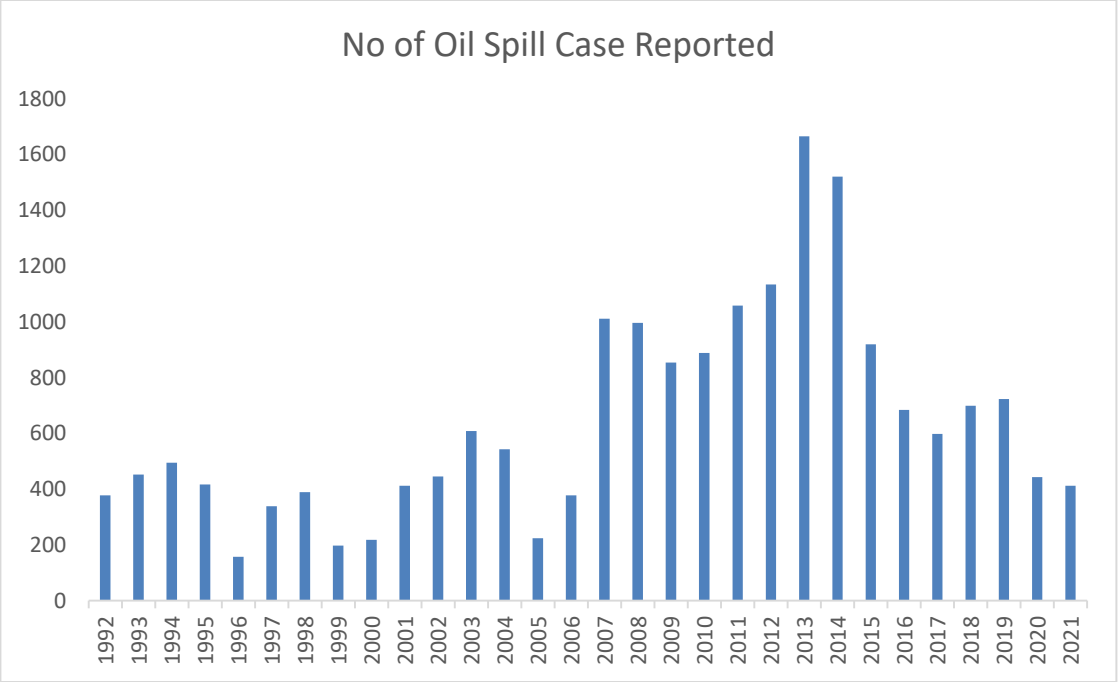
1996	158
1997	339
1998	390
1999	198
2000	219
2001	412
2002	446
2003	609
2004	543
2005	224
2006	378
2007	1012
2008	997
2009	854
2010	889
2011	1059
2012	1135
2013	1666
2014	1521
2015	920
2016	684
2017	599

2018	699
2019	724
2020	444
2021	412

Source: National Oil Spill Detection and Response Agency (NOSDRA), Nigeria.



Note: Graph drawn using Microsoft Excel.



Source: Graph constructed from Microsoft Excel.

From the graphs above shows a graph representing the number of oil spill cases reported versus the years they were reported.

Where the x axis of the graph shows the years the case was reported, the y axis shows the numbers of cases reported in the Niger Delta region.

The Blue line on the graph shows the trend at which different case was reported and the number reported.

From the graph we could see that oil spill case reported was high as at the year 2013 (1666 cases was reported) followed by 2014 (1521 cases), then 2011 (1059 cases) and lastly 2007 (1012 cases).

Let’s have a look at the lowest case that was reported, from our trend we can see that 1996 has the lowest report of oil spill.

Looking into the significant of this trend, we could see that at first when the oil spill case reported dropped in 1996 we could hope for further for less cases to help base our fact that as the cases reduced there was less effect on the environment but the year 20o7, 2011, 2013 and 2014 proved otherwise because cases report at those years was very high, it was at its peak in the year 2013.

