Effects of Toxic Materials from the Exploration Activities of Transnational Oil Companies on the Environment of the Oil-Endowed States of Nigeria

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Abstract

The environment of the Oil-endowed States of Nigeria consists of highly diverse ecosystems that are supportive of numerous species of terrestrial, aquatic fauna, and flora. However, these ecosystems have been contaminated with toxic materials from oil exploration activities by Transnational Oil companies. While much attention is paid to Oil spills as the major pollutant, there are other toxic materials that have negatively impacted the environment of the oil endowed States. These toxic materials have not only endangered human and aquatic lives but have also destroyed arable lands. This article finds that the negative effects of toxic materials from oil exploration activities have resulted in poverty, land, air and water pollution, insecurity, health challenges, low crop yields and food insecurity. The article further finds that though there are in existence legal and institutional frameworks that can address the negative effects of toxic material pollution from oil exploitation activities, however, lack of enforcement of the extant legal frameworks and ineffective administration of the laws by the regulatory institutions have contributed to the incessant pollution of the environment of the oil endowed States with toxic materials. The article concludes that effective enforcement of the extant legal framework by the regulatory Institutions will address this challenge. The article recommends political will, regular capacity building, and adequate funding of regulatory institutions as measures to address the continuous pollution and its effects on the environment of these States. It suggests just transitions to renewable energy sources to ensure environmental justice and also promote sustainable development in the oil endowed States.

Keywords: Toxic Materials Pollution, Environmental Justice, Oil Endowed States.

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1. Introduction

Toxic material pollution arising from oil exploitation in the oil-endowed states of Nigeria has impacted negatively on biodiversity.[1] The oil endowed States refer to the part of Nigeria enveloped by the natural Delta of the River Niger and the areas to the East and West that also produce oil.[2] The cuts across the following zones, South-East, South–South and South-West regions of Nigeria. Presently there are nine (9) states out of the thirty-six States of Nigeria that are regarded as oil endowed States and they are, Akwa-Ibom, Rivers, Delta, Bayelsa, Cross River, Ondo, Abia, Imo and Edo States.[3] The environment of these States are contaminated with toxic materials from exploration activities of Transnational Oil Companies. The main sources of toxic materials pollution include oil spills, gas flaring, sludges, and the escape of other chemicals used during oil exploitation processes.[4] The negative effects of toxic material pollution have resulted in the destruction of the environment and the indigenous people suffer health-related challenges including respiratory issues, cancers, and birth defects. Many have lost basic human rights such as access to food, clean water, and their means of livelihood. [5]

The right to a healthy environment is considered fundamental to the enjoyment of the right to life.[6] This is evidenced by the provisions of section 20 of the Constitution of the Federal Republic of Nigeria 1999 as amended which makes it the responsibility of the State to protect and improve the environment. Though this section is considered unenforceable because it is contained in chapter 2 of the Constitution, which is non-justiciable, however, the judicial decision in *AG of Ondo State v AG of Federation*[7] the Supreme Court of Nigeria held that once an item in chapter 2 of the constitution is legislated upon that item becomes justiciable. Further, section 24 of

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1 Adesina, Temitayo Bello and Joseph Amadi, 'Oil Pollution and Biodiversity Conservation in Nigeria: An Assessment of Legal Framework' (2019) 7(8) *Journal of Geoscience and Environment Protection;*23.

2 The Niger Delta Development Commission (Establishment etc) Act 2000,.s. 1 and 2.

3 'States that Make up the Niger-Delta Region'<www.nigeriainfopedia.com> accessed 12 March 2018, see also The Niger Delta Development Commission (Establishment etc) Act 2000, Section 2

4 Olawale, Atanda, 'An Overview of the Legal Framework on Oil Pollution in Nigeria'<www.researchgate.net>accessed 19 May 2023.

5 Collins Ugochukwu and Jürgen Ertel, 'Negative Impacts of Oil Exploration on Biodiversity Management in the Niger Delta Area of Nigeria.' (2012) 26(2) *Journal of Impact Assessment and Project Appraisal*;139.

6 CFRN1999 as amended, s.33.

7 (2002) 9 NWLR pt 772.

the African Charter on Human and People's Rights (The African Charter)[8] which is domesticated in Nigeria provides that all peoples shall have the right to a general satisfactory environment favourable to their development. The Harmful Waste (Special Criminal Provisions) Act[9] also prohibits the illegal dumping of harmful waste on land and waters in Nigeria. Though these laws exist, the environment of the oil endowed States are still contaminated with toxic materials from oil exploitation activities as recently, the oil-endowed states recorded another oil spill in February 2023.[10] This is a shred of evidence that these laws are not effective in terms of implementation, enforcement, and monitoring by responsible institutions. Hence the need for reforms and the need for effective enforcement mechanisms that will deter TNOCs from continuous pollution of the environment of the oil-endowed states with toxic materials from Oil exploitation activities. The negative effects of toxic materials on the environment of Oil endowed states include: pollution, poverty, loss of agricultural produce and food insecurity, health-related challenges and insecurity, and environmental conflicts.[11] These effects are examined in this article with the aim of revealing the environmental and socio-economic problems, as well as the threat to human lives, resulting from reoccurring pollution of the environment of the Oil endowed States with oil-related toxic materials and the need to promote environmental justice and sustainable development in those states.

The article is divided into five sections to ease the flow, the next section after this introductory section discusses the concept of toxic materials, section three will analyse the effects of toxic materials from exploration activities of Transnational Oil Companies, section four will Address the effects of toxic materials through advocacy for environmental Justice and Sustainable Development in the Oil Endowed States**.** The fifth section will proffer recommendations and conclude the article**.**

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[8] African Charter on Human and Peoples' Rights (Ratification and Enforcement) Act, Cap A9 LFN 2004.
[9] Harmful Waste (Special Criminal Provisions etc) Act Cap H1 LFN 2004, s.1.
[10] Oladehinde, Oladipo, 'Shell Confirms Fresh Oil Spill in Ogoni land' Business Day 14 Feb. 2023 www.businessday.ng. accessed 20 May 2023.
[11] Ibid (n.5)

2. Toxic Materials: Meaning, Classification and Sources

This section will discuss the meaning, classification and sources of toxic materials.

