

## THE ENVIRONMENTAL IMPACT OF OIL SPILL POLLUTION IN NIGER DELTA REGION, NIGERIA

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### ABSTRACT

An oil spill is the release of a liquid petroleum hydrocarbon into the environment, especially marine areas, due to human activity, and is a form of pollution. The term is usually applied to marine oil spills, where oil is released into the ocean or coastal waters, but spills may also occur on land. Oil spills may be due to releases of crude oil from tankers, offshore platforms, drilling rigs and wells, as well as spills of refined petroleum products (such as gasoline and diesel). Oil spills penetrate into the structure of the feathers of birds and the fur of mammals, reducing its insulating ability, and making them more vulnerable. This study described the damages caused by the oil industries in the Niger Delta Region; they resulted in violations of the right to an adequate standard of living, including food and water, violations of the right to gain a living through work and violations of the right to health. Different plants and animal species which are known for long history have now disappeared as a result of crude oil exploration for over 50 years causing ecological damage to the region. The study look at the impact of the oil spills in the following areas (Water, soil fertility, fisheries as well as human health). Impact on soil oil spills reduced soil fertility as well as destroying economic trees and food crops either by completely killing trees or reducing their production yield. Impact on human health, oil spill is associated with a significant increase in the period prevalence for diarrhea, sore eyes, itchy, skin and occupational injuries, shock acute, renal failure, extensive epiderolysis, conjunctivitis, microsites, esophagitis and chemical Pollution on water bodies, the Niger Delta region's ecosystem as noticed by the Shell Petroleum

Development Company has undergone Sensitive changes in water quality such as salinity, PH, and heavy metals. 75% of families in the Niger Delta region rely on fishing in Land Rivers and offshore for income and food to survive, damage to fisheries is widely acknowledged. A study shows six major causes of death diseases in Nigeria (measles, tuberculosis, dysentery, tetanus, malaria and pneumonia) the coastal area forms a zone for these diseases as a result of oil spills.

**Keywords:** Health, Soil, Water and Environment.

## INTRODUCTION

### The Niger Delta Region;

The region got its name because it is located at the mouth of the River Niger. The Niger Delta has a population of approximately 31 million people and more than 40 ethnic groups. It is sometimes called oil rivers because the majority of palm oil produced from Nigeria is from there. The Niger Delta extends over 70,000km<sup>2</sup> and makes up to 7.5% of Nigerian land mass. Salt and fish were the main economic activities before the creation of Nigeria States. The largest ethnic groups in the Niger Delta region are Ijaws followed by Itsekiris, Ibibio's, Yoruba and other small groups. The region comprises the state of Abia, Imo, Delta, Edo, Rivers, Bayelsa, Cross Rivers, Akwa-Ibom and Ondo. (UN, 2011).



Figure 1: The Constituent State of the Niger Delta, Nigeria.  
Source: Idemudia and Ite, 2006.

Different plants and animal species which are known for long history have now disappeared as a result of crude oil exploration for over 50 years causing ecological damage to the region. Another impacts decrease soil fertility and the life span of the inhabitants, abnormal birth babies have increased, is a serious problem causing death of small children throughout the area. A study shows six major causes of death diseases in Nigeria (measles, tuberculosis, dysentery, tetanus, malaria and pneumonia) the coastal area forms a zone for these deceases, HIV/AIDS is also a serious problem, there are 930,000 HIV/AIDS orphans in Nigeria. (UN., 2011).

### **MEANING OF OIL SPILL**

Okey,(2000) defined an oil spill as; "Release of a liquid petroleum hydrocarbon into the environment, especially marine areas, due to human activity, and in a form of pollution". The term oil spill is usually applied to marine oil spills, where oil is released into the ocean or coastal waters, but spills may also occur on land. Oil spills may be due to release of crude oil from tankers, offshore platforms, drilling rigs and wells, as well as spills of refined petroleum products (such as gasoline, diesel) and their by-products, heavier fuels used by large ships such as bunker fuel, or the spill of any oily refuse or waste oil (Okey., 2000).

