

PETROLEUM OIL, ENVIRONMENTAL POLLUTION AND HEALTH MANAGEMENT IN NIGERIA: (A CASE OF THE NIGER DELTA REGION)

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ABSTRACT

Petroleum oil exploration has dominated Nigeria's Economy since 1960s, contributing to about 80% of Federal Government revenue and 90% of the total export. Field-based data confirm that, oil exploration is also associated with the deplorable state of the Niger Delta environment, principally due to oil spillage and gas flaring. Emerging evidence from the present study show that in Akwa Ibom State, serious health complications have been noticed among children between the age of 1 to 10 years. Such complications include: chronic malnutrition, mental retardation, stunted growth, lost of memory, communication deficiency, and etcetera. The above imply that, such children will turn out to be adults who are physically and mentally unfit to complete in a fast growing world. They study therefore made useful recommendations that could prove useful in addressing the hazards pose by oil exploration in the area.

KEYWORDS: Petroleum Oil, Environmental Pollution, Health Management, Sustainable Development

INTRODUCTION

Since 1958 when oil exploration from Oloibiri field began, the contribution of the petroleum oil industry to Nigerian's development has been outstanding. As a consequence, offshore drilling terminals continue to litter the southern reaches of the country, extending into the Atlantic Ocean. According to OMPADEC quarterly Report (1993), the Niger Delta, which is a 70,000km² sedimentary basin of oil and gas, is particularly exploited by Multi National oil companies (see Fig. 1). Oil exploration companies such as Shell, Elf, ADDAX, and EXXON/Mobil, have carried out oil exploration and drilling activities in and around the area for some decades now (Baker, 1981; Ekong, 1998; Etuk et al., 2001). Paradoxically the role of these oil companies in depressing environmental and health situation in the oil-producing communities has also been considerable (Okorji, 2000 and Dokun, 2005). In connection with the above, the steering committee of the Niger Delta Environmental Survey (NDES) in 1995 noted that:

“In spite of the delta's resources endowment, its immense potential for economic growth and sustainable development, the region is under increasing threat from rapidly deteriorating economic and environmental conditions and social tensions which are not being addressed by current plicies”. (NDES, 1995:12).

As far back as 1995, the oil producing community's situation attracted international attention, calling for a warning by the World Bank that, an urgent need is required to evolve mechanisms to protect the life and health of the regions inhabitants and its ecological systems from further deterioration (World Bank, 1995; Ukpong, et al., 1999; Attah,

2001; and Omoweh, 2005). In just a matter of few decades, environmental pollution of the coastal waters through oil spillage and exploitation activities have brought destruction to both terrestrial and aquatic life. Farmlands, fishing posts and shelters, have also been devastated in affected communities, through thermal pollution by gas flares and resulting acid rain. Consequently, the lot of the already poverty stricken inhabitants has deteriorated. Poor health status of inhabitants through malnutrition top the list, worst affected have been children between the ages of 0-10 years and pregnant women. It is the intension of this study to abuse the impact of oil exploration which has resulted in hydrocarbon pollution of air, soil and water, and how this has affected the health of children between the age of 0-10 years in the oil producing communities, and what policy measures could be adopted to solve the problem.