2.1 Toxic Materials

The term 'Toxic Materials' does not have a definite definition and there are limited works of literature that have provided a definition of the term. One of the literature defined it as any substance that may pose a hazard to human health or the environment when improperly treated, stored or disposed of.[12]It is also referred to as any material that releases a chemical in sufficient quantities to kill cells either directly or indirectly through inhibition of key metabolic pathways.[13] They are also defined as substances that may cause harm to an individual if it enters the body.[14]Toxic materials'' refer to substances that are poisonous to the environment and living organisms.[15] From the definitions above, the researcher is of the view that toxic materials refer to those substances which are harmful to the environment and living organisms on the environment. In *R. v. Hydro-Québec*[16] the Canadian Supreme Court held that a substance is toxic where "it is entering or may enter the environment" under conditions "having or that may have an immediate or long-term harmful effect on the environment", "constituting or that may constitute a danger to the environment on which human life depends", or "constituting or that may constitute a danger in Canada to human life or health."

The Court further held that the protection of the environment, through prohibitions against toxic substances, constitutes a wholly legitimate public objective in the exercise of criminal law power. Protection of the environment is an international problem that requires action by governments at all levels.[17] Also in the United States Supreme Court case of Chemical *Waste Management*,

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[12] Carol, Webster. *Toxic and Hazardous Materials: A Sourcebook and Guide to Information Sources* (Greenwood, 1987).

[13] Muhammed Tawfiq Ladan, *Sustainable Development Goals, Climate Change and Extractive Resource Management in Africa* (Ahmadu Bello University Press Limited ,2017, Stephen Hanson, *et al. An Introduction to Materials in Medicine,* (Academic Press, 1999).

[14] Canadian Center for Occupational Health and Safety Toxic Materials- Hazards.' 8 Nov.2019.<www.ccohs.ca.> accessed 2 September 2020.

[15] Ibid.

[16] (1997) 3 S.C.R. 213.

[17] *R. v. Hydro-Québec* (1997) 3 S.C.R. 213 < www. scc-csc.lexum.com> accessed 12 December 2022.

Inc. *v*. *Hunt*,[18] toxic materials especially toxic waste was defined as substances that are inherently dangerous to human health and safety and to the environment. Such waste consists of ignitable, corrosive, toxic and reactive wastes which contain poisonous and cancer-causing chemicals, and which can cause birth defects, genetic damage, blindness, crippling and death.

Toxic materials are found in liquid, solid or gaseous form and may also be in form of waste or other substances. Toxic materials comprise toxic waste, hazardous waste, and harmful substances which though not waste but are harmful to the environment.[19] The term toxic material will serve as an umbrella name for toxic waste and hazardous waste /materials in this thesis. It is therefore pertinent to examine the meaning of toxic and harmful waste.The word toxic literarily means 'poisonous.**[20]** By extension, a poison is an agent that chemically destroys life or health upon contact with or absorption by an organism[21] "Waste" on the other hand means something which originally served a purpose, but is no longer useful, as for example, refuse.[22] They are things left over or are superfluous as excess materials or by-products that are no longer considered useful. The term waste is defined in article 1 (1) of the Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa[23] as 'substances or materials which are disposed of, or are intended to be disposed of, or are required to be disposed of by the provisions of national law.'

Toxic wastes are therefore dangerous substances capable of causing death or injury to life[24]. Toxic waste can be radioactive, explosive, carcinogenic (causing cancer), mutagenic (causing damage to chromosomes), teratogenic (causing birth defects), or bioaccumulative (that is, increasing in concentration at the higher

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18 *(*1992*)* 504 U.S. 334.

19 Ibid (n.13).

20 Victoria, Kalu,'Toxic Waste and the Nigerian Environment: An Appraisal' www.nigerianlawguru.comaccessed 5 February 2019.

21 Royal Society of Chemistry, 'What is Poison<'www.rsc.org.> accessed 22 September 2020.

22 William Blackman, *Basic Hazardous Waste Management* (Lewis Publishers, 1993).

23 'The Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa, 1991.' <www.lrct.go.tz/download/treaty-convention/bamako.pdf> accessed 12 January 2019, Basel Convention, Article 2, no. 1.

24 Goodman Helen. *Toxic Waste* (Alabaster Books, 2010).

ends of food chains.[25]Toxic waste is defined in the Basel Convention[26] as having poisonous effects if breathed in, eaten or absorbed by the skin. While armful waste is defined under the Harmful Waste (Special Criminal Provisions) Act of Nigeria thus:[27]''Harmful waste is any injurious poisonous, toxic or noxious substance and, in particular, nuclear wastes emitting any radioactive substance … as to subject a person to the risk of death, fatal injury or incurable impairment of physical or mental health'. The definition of toxic waste and harmful waste above is synonymous with the definition of toxic materials provided earlier in this chapter. The term toxic material is broader and encompasses both toxic waste and harmful wastes or substances.[28]

In the oil endowed States of Nigeria where oil exploitation takes place, there are identified toxic materials present in the environment which are mostly by-products of the petroleum industry. Other toxic materials present in the environment of the oil endowed States arebiocides, industrial solvents, and heavy metals. However, of interest to this thesis are the toxic materials from the petroleum industry. Toxic materials from by-products of petroleum are mostly chlorinated hydrocarbons such as DDT and the PCBs[29] which undergo slow microbial degradation and are present in sufficient concentration in many aquatic environments and severely affect the biota as well as the entire ecosystem. What constitutes toxic materials is legion though only a few have been mentioned above, it is important to state that the larger and common components of toxic materials are toxic waste.[30]

In 1989, an International Convention on the Control of the Transboundary Movement of Hazardous Wastes and Disposal was held at Basel, Switzerland (The Basel Convention)[31] and this

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[25] Beatrice Chaytor, and Manek Mita, *International Environmental Law and Policy in Africa. (*Springer, 2003)

[26] "The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal 1989, Annex III ,6.1.<www.basel.int.> accessed 5 February 2019.

