
Impact of Oil Spill on Environment, Human Health and Economy in Nigeria

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ABSTRACT

Oil spills have been reported over several decades in many parts of the world but Nigeria has been greatly affected by oil spillage in recent years. Harmful effects of oil spills on humans and environment have been extensively studied. The presence of oil and their constituents in the environment are capable of exerting some acute and long-term adverse health effects. Some carcinogens like pyrene and polycyclic aromatic hydrocarbons were found in the surface water and soil and therefore its affect the environment via affecting soil, water and air which directly or indirectly harms humans, plants and marine ecosystem. The effects of oil spillage not only limited to environment and human health, it has also affect the economy which are included livelihoods, farmland and wild life of the country.

Keywords: oil spill, health, environment, ecosystem

INTRODUCTION

The environment is a major determinant of health. Human health is influenced by many ways, through physical exposure, biological and chemical risk factors. Because of permanent interaction between human and environment, our health is to a considerable extent determined by environmental quality. The World Health Organization defines health as a state of complete mental, physical and social wellbeing (WHO, 1948). Bro-Rasmussen (1996) indicated that toxic chemicals at low concentrations will not immediately kill humans, however depending on their potential to bioconcentrate when climbing the food chain, persistent chemicals may

create a human hazard in case of chronic ingestion.

The environment has been recognized as an important contributor to the attainment of good health. The quality of environment affects humans, influencing his actions while humans' actions and inactions influence his environment (Roche, 2003). Nigeria facing many environmental problems like deforestation, water pollution, industrial pollution and oil pollution. The most important environmental problem in Nigeria is exploration and exploitation of oil and gas by which most of the areas are polluted (Onu and Opara, 2001).

A growing concern in the field of environmental health is the

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impact of oil spillage on the wellbeing of individuals, residing close to the affected areas as well as the degradation of the environment resulting from such spills. Oil is composed of both volatile chemicals that quickly escape into the air, and denser chemicals that are made of chains of carbons. Some of the volatile chemicals are associated with increased cancer risk.

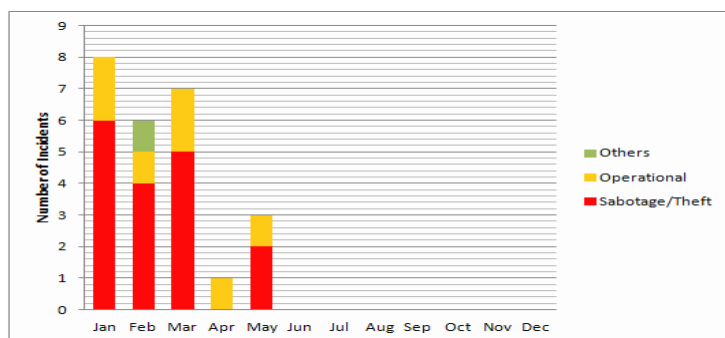
Oil spills have been reported over several decades in many parts of the world from Africa to North America. The Niger Delta region of Nigeria has been greatly affected by oil spillage with its devastating effects on the environment and the humans. Oil spills are common event in Nigeria (Baird J., 2010). Half of oil spills occur due to pipeline and tanker accidents (50%), other causes include sabotage (28%) and oil production operations (21%) with 1% of oil spills being accounted for by inadequate production equipment. Corrosion of pipelines and tankers is the rupturing or leaking of old production infrastructures that often do

not receive inspection and maintenance (Nwilo P.C. and Badejo O.T., 2001). Due to oil spill the people of Nigeria and the environment of Nigeria suffered from health problems, greenhouse effect, acid rain (Nosike and Opara, 2003).

The main ecosystem constituents affected by the spills are generally seaside flora and some fauna such as birds and mollusks. When a big spill occurs, there is usually a large group of volunteers, in general local inhabitants, who take part in the cleanup work to minimize the impact of oil spill on the natural and economic resources and recover the coastal environment. These individuals constitute an exposed population whose health may be affected by the noxious properties of the oil.

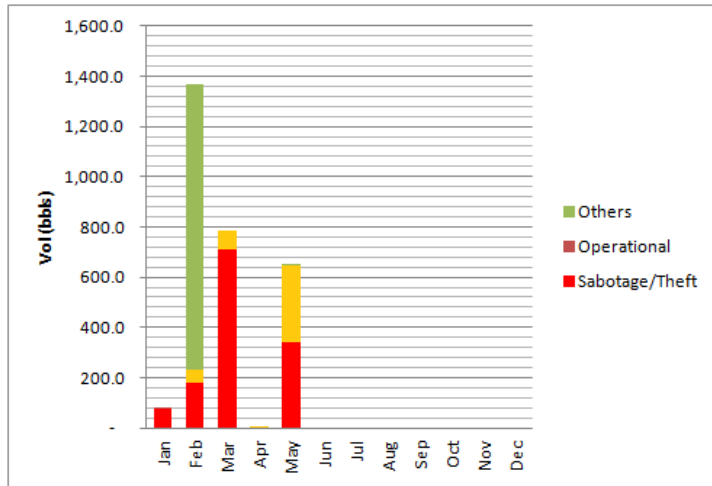
There are so many ways like sabotage/theft, operational and others which indicate that the oil spill incident has occurred in Nigeria. Monthly oil spill incidents and volume of oil spills/month (bbl) in 2016 are given in diagram (Shell Nigeria).

Figure 1: Monthly Oil spill incidents in Nigeria (2016)



Source: Shell Nigeria

Figure 2: Volume of oil spill/month (bbl), 2016



Source: Shell Nigeria

The objective of this manuscript is to review the studies on the effects of oil exposure on environment and human health.