### **OIL SPILLS RECORD IN NIGER DELTA REGION**

The record shows that, the Niger Delta Region of Nigeria has experienced approximately 273 oil spills resulting in about 115,000 barrels of crude oil from 1976 to 2001 annually. This has been the worst in the history of the world. No one can exactly assess the oil spills in the Niger Delta Region because of inaccurate information. Government and private companies come out with different data on oil spills which are believed to be unreliable because both may be avoiding their responsibility, claims and compensation of damage from victims. (Zabey, 2009)

## **CAUSES OF OIL SPILL IN NIGER DELTA REGION**

- Pipeline vandalization; is not a new thing to the people of the Niger Delta region. The spill occurs as a result of sabotage, 28 percent of spills in the Niger Delta area as a result of sabotage.
- Sabotage is referring to the intended performance to stop or cause delay in the production of petroleum products.
- Corrosion of pipeline; This is another problem that causes oil spills in the Niger Delta region resident from the region break pipeline with the intention of collecting petroleum product and this result to spill, 50 percent of spills in the region is due to corrosion (Aroh et al., 2010).

## **ENVIRONMENTAL IMPACT OF OIL SPILL IN NIGER DELTA**

### **Impact on Soil**

Oil spills reduced soil fertility as well as destroying economic trees and food crops either by completely killing trees or reducing their production yield. Investigation shows 60% reduction in household food security was assessed by using the Cornell-Radimer scale (Brisibe., 2010). Oil spill also reduced the quality of food crops as well as the content of ascorbic acid. The content of water leaf was reduced by 36% while the crude protein content of cassava was reduced to 40%. The food insecurity and declaim of the quantity of the food led to a 24%. An increase in the incidence of childhood malnutrition was noticed in oil spill communities. The oil spill also caused by the bio-accumulation of heavy metals in the surviving food crops like cassava and pumpkin, the concentration of lead and cadmium traced in the leaves of pumpkin is 90% and 94.29% respectively. Cadmium and Lead are the elements that have a high level of risk to human through plant intake-dietary' (Brisibe., 2010).



Figure 2: impact of oil spill on soil.

Source: Brisibe., 2010.

### IMPACT ON HEALTH

Oil spill is associated with a significant increase in the period prevalence for diarrhea, sore eyes, itchy, skin and occupational injuries, shock acute, renal failure, extensive epiderolysis, conjunctivitis, microsites, esophagitis and chemical pneumonitis were reported in a 2 year old boy treated for febrile convulsion with a Nigerian crude oil. Apart from the above issues the toxicity to humans causing respiratory illness, leading to kidney disease, neurological disease and potential death are all as a result of the oil spill. In 2008 in Bodo, Ogoniland, in the Niger Delta, oil spills caused by a Shell pipeline resulted in tens of thousands of barrels of oil polluting the land and surrounding of Bodo, a Niger Delta town (Osuji and Opiah, 2007).



FIGURE 3: (Source Amnesty International., 2010).

Fishing and farming were the major occupations for both men and women in Bodo. The oil spill has now been significantly affected the people in the community, leading to poverty, significant lack of food, and reducing sources of clean food and water. The community is also dealing with the health risks of eating fish and crops exposed to oil spills and as the United Nations Environmental Program report puts it: "petroleum hydrocarbons can enter people's bodies when they breathe air, bath, eat fish, drink water or accidentally eat or touch soil or sediment that is contaminated with oil"(Osuji and Opiah, 2007). In other words, people may be at risk or exposed to both volatile and nonvolatile components, some of which are capable of being absorbed through the skin causing skin irritations or other skin diseases. The main source of inhalation exposure is volatile chemicals, of which the main classes are alkanes, aromatics and sulfur compounds (Brisibe., 2010). The health effects associated with the exposure of oil spill includes the overt signs of acute intoxication in humans - dizziness, nausea, shortness of breath, headaches.

## **POLLUTION OF WATER BODIES**

The Niger Delta region is a wetland, the health of the environment and the lives of people in the region are intertwined with the quality of the water system. The food, water, and cultural identity of many local peoples are closely related to the delta ecosystem. The rivers and streams are used for drinking, bathing, fishing, harvesting, and fermented cassava. The Niger Delta region's ecosystem as noticed by the Shell Petroleum Development Company has undergone Sensitive changes in water quality such as salinity, PH, and heavy metals. In relation to this problem, one of the most disturbing findings of Amnesty International's research on the rivers, streams and ponds, wells as well as drinking water, have found that for many years they were receiving bodies for oil spills and waste discharge due to oil spill in the region as well as dumping drilling waste. (Brisibe., 2010). The environmental impact of this performance by oil companies has meaningfully affected Niger Delta's waterways.



Majority of the Niger Delta's population has no access to good or potable water as a result of the oil spill. Many communities depend on poor surface water and wells for drinking and other activities such as bath or washing, and this leads to health problems from waterborne diseases. Three-quarters of all rural communities in the Niger Delta do not have access to safe water sources. Investigation shows that thousands of people lost access to their main source of drinking water after an oil spill, and children reported skin and eye problems after diving in the oil-contaminated river (Amnesty International., 2009).