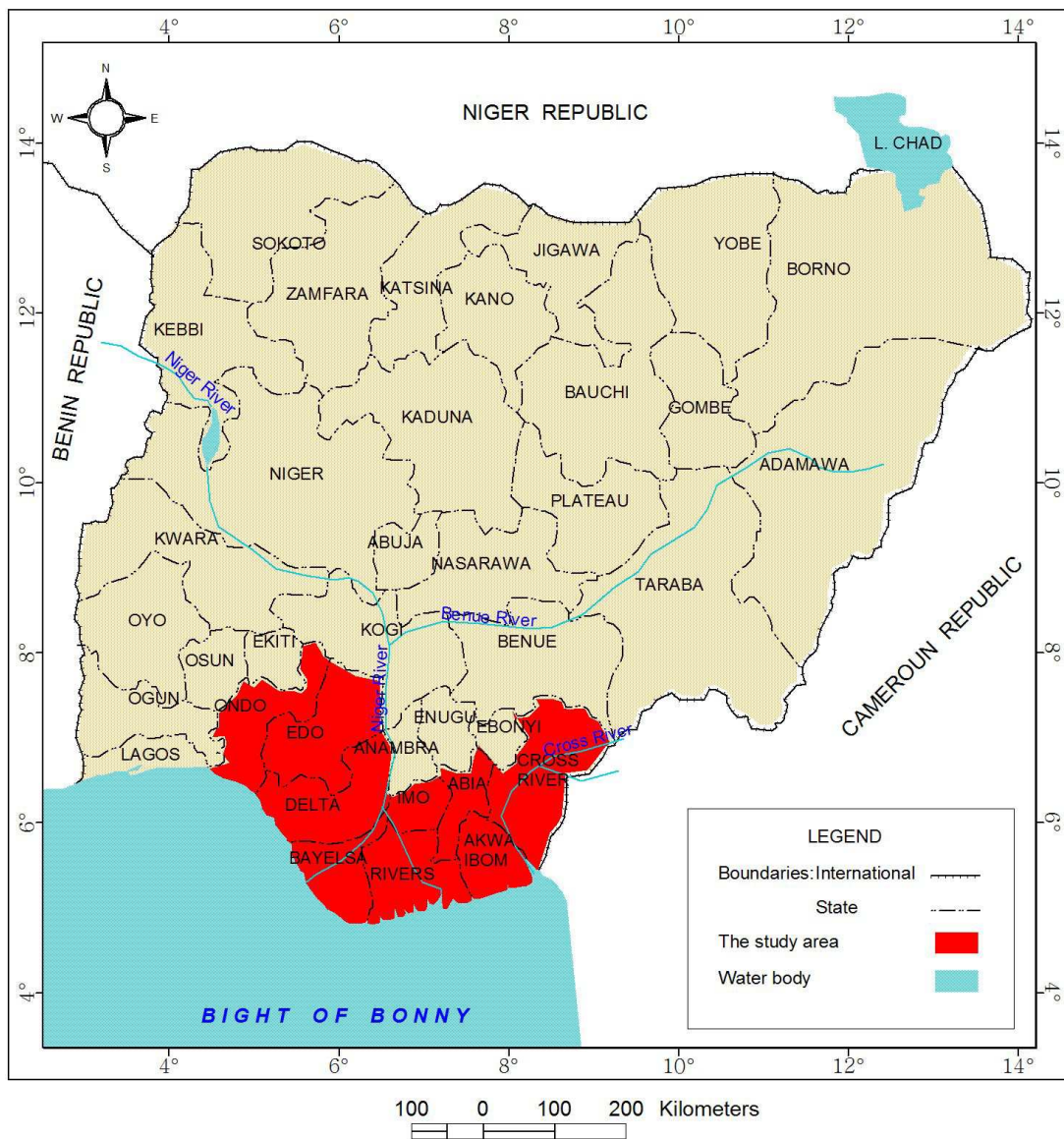


Figure: 1 The Location of the Niger Delta Region on the Map of Nigeria

THE PROBLEM IN CONTEXT

Globally, environmental pollution (air, land and water) has attained an alarming state. The effects of pollution on the flora and fauna cannot be over-emphasized. According to Ukpogon, et al. (1999), the environment is considered polluted

when an injurious or lethal substance is introduced, which by fouling it reduces the satisfaction and utility that is derivable from living or working within it, thereby increasing the risk of its inhabitants of malnutrition, diseases, and death (Also see Isichei, et al. 1979 and Maimo, 1995).

The problem of environmental pollution in the Niger Delta Communities emanates when the region became a major oil producing region of the world. Studies show that, the region produces about two million barrels of crude oil and an average of 1.8 million standard cubic feet (SCF) of associated gas daily (Hodges, 1979). Most of the gas is flared because of the lack of commercial gas outlets. Enquiries at NNPC put the ratio of gas flared to gas utilized at 80:20, thus rendering an enormous volume of 1.44 billion SCF of gas to be flared away daily into the Niger Delta Environment. This represents an annual atmosphere load of 526.6 billion SCF of gaseous pollutants. (Okoji, 2005; Human Rights watch, 1999). One can then imagine the amount of these pollutants injected into the Niger Delta Environment since 1956. (Also see Ojofolu, 1983, Nwankwo, et al, 1981).