Sources of Oil Spill:

Oil spill is the release of liquid petroleum hydrocarbon into the environment especially in marine areas due to human activity. Oil spills in the environment in many ways.

- Oil spills may be due to release of oil from tankers, drilling rigs and wells.
- Discharge of oil from refineries, oil storage facilities and oil terminals.
- Emission of gaseous hydrocarbons from vehicles exhausts.
- Natural disasters like earthquakes, adverse weather conditions are also responsible for dumping of oil into the seas and oceans.

Effect of Oil Spill on Human Health:

The effect of oil spills on humans may be due to direct and indirect contact with the spill. The main effects of oil spill on humans include a variety of health effects.

Direct exposure to oil spill:

People can be exposed to the chemicals in oil by breathing them, by swallowing them or by touching them. Studies show consistent evidence of acute toxic effects mainly neurological, ocular and respiratory of those living in exposed communities and among cleanup workers (McCoy Margeret A. and Salerno Judith A., 2010).

Ingestion and inhalation of the constituents of the spilled oil have acute and long-term health implications. Exposure to these constituents in the two-year-old child could result in acute renal failure

(Otaigbe and Adesina, 2005), hepatotoxicity (Eyong et.al., 2004), and hemotoxicity (Sunmonu and Oloyede, 2007).

Indirect Exposure to Oil Spill

Indirect exposure to oil and their constituents through consumption of contaminated food and water especially in the consumption of fish and other sea foods. This is because some components of oil have ability to bioaccumulate in these organisms. Consumption of such polluted animals' humans may become seriously exposed to higher concentrations of oil components.

Table: Petroleum products and their effects

Petroleum Product	Source	Effects
Benzene	Oil, Coal, Natural Gas	<ul style="list-style-type: none"> • Carcinogenic • Causes leukemia, breast and urinary tract cancer. • It reduces red and white blood cell production in bone marrow. • Decreases function of T-cell and B-cells. • Causes chromosome aberration.
Sulfur Dioxide	Oil, Coal, Natural Gas	<ul style="list-style-type: none"> • Causes lung cancer and other pulmonary diseases. • Causes asthma and heart diseases.
Formaldehyde	Natural Gas	<ul style="list-style-type: none"> • Carcinogenic • Causes leukemia and nasopharyngeal cancer. • Causes genotoxicity and infertility.

Petroleum Product	Source	Effects
Polycyclic Aromatic Hydrocarbons (PAH)	Oil and Coal	<ul style="list-style-type: none"> • Carcinogenic and genetic mutagenic • Exposure linked to childhood asthma, low birth weight and DNA damage.
Hydrofluoric Acid	Oil and gas	<ul style="list-style-type: none"> • Damage lungs leading to chronic lung diseases.

Effect of Oil Spill on Environment:

Many oil spills contaminate the environment i.e., air, water and soil. There are two types of oil- light oil and heavy oil. Fuel oil such as gasoline and diesel are light oil and it is volatile in nature i.e., they evaporate quickly so they usually don't remain for longer in the environment. Heavy oils persist in the environment for months or even years. Environment Protection Agency (EPA) as well as various state agencies may conduct specific studies following oil spills in order to determine the extent of the spill. Different types of oil behave differently in the environment, animals and birds are affected differently by different types of oil. Light oils can kill animals and plants and they also toxic to humans who breathe their fumes or get them on their skin. While heavy oils are significantly less toxic than light oils. Long-term effects of heavy oils show some chronic health effects like tumors in some organisms.

Some birds exposed to oil also experience changes in their hor-

monal balance (C. Michael Hogan, 2008). The majority of birds affected by oil spills die from complications without human intervention (Dunnet *et.al.*, 1982). Furred marine mammals exposed to oil spills are affected in many ways. Oil penetrates into the fur of animals and it reduce the insulation and leading to fluctuations on body temperature and hypothermia.

Economic Implications of Oil Spillage:

Nigeria is the one of the largest producer of crude oil in African Continent. Since 2014, Nigerian petroleum industry contributes about 14 per cent to its economy. Therefore, Oil industry became a back bone for the Nigerian economy because over 95 per cent export earnings and about 40 per cent revenue of the come from this sector (IMF). Though this sector having an important role for the Nigerian economy but due to its oil spills, it has also become a challenge for the economy itself. In the first section, we discussed about the environmental ef-

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fects due the oil spillage but is has some economic impacts also which are equally important for the Nigerian economy. Traditionally the people of Niger delta are depending on farming and fisheries for their liveli-

hood but due to spillage it has been destroyed local economy even the farmland and wild life too and the results of this, the poverty rates in this region has increase rapidly.

Figure: 3



Figure: 4



Figure: 5



Oil spillage has also created food shortages in this region. As compare to oil worker the people of this region have low purchasing power and due to this many do not eat well. With destruction of wild life, fisheries and farming land most of the people gets unemployed because this sectors are the latest employee of labour in the area.

CONCLUSION

Crude oil has a major source of energy to African Countries. Oil spillage is the major issue in almost all the oil producing countries, Nigeria is one of them. It affects the economy of the nation. Most of the oil spills are caused by humans; it can be reduced when one takes proper safety assessments and precautions. Some preventive measures should also be adopted by the Government to prevent oil spilling. According to Shell Nigeria most of the oil spillage incidents and volume of

oil spill/month was happened due to third party/others activities and for this there is no provisions of compensation are available in Nigeria. But according to Nigeria's Oil Pipeline Act the provisions are made to discourage sabotage/theft activities. Whatever the case is there in such areas where members of communities are facing acute problem of oil spillage and it is not fair enough to allow these people to face the dire situation alone; at least they should get some relief and immediate medical attention.

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