### **DAMAGE TO FISHERIES**

75% of families in the Niger Delta region rely on fishing in Land Rivers and offshore for income and food to survive. Damage to fisheries is widely acknowledged by governmental and non-governmental sources as one of the major impacts of the oil industry. "(Osuji and Opiah, 2007). According to UN Food and Agriculture Organization (FAO): For brackish-water resources, the state of the resources is deplorable. Fishing activities are very high, due to employment for people in the communities. Oil spill impact further complicates the situation, by damaging the aquatic life in the area, because of oil exploration there are no more fisheries. "We experience the hell of hunger and poverty, Plants and animals do not grow well, the fish died". According to the Niger Delta residents (Osuji and Opiah, 2007). Oil spill Pollution kills fish, their food sources and fish larvae, and damages the ability of fish to reproduce, causing both immediate damage and long-term harm to fish stocks. When oil and wastes are released as a result of spill into a body of water, fish are directly exposed to pollutants and can die. In a moving body of water, such as a river, fish may be able to be able to move away from the affected area of oil pollution but fish eggs and larvae cannot escape and frequently die. This has caused a major decline in overall stocks, according to fisheries and environment pollution experts.(Amnesty International., 2009).



FIGURE 4: Impact of oil spill on aquatics. Source: (Amnesty International., 2009).

### **OIL SPILL CLEAN UP**

Biological remediation is one of the processes used in the Niger Delta for oil spill cleanup. This method detoxifies and restores ecosystems damaged by oil spills. Bioremediation process involves the biological components in the remediation or cleanup of a specific site. A study conducted in Ogbogu located in one of the largest oil producing regions of Nigeria has utilized two plant species to clean up spills. The first plant used in oil spill cleanup is *Hibiscus cannabinus*, a plant species indigenous to West Africa. *Hibiscus cannabinus* is an annual herbaceous plant originally used for pulp production. This plant species has high rates of absorbency and can be laid down on top of the water to absorb oil. The oil saturated plant material is then removed and sent to a safe location where the hydrocarbons can be broken down and detoxified by microorganisms (Limson., 2002). The second plant used as means of oil spill cleanup in the Niger Delta region is called or known as *Vetiveria zizanioides*, a perennial grass species. *Vetiveria zizanioides* has a deep fibrous root network that can both tolerate chemicals in the soil and can also detoxify soils through time requiring little maintenance. The people of Ogbogu use these methods of bioremediation to improve the quality of their drinking water, soil conditions, and the health of their surrounding environment (Limson., 2002).





FIGURE 5: Hibiscus cannabinus.

Source: <http://www.google.co.uk/imgres>

However in Imo State of Nigeria, (Niger Delta region) a study was conducted in the city of Egbema, (Imo State) on microfloral. These microorganisms have the ability to break down the oil, decreasing the toxicity conditions and are recognized as another method of bioremediation and scientists are trying to determine whether the properties these microorganisms possess can be utilized for the cleanup of future spills (Okereke et al., 2007).

## CONCLUSION

This study described damages caused by the oil industries in the Niger Delta region, they resulted in violations of the right to an adequate standard of living, including food and water, violations of the right to gain a living through work and violations of the right to health. Only when there is effective accountability, and when people are given the information and space needed to participate in decisions that affect their lives, then the human rights tragedy of the Niger Delta begins to end. The problem of oil spill in the Niger Delta region is as a result serious failure of the Government of Nigeria. Amongst the critical failures of the Government are:

### **Multiple Failures to Effectively Regulate and Control the Oil Industry**

The regulatory system in the Niger Delta is deeply flawed, and lacks independence. The oil companies are too involved in the regulatory

system, and the main government agency the Department of Petroleum Resources is both ineffective and represents conflicting interests. Despite their commendations by numerous bodies, which includes the African Commission on Human and Peoples' Rights (African Commission), the Nigerian Government, Environmental Protection Agency Act (FEPA).

### **Failure to Deal with People at Risk**

Human rights law requires special measures to identify and protect the human rights of groups that are at risk. The largely poor communities of the Niger Delta face clear risks from oil company operations. However, the Government has not provided adequate protection, let alone special measures, to protect their human rights. This study finding is related to the Shell Petroleum Development Company (SPDC), they are the main operator in the land of the Niger Delta region in Nigeria. The vast majority of the cases of oil spill in the region which was reported by Amnesty International and other organizations relate to the cases involving SPDC..

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