[27] The Harmful Waste (Special Criminal Provisions) Act 1988, s. 15.

[28] Ibid (n.13)

[29] "Dichlorodiphenyl Trichloroethane and Polychlorinated Biphenyls are considered as toxic chemicals which are harmful to the environment. Toxic Free Future, PCBs and DDT.<www.toxicfreefuture.org.> accessed 18 November 2020.

[30] Environmental Health and Safety, 'List of Hazardous and Disposal contacts, List of Hazardous Materials and Disposal Contacts.' <www.ehs.research.uiowa.edu>.accessed 14 October 2020.

[31] 'The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal 1989. 'Annex I.'<www.basel.in> accessed 5 February 2019.

Convention adopted a similar approach to the principles adopted in the United States of America for the definition of hazardous wastes, which is an element of Toxic material.[32] The convention identified a total of 18 types of wastes listed in Annex 1 as toxic materials or waste streams and these include ;waste mineral oils unfit for their originally intended use, waste oils/water, hydrocarbons/water mixtures, emulsions, waste substances and articles containing or contaminated with polychlorinated biphenyls (PCBs) and/or polychlorinated terphenyls (PCTs) and/or polybrominated biphenyls (PBBs), waste tarry residues arising from refining, distillation and any pyrolytic treatment; wastes generated from heavy metal toxicants such as metal dusts; ignitable wastes; and heave metal solution etc.[33]There are also other toxic materials classified by the said Annex I of the Convention, but we shall be limited to the focus of this thesis.

Further, Annex 1 of the Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa also categorized Industrial waste i.e. such as waste emanating from refineries as hazardous, and in this thesis, we have established above that hazardous waste are elements of toxic materials.[34] The Convention in ANNEX 1 listed the categories of waste which are toxic/hazardous and they are: flammable, all wastes containing or contaminated by radionuclides, the concentration or properties of which result from human activity; Clinical wastes from medical care in hospitals, medical centres and clinics; Wastes from the production and preparation of pharmaceutical products; Waste pharmaceutical, drugs and medicines; Wastes from the production, formulation and use of biocides and phytopharmaceuticals; Wastes from the manufacture, formulation and use of organic solvents; Wastes from heat treatment and tempering operations containing cyanides; Waste mineral oils unfit for their originally intended use; Waste oils/water, hydrocarbons/water mixtures, emulsions; Waste substances and

[32] United States Environmental Protection Agency, 'What is Hazardous Waste' <www.epa.gov.> accessed 5 February 2019.
[33] Ibid (n.31).
[34] Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa,1998.

articles containing or contaminated with polychlorinated biphenyl (PCBs) and/or polychlorinated terphenyls (PCTs) and/or polybrominated biphenyl (PBBs); Wastes tarry residues arising from refining, distillation and any pyrolytic treatment; Wastes from production, formulation and use of inks, dyes, pigments, paints, lacquers, varnish; Wastes from production, formulation and use of resins, latex, plasticizers, glues/adhesives; Waste chemical substances arising from research and development or teaching activities which are not identified and/or are new and whose effects on man and/or the environment are not known; Wastes of an explosive nature not subject to other legislation; Wastes from production, formulation and use of photographic chemicals and processing materials; Wastes resulting from surface treatment of metals and plastics; Residues arising from industrial waste disposal operations; Wastes collected from households, including sewage and sewage sludges; Residues arising from the incineration of household wastes.

Annex II of the Bamako convention listed the characteristics of toxic materials and they are: Explosive: An explosive substance or waste is a solid or liquid substance or waste (or mixture of substances or wastes) which is in itself capable by chemical reaction or producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings.[35] Flammable liquids :The word "flammable" has the same meaning as "inflammable", Flammable liquids are liquids, or mixtures or liquids, or liquids containing solids in solution or suspension (for example paints, varnishes, lacquers, etc., but not including substances or wastes otherwise classified on account of their dangerous characteristics) which give off a flammable vapour at temperatures of not more than 60.5 degrees C, closed cup test, or not more than 65.6 degrees C, open-cup test, Flammable solids, or waste solids, other than those classed as explosives, which under conditions encountered in transport are readily combustible, or may cause or contribute to fire through friction, Oxidizing substances or wastes which, while in themselves not necessarily combustible, may, generally by yielding

[35] 'Corresponds to the Hazardous Classification System Included in the United Nations Recommendations on the Transport of Dangerous Goods.'ST/Secretary General/AC.10/1/Rev.5, United Nations, New York, 1988.

oxygen, cause or contribute to the combustion of other materials, organic peroxides Organic substances or wastes which contain the bivalent-0-0-structure are thermally unstable substances which may undergo exothermic self-accelerating decomposition, poisonous (Acute) Substances or wastes liable either to cause death or serious injury or to harm human health if swallowed or inhaled or by skin contact, infectious substances or wastes containing viable micro-organisms or their toxins which are known or suspected to cause disease in animals or humans. Corrosives Substances or wastes which, by chemical action, will cause severe damage when in contact with living tissue, or in the case of leakage, will materially damage, or even destroy other goods or the means of transport; they may also cause other hazards, toxic (Delayed or chronic) Substances or wastes which, if they are inhaled or ingested or if they penetrate the skin, may involve delayed or chronic effects, including carcinogenicity, exotoxic Substances or wastes which if released present or may present immediate or delayed adverse impacts to the environment by means of bioaccumulation and/or toxic effects upon biotic systems.[36]

The sources of toxic materials can broadly be categorized into two – human and natural.[37]However, human activities are the major source of toxic materials in the oil endowed States of Nigeria. This is as a result of exploitation activities and the chemicals used in the refineries, mining sites and industries.[38] The volume of toxic materials generated by these industries are frightening , considering the overall effects on the environment and the fact that most of these toxic materials which are considered as waste or by products of petroleum are untreated before disposal especially in a developing country like Nigeria where there is virtually little or no treatment and disposal regulations. Though, Nigeria has no nuclear industry for now, but her oil and gas industry is responsible for the generation of

[36] Annex I. 'Categories of Wastes Which Are Hazardous Wastes,' <www.wedocs.unep.org>accessed 20 March 2020.