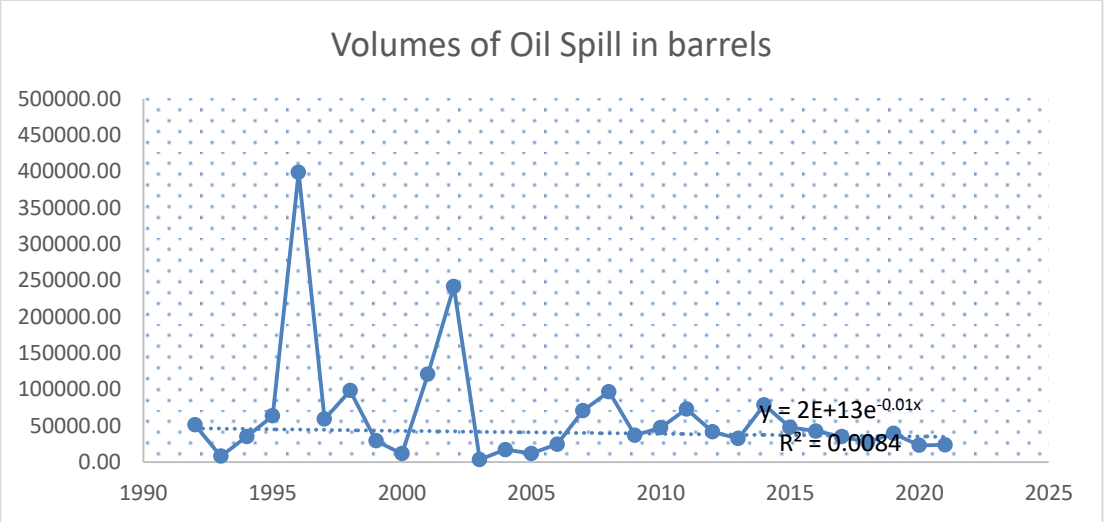
From the graph above we can say the reported case of oil spill is fluctuating and when cases reported are low we also hope that the volume of oil release into the environment are also low.

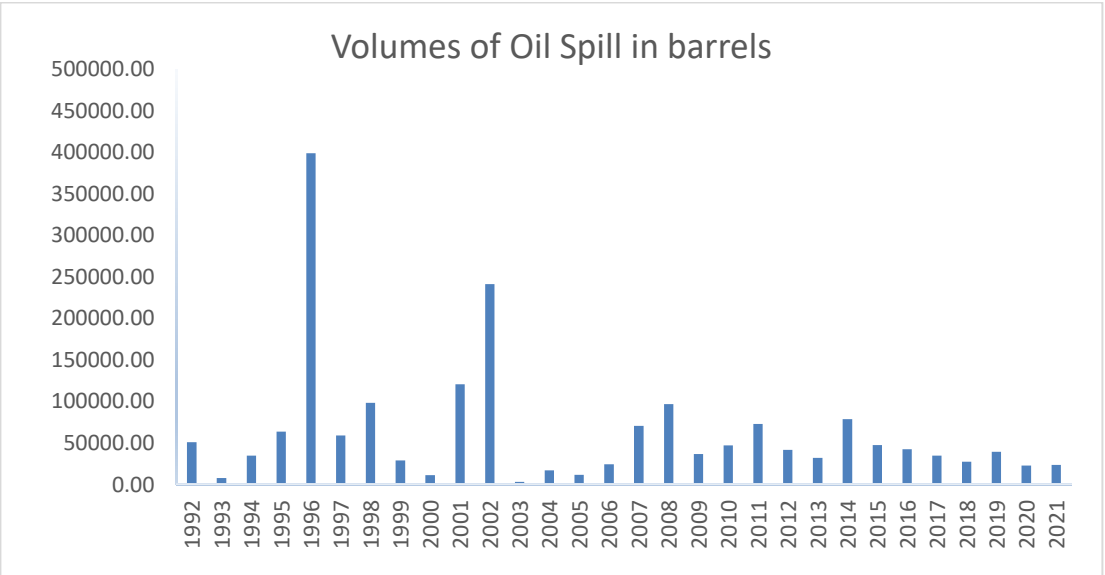
For a better clean up in theses affected area, I predict if more cases are looked into and a work is done to reduce those cases on a positive side then maybe the Niger Delta environment will be a safe one for life, plants and animals.