Research currently conducted in the Niger Delta shows that the atmosphere from time to time sheds its load of pollutants through acid on the terrestrial or aquatic environments. Also, the production of carbon monoxide and dioxide during gas flaring implies two carbon related problems: one is the greenhouse effect and global warming phenomenon. The other is "carbon-monoxide-hole-depletion" phenomenon in the upper atmosphere (Okoji, 2000 and World Bank, 1996). According to Kaladomo (1996), the latter has resulted in the depletion of the ozone layer which forms a protective covering from ultra violet radiation from the sun. (Also see Okoji, 1995; Abe, et al., 1986, and Moses, 1985). Environmentally significant consequences of gas flares that are discharged into the Niger Delta atmosphere and dispersed by its turbulence may be summarized to include:

- Thermal conduction/convection into the environment
- Pollution chemicals such as carbon dioxide, carbon monoxide, sulphur dioxide, hydrogen sulphide and volatile organic compounds
- Particles in the form of black soot and smoke
- High radiant energy (light and heat) and noise waves propagated into space (Kaladomo, 1996)

Apart from the high vertical flares at the refineries and petrochemical plants at Port Harcourt, Warri, Eket/Ibenu, etcetera, most other flares are horizontal. Horizontal flares, because of their low positioning tend to have higher concentration of heat and invariably high chemical pollutants in its immediate environment, and their effects on both the environment and biological population are severe. In the light of the above, the present investigation seeks to answer the following questions:

- What are the adverse effects of petroleum exploration on human/aquatic environment generally?
- Is there any adverse effects of gas flaring on the health of children in the area?
- What measures could be adopted to reduce the effect of gas flaring on children's health?

Answers to the above questions require much deeper analysis since the issue of oil exploration is of vital importance to the economy of Nigeria. (Also see Donnelly, 2005; Uwem, 2003; and Kenedy, 2007).

THE STUDY LOCALE

The localities under study include Ekpan, Ogheye, Itsekiri, Ugbori, and Ekurede in Delta State, and Esit Eket, Eket, Ibeno, Eastern Obolo and Mbo in Akwa Ibom State. The essence was to determine the effects of petroleum oil exploration on the health of children. These communities are located in the oil-rich Niger Delta region of South-South Nigeria where oil exploration has been in operation for over 30 years now.

RESEARCH DESIGN AND SAMPLING

To achieve the aim of this study, six case studies were undertaken after a Pilot Assessment Surveys (PAS). Two Focus Group Discussions (FGDs) were held, one in Ekpan (Delta State) and Esit Eket (Akwa Ibom State). The FGDs was to obtain first hand information where it was not obvious during the pilot survey and case studies. Four trained field assistants were recruited. thehs was to obtain first hand information where it was not obvious during the pilot survey and case studies. Four trained field assistants were recruited. They were helpful during the FGDs and Case studies. They assisted in interpreting the questions in the local dialects and also recorded responses. The study was carried out between March and September, 2010.

EFFECTS OF OIL EXPLORATION IN NIGERIA: AN OVERVIEW

Crude oil is composed of hydrocarbon (HC) and non-hydrocarbon (NHC) materials. The NHC components include sulphur, oxygen and nitrogen compounds, as well as heavy metals such as copper, lead, mercury, etcetera (NDES, 1995; WB, 1995; and NNPC, 1990). NHC are toxic to living cells when their concentrations occur beyond certain levels. Oil spillage and leakages are common in areas where oil exploration and drilling activities take place resulting in introduction of higher than normal concentration of the basic NHCs in both land and water. This causes destruction of both aquatic and terrestrial plants and animals (Also see Kaladomo, 1996, Imevhore, et al., 1985; Ejibunu, 2007).

Studies by many researchers have confirmed that contamination of aquatic life in coastal regions of Delta and Akwa Ibom States by toxic pollutants in common. Also, Etuk, et al., (2001) Greenpeace, (1994) and Amnesty International, (2004) showed that aquatic animals in Ibeno, Eket, Ekpan, Ugbori, Ekurede, Oron, etcetera, where oil drilling activities are gradually dying off. Also, oil polluted water, is no more save for coat sea-weeds and other organisms, which serve as food for fish and other aquatic animals. In addition, both edible and non-edible seafood are heavily reduced. According to Isidie and Sanford (1979), the effect of gas flaring in Southern Nigeria has resulted in thermal pollution effect on surrounding vegetation of the Niger Delta Communities. In this case, animals have migrated from their ecological niches, while vegetations, farmlands, swamps and marshlands had begun to dry up. Hydrocarbon and other gases from these gas flares result in air pollution which is detrimental to health of inhabitants, who inhale the polluted air, resulting in Cancer, heart and respiratory disease etcetera. (Alcobo, 2000; Ekpo 2004; Ibaba, 2001 and Okonta, 2001).