[37] Cyril Uchenna Gwam. 'Human Rights Implications of Illicit Toxic Waste Dumping from Developing Countries including the U.S.A., Especially Texas to Africa, in Particular, Nigeria Symposium: Powering the Future: A 21st Century Guide for Energy Practitioners.' (2013)38 *Thurgood Marshall Law Review;*241.

[38] Ballenger, Green, 'Illusion of Sustainable Development: How Nigeria's Environmental Laws are Failing the Niger Delta,(2011)36(2) *Vermont Law Review*;387.

a very large volume of toxic materials found in the environment of the oil endowed states. [39]

Toxic materials can be classified into liquid, gases, solid, or sludge and contain chemicals, heavy metals, radiation, pathogens, or other materials.[40] Whether liquids or sludge they can be absorbed by the soil or seep into seas, rivers, and streams. While as gases they contaminate the atmosphere and as solids the also contaminate the soil because they are not biodegradable.[41] Toxic materials are very harmful to people, animals, and plants. Some toxins, such as mercury and lead from oil spill persist in the environment for many years and accumulate over time thereby damaging the environment. Poisoning occurs when toxic materials are ingested, inhaled, or absorbed by the skin.[42] Ending the dumping and pollution of the environment of the oil endowed States with toxic materials is key towards achieving a healthy ecology and sustainable development.

3. Analysis of the Effects of Toxic Materials from the Exploration Activities of Transnational Oil Companies

The effects of toxic materials of toxic materials on the environment are harmful, this is because toxic materials are hazardous to the environment and therefore negatively impact on the ecosystem. Toxic materials from oil exploration activities such as gas flaring, sludges and oil spills have led to land, air and water pollution, health issues, food insecurity, loss of arable land and insecurity. It is pertinent to examine some of the effects of toxic materials from exploration activities of Transnational Oil companies as this will help create the awareness on the dangers of oil exploration activities on the environment. Effects of toxic materials such as pollution, poverty, health related challenges, food insecurity and Insecurity will be examined in this section.

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[39] Felicia Anyaogu, and Ukooh David Ikoni, 'Towards the Strict Legal Enforcement of Best Practice Principles in Oil and Gas Exploration and Production in Nigeria'(2012)3 *Nnamdi Azikiwe University Journal of International Law and Jurisprudence;* 15.

[40] Ibid(n13).

[41] National Geographic, 'Toxic Waste Explained.'26 June 2019 <www.nationalgepgraphic.com> accessed 14 March 2020.

[42] Ramon, Aldag,'Toxic Waste'<www.britannica.com/science/toxic-waste>accessed 15 March 2020.

3.1 Pollution

The term 'pollution' refers to man-made or man-aided alteration or chemical, physical, or biological quality of the environment beyond acceptable limits.[43] The notable sources of toxic material pollution in the oil endowed States are oil spills and oil-related waste. [44] However, there are other toxic pollutants that are in form of anthropogenic emissions; atmospheric flaring and venting of petroleum-associated natural gas by TNOCs.[45] The release of petroleum hydrocarbons into the environment, whether accidentally or due to anthropogenic activities, is toxic to the environment and a major cause of land, air and water pollution.[46]

3.1.1 Land Pollution

Land pollution especially from toxic materials resulting from oil exploitation activities of the Transnational Oil Companies (TNOCs) is threatening food production in the oil endowed States of Nigeria.[47] These toxic materials which are usually from waste dumps, sludges, constant oil spills from oil exploitation activities of Transnational Oil Companies (TNOCs), or toxic wastes deposited on the earth's surface harm human health, water, and air quality. Land pollution from oil-related toxic materials are considered very hazardous to the environment and a major cause of land degradation this is evidenced the decision by a High Court in England in the case of *Bodo Community v. Shell Petroleum Development Company of Nigeria*.[48] The High Court in England held that oil spills by Shell Petroleum Development Company of Nigeria polluted the environment and also affected the source of livelihood of Bodo community.

The Food and Agricultural Organisation of the United Nations has stated that both intense and even moderate degradation is already affecting one-third of the world's soil and recovery is so slow that it

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[43] National Environmental Standard and Regulations Enforcement Agency Act 2007, S.37.
[44] Olujimi, Julius Ajilowo et al, 'Sources of Toxic Materials' (2011) 4(3) *Journal of Geography and Regional Planning*;110.
[45] Ibid (n.44)
[46] 1bid (n.44)
[47] Joseph Akpokodje and Shehu Salau,'Oil Pollution and Agricultural Productivity in the Niger Delta of Nigeria.'(2015)6(4) *Environmental Economics Journal*;68.
[48] (2014) EWHC TCC, Case No HQ11X01280, (2014) English High Court of Justice.

would take 1,000 years to create a 1-centimeter layer of arable soil.[49] An average of 240,000 barrels of crude oil are spilled in the oil endowed States of Nigeria every year, in large part due to unknown causes (31.85%), third-party activity (20.74%), and mechanical failure (17.04%).[50] The oil spills with other toxic materials that are deposited on the land during oil exploitation have contaminated water, air, vegetation, and agricultural land with a trace of harmful metals that have accumulated in crops and are considered to be carcinogenic in nature.[51] Toxic materials also have a negative impact on the health of the local residents of the oil endowed States, thus, ingestion, contact, and inhalation of constituents of spilled oil or other toxic pollutants have acute and long-term health implications. [52]Though the acute manifestations of the exposures are often transient, severe exposures can result in acute renal failure, *hepatoxicity*[53] and *hemotoxicity*,[54] birth defects even infertility and cancer.