4.2 The Volume of Oil Spill in Barrels

Years	Volumes of Oil Spill in barrels
1992	51187.90
1993	8105.32
1994	35123.71
1995	63677.17
1996	399036.67
1997	59272.30
1998	98345.00
1999	29337.00
2000	11542.00
2001	120976.16
2002	241617.55
2003	3528.43
2004	17104.00
2005	11921.00
2006	24723.91
2007	70795.77
2008	96847.35
2009	36988.09
2010	47261.02
2011	73132.00
2012	41802.00
2013	32292.16
2014	78890.46
2015	47701.63
2016	42734.53
2017	35071.82
2018	27784.85
2019	39478.97
2020	23114.01
2021	23697.58

Source: National Oil Spill Detection and Response Agency (NOSDRA) Nigeria.





Note: Graph drawn with the use of Microsoft Excel.

From the graph above we can see that though the number of cases reported tells a different analysis from the volume of oil that was spill, because in some cases the number reported might be small and the volume large, we will dive more into this

when both graphs/trends of the number of cases reported is been compared to the volume of oil spill, for now lets discuss the graph/trend of volume of oil spill.

Like we did for the previous graph, this is a graph of years of occurrence versus the volume of oil spill in barrel, where the years is on the x axis and the volume of oil spill on the y axis.

This graph shows the volume that was lost to the environment per year, which was represented by the blue line showing its trend, this help to detect the amount of environment pollution caused by the oil exploration companies in the Niger Delta.

From the graph we can see that the volume of oil spill was at it peaks as at 1996 that was recorded as 399036.67 barrels, if we recall that the lowest number of case report from the previous graph was that of 1996, this implies that though the number of case reported may be low but the volume of oil spill that the number reported may be high.

Look further to our trend from the graph we can also see that our lowest was as 2003, our trend from the graph shows that, it was almost like there was no spill recorded because our line is almost close to the x-axis stating that, that was the lowest oil spill that occurs.

Also if we look closely, we will notice that as at some point where it started approaching towards the end of our data findings that the volume of oil spill is reducing, e also hope for further and total reduction as well.

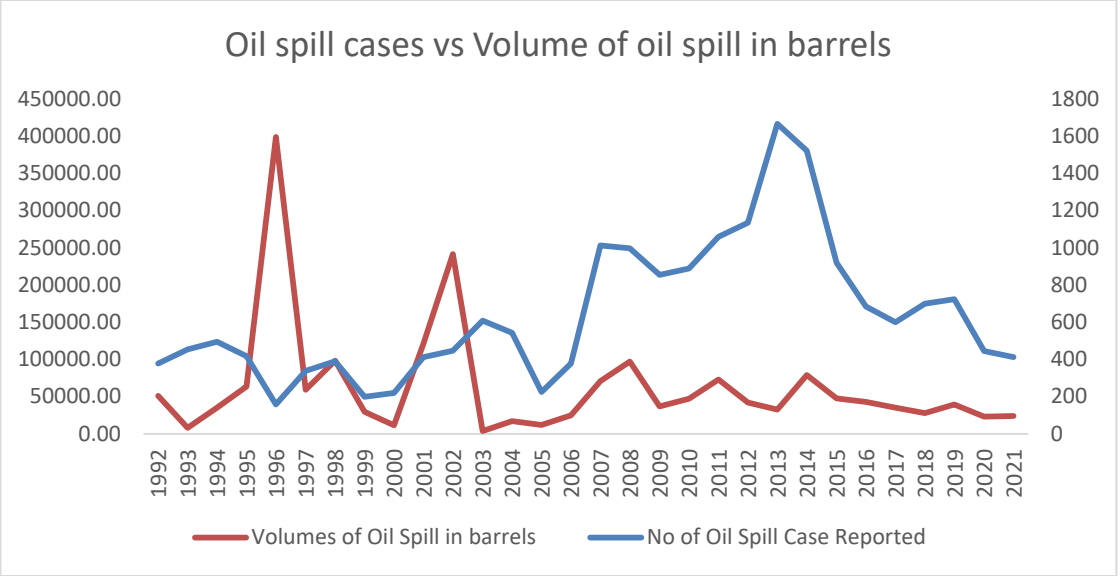
Though it is fluctuating graph but it gives a ray of hope that if better and properly managed, oil spill will be reduced.