Generally speaking, Hydrocarbon pollution affects Akwa Ibom and Delta States in several other ways. These include:

Oxygen Depletion and Production of Noxious Gases

When spillage occurs, the crude oil spread and form blanket on the water and soil which does not permit easy diffusion of oxygen in and out of the systems. Under such conditions, living organisms in these systems die of saturation. Also, the progressive decomposition of sludge blankets containing organic solids cause harm to the ecosystem.

Direct Damage to Marine / Aquatic Life

As Spillage occurs, the water becomes polluted and as a result of the toxic nature of the crude oil, aquatic animals like fishes and birds either die or migrate. Aquatic plants are also affected and they die off. Also, where pollution occurs, subtle changes in the behavioural patterns of aquatic organisms are experienced. Fishes lose their ability to swim and hence, cannot escape from predators, avoid injuries or reproduce young ones.

Direct Damage to Farmlands

Farming Communities in the oil producing states lost large areas of land to crude oil pollution, with crops destroyed.

Pollution of the Source of Drinking Water

In Areas where wells are used, spillage has covered up well, even polluting the ground water sources. Likewise, rivers and inland waters have been rendered unfit for human animal use.

Studies by Nna (1999), World Bank (1995) and Ugochukwu (2002) confirm that, when man or organisms consume hydrocarbon in their food or water, it finds its way to the fatty tissues of these organisms and therefore magnifies up the food chain of man. (Also see WB, 2002; Uwem, 2003; HRW, 2002; Frynas, 2001; and Ejibunu, 2007, 2008).

FINDINGS

Effects of Petroleum on Human Environment

On the question: What are the adverse effects of exploration on human / aquatic environment? Emerging data from field survey show that oil exploration is often associated with geographical prospecting, drilling, extraction / production, refining, transportation, and waste management (gas flares, toxic effluent discharge) by oil companies. Findings from the present study show that consequences of environmental pollution by oil companies include:

- **Land:** Landscape Disturbance
 - Deforestation
 - Aesthetic Deterioration
 - Desertification
 - Reduction of Land Arability
 - Ecosystem Destabilization
 - Soil Degradation
 - High Toxicity to Consumers
 - Reduce Life Span of Aquatic Organisms
 - Migration of Surface / Ground Water Quality
 - Malnutrition

- **Air:** Migration of Birds and Animals
Ecosystem Disturbances
Acid Rain (Leading to Damaging of Roofs and Soil)
Inhalation of Polluted Air (Leading to Respiratory Dysfunction and Cancer).
Landscape Disturbances.
- **Socio-Economy:** Poverty
Hunger
Thirst
Malnutrition
Prostitution / HIV – AIDS
Teenage Pregnancy
Child Mortality
Derelict Shelters
Kidnapping, Arm-Proliferation, Abduction, Armed Rubbery and Terrorism
Youth Restiveness

Confirming with the above findings, one of the respondents during the FGDs from Esit Eket lamented thus:

“I lost all my farmlands during the last oil spillage. All the crops I planted died off and the Compensation I was promised has not come up till now. This situation has put me in a very tight financial stress because I depended on my farm for survival”.

And another respondent from Esit Eket confirmed:

“You can see that I replaced the roof of this building last year, but look at how it is today, just a year after. The gas flares have almost damaged the entire building and there is no hope that I will have money to replace it again”

Yet, another respondent explained:

“The reasons behind the high incidence of health problem in this area is polluted air through gas flaring that we are breathing in and the contaminated water we drink due to oil spillage. You can see that majority of us are having on e form of health problem or the other”.

The above testimonies go to confirm what Baker (1981), Etuk et al (2001) have Ukpong, et al., (1999) and Attah (2001) observe differently that oil exploration is associated with environmental, health and socio-economic complications.