Statistics have shown that toxic materials such as oil spills can lead to as much as a 60% reduction in household food security, reduce the ascorbic acid content of vegetables by as much as 36%, and can decrease the protein content of cassava by up to 40% if nothing is changed about current oil exploitation methods in the oil endowed States; this can potentially result in a 24% increase in the prevalence of childhood malnutrition.[55] Land degradation from toxic materials pollution will result in climate change which is a major cause of climate-related displacements and extinction of some animal species. It is estimated that internal displacement from climate-related disasters may result in the displacement of 50 to 700 million people

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[49] Intergovernmental Technical Panel on Soils. "Food and Agricultural Organisation of the United Nations, Status of the Worlds Soil Resources 2015." www.fao.org/.Accessed 20 January2023.

[50] Abonyi, Nichodemus. "Environmental Pollution and Associated Health Hazards to Host Communities (Case Study: Niger Delta Region of Nigeria)." *Central Asian Journal of Environmental Science and Technology Innovation*.Vol.1, 2020, p.30.

[51] Best, Ordinioha and Seiyefa ,Brisibe. "The Human Health Implications of Crude Oil Spills in the Niger Delta, Nigeria: An Interpretation of Published Studies." *Nigerian Medical Journal*.Vol.54, no.1, 2013, p.10.

[52] Ibid**.**

[53] Hepatotoxicity Implies Chemical-Driven Liver Damage**;** Jane Grochowski, 'Study Reveals Link Between Oil Spill Exposure and Hematologic and Hepatic Toxicity.' (2013)11*The American Journal of Medicine;*2.

[54] Hemotoxicity is a State of Toxic Damage to the Liver; Jane Grochowski, **"**Study Reveals Link between Oil Spill Exposure and Hematologic and Hepatic Toxicity*," (2013)11 The American Journal of Medicine;33***.**

[55] Gigi, Nwagbo. "Oil Pollution in Niger Delta." Stanford University, 5 June 2017 <www.large.stanford.edu>.accessed 21 June 2022.

by 2050.[56] Also, land contamination is one of the main causes that could trigger the sixth mass extinction in history especially as the population of land vertebrates fell by 38 % between 1970 and 2012.[57] Innovations that will promote alternatives to fossil fuels through renewable energy sources, environmentally friendly oil production mechanisms, recycling of oil-related waste, and proper disposal of oil-related toxic materials are necessary to eliminate soil/land pollution, guarantee an increase in food production as well as promote a sustainable environment in the oil endowed States of Nigeria.[58]

3.1.2 Air Pollution

One notable effect of toxic materials from activities of TNOCs is air pollution which is experienced in the oil endowed States of Nigeria.[59] In the famous South African 'Deadly Air Case' -*Trustees for the Timebeing of Groundwork Trust and Another v. Minister of Environmental Affairs and Others*[60] The South African High Court held that 'Air pollution knows no boundary and has potential to affect everyone, but it can affect us differently…children [the] elderly and those with respiratory diseases such as asthma, are the most vulnerable to air pollution… The most vulnerable groups…[tend] to lose if air pollution levels are not properly managed. This air pollution most times arises from gas flaring by Transnational Oil companies and despite the ban on unauthorized flaring, over 75% of the gas produced is still being flared despite the toxic nature of gas flaring on the environment.[61]

Gas flaring has been declared illegal in Nigeria since 1984 and through the decision in *Gbemre v. Shell Petroleum Development*

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[56] ICCDI Africa. "International Climate Change Development Initiative Africa." ICCDI Africa 20 May 2021 <www.medium.com.>accessed 9 August 2022.

[57] Abonyi, Nichodemus. 'Environmental Pollution and Associated Health Hazards to Host Communities Case Study: Niger Delta Region of Nigeria.'(2010) *Central Asian Journal of Environmental Science and Technology Innovation;*30.

[58] Temi Ologunorisa. 'A Review of the Effects of Gas Flaring on the Niger Delta.' (2001) 8(3) *Environment International Journal of Sustainable Development and World Ecology*;65.

[59] Ukpere, Daniel, Ojule Esher and Ottah Chikaezie. "Impacts of Air Pollution in the Niger Delta Region of Nigeria." *IIARD International Journal of Geography and Environmental Management.* (2018)4(4);13.

[60] Case No. 39724/19 (2019) High Court of South Africa (unreported) <awww.cer.org.za/wp.>accessed 22 November 2022.

[61] Oghenejoboh, Kigho Moses and Others., 'Effects of Air Pollution Arising from Associated Gas Flaring on the Economic Life of the People of Oil Producing Communities in Nigeria," (2020)33(3)J*ournal of Industrial Pollution Control*;34.

Company of Nigeria Ltd and Others.[62] In Gbemre's case, the Court held that gas flaring should be stopped. The reason is that it violates the rights to life and human dignity as constitutionally guaranteed by sections 33 and 34 of the 1999 Nigerian Constitution, and Articles 4, 16, and 24 of the African Charter on Human and Peoples Rights of 1981. Despite the decision in Gbemre's case above, Nigeria still ranks among the top 10 gas-flare countries.[63]

Authorities estimate the financial loss due to gas flaring to be close to $230 million during those months.[64] Gas flaring is associated with lots of dangers as it introduces toxic material pollutants such as sulfur dioxide into the atmosphere, which can lead to environmental problems such as acid rain, corrosion of metal roofs, and significant increases in concentrations of sulphates, nitrates and dissolved solids as well as the generation of greenhouse gases which contribute to global climate change.[65] When the burning of natural gas occurs in close proximity to wildlife or inhabited areas, the effects raise environmental and health concerns such as skin damage, lungs and liver damage, many respiratory diseases such as asthma, bronchitis and pneumonia.[66]

Gas flaring also affects agricultural productivity as the combustion process raises the soil temperature, which causes a decline in crop yield.[67] The smoke which emanates from the flares are considered to be very toxic in nature as they lead to black rainfall and water bodies which affect aquatic and Wildlife.[68] Gas flaring is often performed for economic reasons, as alternative disposal methods are more costly than the immediate elimination of the gas, which is a less profitable and potentially hazardous by-product of the industry

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[62] 6 AHRLR (2005) p. 152.