4.3 Number of Oil Spill Cases Reported versus the Volume of Oil Spill in Barrels

Years	No of Oil Spill Case Reported	Volumes of Oil Spill in barrels
1992	378	51187.90
1993	453	8105.32
1994	495	35123.71
1995	417	63677.17
1996	158	399036.67
1997	339	59272.30
1998	390	98345.00
1999	198	29337.00
2000	219	11542.00
2001	412	120976.16
2002	446	241617.55
2003	609	3528.43
2004	543	17104.00
2005	224	11921.00
2006	378	24723.91
2007	1012	70795.77

2008	997	96847.35
2009	854	36988.09
2010	889	47261.02
2011	1059	73132.00
2012	1135	41802.00
2013	1666	32292.16
2014	1521	78890.46
2015	920	47701.63
2016	684	42734.53
2017	599	35071.82
2018	699	27784.85
2019	724	39478.97
2020	444	23114.01
2021	412	23697.58

Source: National Oil Spill Detection and Response Agency (NOSDRA), Nigeria.



Note: Graph drawn with the use of Microsoft Excel.

We will look into the comparison of both the number of oil spill case that was reported and that of the volume spill (the volume that was spill tells us about the barrel that pollutes the environment, so we have the volume as our Niger Delta environmental pollution) because it is from the volume loss into the environment that the pollution takes places.

From the graph above x axis is the year from 1992-2021, where the red line is the volume of oil spill and the blue line is for the number of oil spill case reposted.

In 1996 when oil spill volume was high it was the year with lowest number of case reported, and as 2021 the volume of oil spill and that of the number of oil spill case is on both side at it lowest.

From the trend we can see that the volume of oil spill is mostly at increasing end in the 90's and early 2000 but as the year goes by, there tends to be a fall, but that of the case reported, it tend to be fluctuating, we can therefore also site that though the number of case is high, the volume of oil spill at that particular year is low.

We can further conclude that NOSDRA should look more into the reported case to know if some cases are being withheld and if proper cleanup is been done in those affected areas.

CHAPTER FIVE

FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Findings

With the yearly report of oil spill cases reported to NOSDRA (National Oil Spill Detection and Response Agency), a graph was plotted which show a trend though fluctuating but show how many time in a year in which oil spill took place, also a graph showing the volume of oil the Niger Delta environment, though not on a steady increase or decrease but our focus was on how this spill keep deteriorating the environment of this region which most of their economics activities is being carried out, we say for sure that the Niger Delta is basically for the production of crude oil in the country generates most of yearly revenue, but that will not over look the effect that the spill of the crude oil is doing to the Agricultural, health and social-economic life of the region and how if proper measure is taken how these region will be better and also help in the generating of more revenue from its other aspect apart from oil exploration, the World health at some point have being drawn to the health effect of oil on the people living in the Niger Delta region, especially those that took part in drinking the water polluted, also from continuous body contact with the acid produced from this crude oil spill, as not everyone will be able to afford to relocate to the urban and oil free side of the Nation. As the graph shows and increase on some and the decrease but not continuous decrease which would have made us believe that this oil spill is being properly regulated and hopefully a day will come when oil spill would

not have to be a threat to the people living in such environment, because the increase in oil spill became much we could tell of the agricultural growth coming from the Niger Delta region especially the aspect of fishery, which at this point is struggling to survival in the oil spill affected areas. There we will fail to accept our null hypothesis which say, that oil spillage has no effect on the Niger Delta economy, nor does it affect the life of the people or have any effect on the Nigeria, because we can see it clearly does.