Gas Flaring and Children’s Health

On the question: is there any adverse effect of gas flaring on the health of children in the area? Findings from FDGs and PAS confirm that there are severe adverse effects of gas flaring on children's health in all the communities that oil exploration / gas flaring take place. Findings from present study also confirmed that, in addition to other socio-economic problems, children particularly those between the age of 1 – 10 suffer from diseases such as kwashiorkor, marasmus, eye problems, mental disorder, abdominal problems, epilepsy, deformity, polio menegaitis, etcetera, have been observed among several children from these communities. Other physical characteristic include shrunken physique, severe muscle wasting, loss of subcutaneous fat in the buttocks (baggy pants), retarded milestones (cannot walk or talk) and swollen feet. Also observed are children with stunted growth, old women's face, skin infection, swelling of feet, etcetera. The present findings also show that there has been complete absence of protein (protein deficiency) in the diet of these children. When the aquatic and terrestrial lives are destroyed through oil spillage and gas flaring, basically, the entire protein source of the community is totally destroyed, and children being those that need protein for their growth become the vulnerable class. To confirm what has been observed during the PAS, one of the participants lamented:

“My four children are now suffering from complicated health problems that I cannot understand. The second to my last child has refused to grow and is developing swollen stomach and legs. I was advised to take him to the hospital but there is no money”

And another participant added:

“The health condition of my baby is growing worst. Her skin is changing with rashes all over her body. She is not growing as she should and she cries more than before. I also noticed that she cannot stand well as before. I was advised to take her to the hospital but I will do that when the father sends money to us”

Yet, another participant explained:

“We have been told that the reasons our children are sick is because we do not give them food that contains protein. This is because all the sources of protein in this community have been destroyed by oil spillage and gas flaring. Our source of drinking water has been contaminated and the air we breathe has been polluted. For these reasons we and all our children cannot be well. It is a regrettable situation.”

The above go to confirm that indeed there are noticeable health problems that adversely affected children between the age of 1 – 10years of age as a result of oil spillage and gas flaring in the areas of study. The same findings go to confirm what Akinmoladen (1976), Greenpeace (1994), Human Right watch (1999), MOSOP (1992), Omoweh (1998) (2001) have observed in their different studies on oil and their effects on health.

CONCLUSIONS AND POLICY RECOMMENDATIONS

In conclusion, this study observed that oil exploration in Akwa Ibom and Delta States has caused very serious degradation to the human environment through oil spillage and gas flaring, specifically, children of age 1 – 10 years from these states have suffered from seven health problems due to high incidence of malnutrition. Thousands of members of

these communities have also died un-noticed as a result of adverse effect of environmental pollution. In the light of the above, the following policy recommendations are made to save the area from infant / child mortality:

- Since the petroleum industry has become the life-wire of the country's economy, and paradoxically the major source of hydrocarbon pollution in the oil producing communities, the industry should be encouraged to ensure the maintenance of enlightenment and sensitization programmes that would keep members of the communities constantly aware of the adverse effects of oil spillage and gas flaring on the environment. Oil companies should adhere to intentionally accepted standard oil field practices, so as to minimize spillages and flaring and their adverse consequences. The relevant legislations should be enforced, with attendant penalties on defaulting operators. Their optional plans should be regulated and strictly monitored to enforce compliance. Service companies should be encouraged to provide quick and satisfactory remedies in case of emergency.

The petroleum inspectorate department in the Ministry of Environment should enforce the implementation of approved guidelines so as to achieve the following:

- Reduce the quantity of contaminants in the effluent (Liquid or gases)
- Encourage plant operators to install and maintain process and pollution control equipment which represent the best practicable technology
- Reduce the quantity or volume of effluents; and
- Develop plant emission limits based on the capability and efficiency of the best practicable technology.
 - Nutrition Intervention Programme (NIP) should be introduced to address the problem of protein deficiency among the vulnerable children. There should be a collaboration between Government, Multi-National Companies and Non-Governmental Organizations to address the issue of health through proper intervention in medicine and balanced diets.
 - Appropriate compensation should be paid to members of these communities for being made to face these problems. Hospitals, Schools, good roads, Water, Electricity, etcetera should be provided free of charge to the affected communities to Cushion their socio-economic backwardness.

Put together, the recommendations suggested in this study to cushion the effects of environmental pollution from oil exploration may not be exhaustive, nonetheless, they constitute an important contribution to existing possible policy options for environmental improvement. If properly and realistically reviewed, integrated and applied, they would go a long way to enhancing improved living conditions for people living in Oil Producing Communities of the country in general and children of age 1-10 years old in particular.

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