[63] With about 7.4 billion cubic meters of gas flared in 2018; about 425.9 billion standard cubic feet of gas flared in 2019 and between January to May 2021, 90.9 billion cubic feet of natural gas was lost due to gas flaring. International Climate Change Development Initiative Africa. 'End Gas Flaring NG: The Unspoken Dangers of Gas Flaring in Nigeria.' ICCDI Africa 20 May 2021. www.medium.com. Accessed 20 January 2023.

[64] NNPC,'Nigeria Lost N53.26bn to Gas Flaring in Two Months NNPC.'Economic Confidential, 22 Jul. 2021<www.economicconfidential.com/**>** accessed 2 August 2022.

[65] Anslem, Ajugwo, 'Negative Effects of Gas Flaring: The Nigerian Experience (2013)1(1)*Journal of Environment Pollution and Human Health*;p.6-8.

[66] Ibid.

[67] Elisha, Jasper Dung, Leonard Bombom and Tano Agusomu,'The Effects of Gas Flaring on Crops in the Niger Delta, Nigeria'(2008)4 *GeoJournal;* 297.

[68] Amadi, Akobundu,'Impacts of Gas Flaring on Quality of Rainwater, Ground Water and Surface Water in Parts of Easter Niger Delta Nigeria'(2014)2(3) *Journal of Geoscience and Geomatic;*80.

without regard to its toxic effects on the environment.[69] Data obtained from the Nigerian Gas Flare Tracker showed that 25.9 billion Standard Cubic Feet of gas, valued at N460.5 billion, were flared between January and November 2019.[70] The volume of gas flared is capable of generating 42,600 megawatts of electricity which would have helped solve the electricity problem of the country while ending the constant air and water pollution of the oil endowed States.[71]

3.1.3 Water Pollution

Water pollution is also one of the negative effects of toxic materials from exploitation activities of Transnational Oil Companies in the oil endowed States of Nigeria. [72] Water pollution caused by oil spillages and chemical discharges has led to surface and underground water pollution, the destruction of aquatic life and several health-related challenges among residents of these oil endowed States. [73]This has resulted from increased Chemical and Biochemical Oxygen Demand (COD and BOD) in the case of death of aquatic life, while diseases such as hyperactivity and risk of high blood pressure, heart attack, and stroke coupled with kidney problems have been reported in those States.[74] Food crops are also being contaminated and the reason is not far-fetched as the people consume the same toxic water since there is no other source of potable water for consumption[75].

Pollutants in form of emitted hydrocarbons caused by unburnt crude oil and partially burnt hydrocarbons are sources of water

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[69] American Association for the Advancement of Science,'Eyes on Nigeria: Gas Flaring.' American Association for the Advancement in Science News, 3 Jul. 2022. <www.aaas.org/.> accessed 2 August 2022.

[70] International Climate Change Development Initiative Africa,'End Gas Flaring NG: The Unspoken Dangers of Gas Flaring in Nigeria.' ICCDI Africa 20 May 2021.<www.medium.com/climatewed/endgasflaringng> accessed 20 January 2023.

[71] Ibid.

[72] Ayokunl, Fatubarin,'Developing A Clear-Cut Policy and Strategy for Oil Spill Response and Investigation Towards Promoting A Sustainable Ocean-based Economy In Nigeria' Nippon Foundation, 15 December 2015. <www.un.org> accessed 12 June 2022.

[73] Abosede, Omowumi Babatunde**,**'Oil Pollution and Water Conflicts in the Riverine Communities in Nigeria's Niger Delta Region: Challenges for and Elements of Problem-Solving Strategies' (2020)38(2) *Journal of African Studies*;274.

[74] John, Kanayochukwu Nduka and Orish Ebere Orisakwe, 'Water-quality Issues in the Niger Delta of Nigeria: A Look at Heavy Metal Levels and Some Physicochemical Properties' (2011)18 (2) *Environmental Science and Pollution. Research International;*237.

[75] Nduka, and Orisakwe, 'Water-quality Issues in the Niger Delta of Nigeria: A Look at Heavy Metal Levels and Some Physicochemical Properties' (2010) *Environmental Science and Pollution. Research International;*240.

pollution in these States.[76] Additionally, gases such as nitrogen oxides, tetraethyl lead, and carbon dust particles pose a problem to human health. Ground-level ozone accumulation and carbon-monoxide also cause respiratory problems.[77] As stagnant waters from wastelands expose the indigenes to malaria and other water-related diseases. Often, the problems manifest in cardio-vascular and neuro-behavioural deficiencies that may result to lung problems.[78]

One of the challenges facing the indigenes of oil endowed States is access to potable water. This is evidenced by the UNEP Report on the Environmental Assessment of Ogoni land[79] and the decision in *Center for Oil Pollution Watch v. NNPC*,[80] where the Supreme Court held that 'a contaminated water and impaired environment by noxious toxicant material such as crude hydrocarbon oil not only destroys the environment and the entire ecosystem, but it is also injurious to public health and human lives.'

It is commonly understood that one liter of wastewater pollutes eight liters of fresh water, thereby reducing twelve thousand cubic kilometers of the global water supply each year.[81] Therefore, improper disposal of toxic materials and oil spills have great potential to pollute most water sources in the oil endowed State leading to water scarcity, death of aquatic life, and environmental deprivation.[82]mThe importance of water that is free from all forms of contamination from toxic materials cannot be over-emphasized as it cuts across agricultural development, industrial growth, and human development. Safe drinking water and sanitation are indispensable to sustain life and health and fundamental to the dignity of all in the oil endowed State.

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[76] Abosede, Omowumi Babatunde**,** 'Oil Pollution and Water Conflicts in the Riverine Communities in Nigeria's Niger Delta Region: Challenges for and Elements of Problem-Solving Strategies.' (2018) *Journal of African Studies*, p.280.

[77] Abdullahi, Ahmed and Others . "Review of Nigeria's Effort to Stop Gas Flaring by 2020," p.127.