5.2 Conclusion

From the findings on the yearly barrels of oil spill been released into the environment of the Niger Delta though on a fluctuation trend, we could clearly see and easily tell that these oil spill is a yearly occurrence and this lead to a continuous deterioration every year.

From this trend I will base my conclusion as; though Nigeria has her interest the earnings coming from crude oil and have neglect for the place that is the environmental well-being of the environment and inhabitant of the place these crude oil is coming from, leaving the environment underdeveloped, and degrading as the day goes by do not speak well of her even economics development, I do not think for a nation with a future plan of attaining development it will be bad to earn from two stream of revenue, it will help her aid development faster, if the government will work to see that clean ups re done properly in the Niger Delta Region after oil spill, the

Niger Delta will also contribute to the provision of Agricultural products, and also their fishing source of living will also be revamped.

With the movement of people from the rural areas to the urban areas, it is also showing an effect on the development of the urban areas, according to my understanding of developmental economics, this movement will over populated the urban areas, pressure is now being placed on the resources, facilities and social amenities of the urban areas, also there is an increase in crime rate,, that while some of this individual go as far as sabotage of pipelines because their major source of livelihood/career is taken from them without no or little replacement or compensation. Also the dependent population becomes higher in the urban areas because most aged people will move to their offspring or relatives that lives in the urban area and these people may even have nothing doing making them dependent on the individuals they are living with.

In conclusion the Nigeria government has to improve the worth of the Niger Delta people as to what they are giving, and work on cleaning it up, if not they might keep having a deteriorating economy in the Niger Delta and this will not aid even development that the country is aiming at.

5.3 Policy Recommendations

In order to have a better economy for the Niger Delta, these recommendations should be considered.

- The federal government should provide for compensation in relation to the oil emission damage caused by activities, not of only international fuel firms but also of oil robberies, saboteurs and vandal pipelines.
- The government should set a way of making sure that the compensation are set in affecting the lives of the people affected by the oil directly that is inadequate inclusion of communities indecision affecting their lives both government and multinational companies, particularly on compensation issues, should be stopped.
- Quick environmental recovery to replenish the affected areas should be made by the oil companies after any oil spill
- Laws that will protect the environment of the host communities and provide adequate and good compensation for those affected need to be enacted.
- Oil companies are to secure the pipeline so as to prevent oil theft, sabotage and vandalism by doing daily surveillance with the help of helicopter.
- There should be an alternative source of living for those whose lands were affected by oil spill before the cleaning up process is completed.

- An economic development policy should be set in place to help improve the development in the affected areas of the Niger Delta Region to reduce pressure on the available resource in the urban areas.

Broadly to the Nigeria Government

- Government should constantly relieve pollution victims of the stress and financial hardship that currently accompanies attempt to win fair compensation through litigation or arbitration,
- Request National Oil Spill Detection and Resources Agency (NOSDRA) to establish an urgent dialog between all stakeholder and JIV process develop a complete, transparent and consistent reporting system that takes the perspectives of all stakeholders into account.
- Ensure NOSDRA offices in the Niger Delta are instructed to ensure that women in oil affected communities are informed about JIV and cleanup process and enabled participate. This will require training and support for NOSDRA field offices.
- The National assembly should pass bills that will compel oil companies to publish, annually, asset integrity data and to disclose the age of infrastructure and all repairs and replacement, and a bill that will compel the companies to take effective action to prevent sabotage and theft with effective penalties for failure to do so.

- The national assembly should ensure that all certificates of clean up and underlying data should be published and end the Department of Petroleum Resources involvement in all aspect of environmental oversight of the oil industry.

As for the international oil companies involved in the oil exploration in Nigeria should be committed to finding the solution in the Niger Delta by doing the following;

- Avoid all measure to deter sabotage and oil theft from installation are urgently reported and scheduled.
- They should publish all journals of interpersonal violence (JIV) and related images and video footage of their activities, ensure accurate photographs which show the cause and the area affected.
- Test the process by using best quality tools and publishing verifiable evidence to measure the size of the oil spillage.
- To avoid vandalism and cheating and commit to using the best available technology to prevent spills in the Niger Delta, strengthen security controls of oil infrastructure significantly.

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