[78] Jerome, Nriagu and Others, 'Health Risk Associated with Oil Pollution in the Niger Delta, Nigeria.' (2016) 13(3);46.

[79] UNEP, 'Environmental Assessment of Ogoni Land 2011' <www.postconflict.unep.ch/>accessed 21 May 2022.

[80] (2018) LPELR-50830(SC) per Ejembi Eko, JSC (Pp. 130-152, paras. A-D).

[81] UNESCO Water Portal Weekly Newsletter No. 184: Wastewater, Apr. 13, 2007, at 4 cited in Richard A. Hughes, 'Pro-Justice Ethics, Water Scarcity, Human Rights.' (2015) 25 *Journal of Law and Religion*;13.

[82] Erik Cordes and Others, 'Environmental Impacts of the Deep-Water Oil and Gas Industry: A Review to Guide Management Strategies' (2016)5 *Journal of Environmental Science*;132.

3.2 Poverty

Poverty is another negative effect of the inappropriate disposal of toxic materials from oil exploitation activities of Transnational Oil Companies on the environment of the Oil Endowed State. In September 2022, the National Bureau of Statistics (NBS) published that 133 million Nigerians are poor and this exceeded World Bank Projection for Nigeria in 2022.[83] A report by the Socio-Economic Rights and Accountability Project (SERAP) on 28 September 2022 revealed how "communities in the Niger Delta continue to live in depressing and deplorable conditions, despite the fact that the wealth derived from their environment is the main economic mainstay for the country.'' The report identified a linkage between poverty and the environment.[84]

The nexus between poverty and the environment has raised some debates. The debate dates back to the 18th century, when Thomas Malthus argued that because of the burden of their inherent economic handicap and disadvantage, the poor "seldom think of the future" and consequently continually and heedlessly degrade their natural resource base and put their environment under perpetual jeopardy, pressure, and stress.[85] Mahatma Gandhi has been reported to have echoed Malthus's assertion by concluding that "poverty is the greatest cause of environmental harm."[86] This is evidenced by the fact that the resultant effect of Oil exploitation is pollution which leads to the loss of arable land and negatively impacts farming which is the major source of livelihood in the oil endowed States of Nigeria. It is imperative to state that before oil was discovered the oil endowed States of Nigeria had a landmass covering mangrove forests, brackish swamp forests, and rainforests.[87] The States had abundant fish resources, widespread forests, and agricultural lands

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[83] National Bureau of Statistics. 'Nigeria Launches its Most Extensive National Measure of Multidimensional Poverty' 17 Nov. 2022.<www.nigerianstat.gov.ng> accessed 6 January 2023.

[84] SERAP, 'Communities in Niger Delta live in Depressing Conditions-SERAP, 28 Sept.2022 <www.serap-nigeria.org.> accessed 6 January 2023.

[85] Thomas, Malthus. *An Essay on the Principle of Population.* Penguin Classics,1985, p.5.

[86] Amokaye Oludayo, *Environmental Law and Practice in Nigeria (*University of Lagos Press,2004).

[87] Amarachi, Paschaline Onyen and Kabari Sam, 'A Review of the Threat of Oil Exploitation to Mangrove Ecosystem: Insights from Niger Delta Nigeria (2020)22 *Global Ecology and Conservation*;1-22.

for sustainable agriculture which made farming and fishing the common occupation of the indigenes.[88]

However, with the discovery of oil and constant pollution of the environment of these States with toxic materials from exploitation activities the indigenes have been deprived of a healthy environment as well as their means of livelihood leading to a lot of negative impacts both on the environment and lives of the residents of these States.[89] Thus, in the Indian decided case of *Indian Council for Environ-Legal Action v. Union of India*[90] the Supreme Court of India held that sludge mixed with oil was responsible for damage to soil, crop, and trees and contaminated the environment of the affected community and the productivity of their land.

Poverty resulting from continuous environmental degradation has led to numerous socio-economic impacts and is considered to be multi-dimensional contributing to most of the agitations in the Oil endowed States.[91] Some of the identified socio–economic impacts of poverty[92] include; conflict, vandalism of oil facilities, Oil theft, kidnapping, terrorism, food shortage, hunger, destruction of traditional authorities and sacred worship centers, destruction of traditional means of livelihood and unemployment, loss of income and damage of fisheries and wildlife.[93] Considering the various socio-economic impacts of poverty and the laws tackling them are ineffective, the result is violence, loss of agricultural produce /food insecurity, remarkable negative impact on the economy and development of these States.[94] Addressing these socioeconomic impacts of poverty will help in achieving environmental justice in the oil-endowed states of Nigeria.

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88 Olanike Kudirat Adeyemo and Others, 'Oil Exploitation, Fisheries Resources and Sustainable Livelihood in the Niger Delta, Nigeria' 14 June 2020 <www.fao.org/> accessed 21 June 2022.

89 Ibid.

90 AIR (1996) 1446, SCC (1996) 3, 212 JT 1996 (2**).**

91 Joseph, Ebegbulem and Others, 'Oil Exploration and Poverty in the Niger Delta Region of Nigeria: A Critical Analysis.' (2013)(4)3 *International Journal of Business and Social Science*;279; Ikechukwu Dialoke, and Marshall Edeja. 'Effects of Niger Delta Militancy on the Economic Development of Nigeria (2006-2016) (2017) 3(3) *International Journal of Social Sciences and Management Research*;25.

92 Ibid.

93 Ibid.

94 Eloamaka, Okonkwo, 'Oil Spills in Nigeria: Are There Social and Economic Aspects?' (2014)12014 *International Oil Spill Conference Proceedings;*156.

3.3 Loss of Agricultural Produce and Food Insecurity

Agriculture has been a significant part of the culture and sustaining force of the rural people in the oil endowed States of Nigeria,[95] but since the discovery of crude oil in commercial quantity, these States have suffered the loss of their agricultural produce.[96] This is because of the resultant pollution arising from oil exploitation in the oil endowed States. In a jurisdiction like India, it has been accepted that the resultant effect of Oil Pollution is the loss of agricultural produce. Hence, the Indian Supreme Court held in the decided case of *Shetland Seafarms Ltd & Anor v. International Oil Pollution Compensation Fund & Ors*[97] that oil pollution can result in loss of agricultural produce.

The task of improving agricultural productivity in the oil endowed States is a critical factor in tackling food insecurity as water and land resource have become increasingly limited, and has been made difficult by exposure of the environment to toxic materials through incessant oil spillage in those States.[98] Crude oil exploitation has replaced earnings from agriculture which used to be the mainstay of the nation's economy.[99] The oil sector generates over 90% of the nation's foreign exchange earnings and over 80% of annual government revenue Consequently, less attention was accorded to the agricultural sector which is the source of livelihood of the populace.[100] Food production over the years continued to decline in the oil endowed States which exposed the people to the dangers of food insecurity.[101] Besides the low performance of the agricultural sector, the presence of toxic materials which made the lands infertile further exacerbates the problem of low agricultural productivity.[102]

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[95] Ekanem, Jemimah and Nwachukwu Ike, 'Sustainable Agricultural Production in Degraded Oil Producing and Conflict Prone Communities of Niger Delta.'(2015)8 (1) *Nigeria Journal of Agriculture and Sustainability*;14.

[96] Adati, Ayuba Kadafa, 'Oil Exploration and Spillage in the Niger Delta of Nigeria' (2012)2(3) *Civil and Environmental Research*.; 39.

[97] SCOTT (2005) CSIH 8.

[98] Ibid (n.51).

[99] Nseabasi, Akpan,'From Agriculture to Petroleum Oil Production: What Has Changed about Nigeria's Rural Development?' (2012)1(3) *International Journal of Developing Societies*;.97.

[100] Binuomote, Samuel Olanrewaju and Kehinde Odeniyi. 'Effect of Crude Oil Price on Agricultural Productivity in Nigeria 1981-2010.' *International Journal of Applied Agricultural and Apicultural Research* (2013).9 (1,);131.

[101] Ibid.

[102] Onwuchekwa Raphael Iheke and Others, "Effects of Oil Spillage on Productivity of Farmers in River State, Nigeria,"*International Journal of Agriculture and Development Studies* (2019) 4 (1); 23.

Toxic materials resulting from oil exploitation have become a great menace to the environment threatening crop yield, land degradation killing fishes and other seafood.[103] Furthermore, the emission of toxic gases into the environment usually causes natural disasters such as desertification and flood which contributes to the loss of agricultural produce and food insecurity.[104] *Odjuvwuederhie Inoni, Douglason Omotor and Adun Felicia Nkem*[105] in their research revealed that pollution of the environment with Oil related toxic materials has led to unprecedented economic deprivation and underdevelopment and has over decades, impacted disastrously on farmlands massively threatening food security and the peasant economy of the people in Delta State.[106] With continuous oil exploitation activities by TNOCs, Essien and John,[107] observed that farmlands in the oil endowed States will continuously be polluted with toxic materials resulting in a decrease in agricultural output.[108] Kinigoma, revealed that activities such as drill cutting, barites and bentonite clays dumped on the ground prevents plant growth and results in low agricultural yield and food insecurity.[109]

3.4 Health-related Challenges

There are quite a lot of health challenges that have been recorded[110] from contamination of the environment with toxic materials discharged during oil exploration/ exploitation activities and oil spills by Transnational Oil Companies (TNOCs).[111] These toxic materials are said to have acute and long-term effects on human

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[103] Chijioke, Basil Onuoha, Ebong, Itoro Bassey and Henry Ufomba, 'The Impact of Oil Exploration and Environmental Degradation in the Niger Delta Region of Nigeria: A Study of Oil Producing Communities in Akwa Ibom State' (2018) 18(2) *Global Journal of Human-Social Science*;58.

[104] Ibid.

[105] Odjuvwuederhie Inoni et al 'The Effect of Oil Spillage on Crop Yield and Farm Income in Delta State, Nigeria' (2016)7(1) *Journal of Central European Agriculture*;71.

[106] Ibid.

[107] Essien, Obot Essien and John Anthony, 'Impact of Crude-Oil Spillage Pollution and Chemical Remediation on Agricultural Soil Properties and Crop Growth' (2010)14(4) *Journal of Applied Sciences and Environmental Management;*147.

[108] Ibid.

[109] Kinigoma, Samuel. "Effect of Drilling Fluid Additives on the Niger Delta Environment: A Case Study of the Soku Oil Fields." *Journal of Applied Sciences and Environmental Management.* Vol.5, no.1,2001, p.57.

[110] Ibid (n.51).

[111] Ajayi, TR and Others, 'Natural Radioactivity and Trace Metals in Crude Oils: Implication for Health.' (2009)31 *Environ Geochemistry and Health*; 61; Edema NE, Obadoni BO, Erheni H, Osakwuni UE, 'Eco-phytochemical Studies of Plants in a Crude Oil Polluted Terrestrial Habitat Located at Iwhrekan, Ughelli North Local Government Area of Delta State.'(2009)7 *Natural Science.*;49; Ordinioha Best, Sawyer W. 'Acute Health Effects of a Crude Oil Spill in a Rural Community in Bayelsa State, Nigeria.' (2010)19 *Nigerian Journal of Medicine;*14.

health.[112] Thus, in the earlier mentioned South African 'Deadly Air Case', [113] the High Court of South Africa held that air pollution is a threat to life.

Known carcinogens like *bezo (a*) *pyrene* and *polycyclic aromatic hydrocarbon (PAH)* were, respectively, found in the surface water and soil of Ughoton stream in Niger Delta.[114] Like other known carcinogens, they do not have any safe levels, as even a few molecules of these can be toxic to human and animal health. The difference in the concentration of these carcinogens in the air was given as a reason for the higher prevalence of certain types of cancers seen in River State compared with what is found in a State like Oyo which is not an oil endowed State.[115]Research has also revealed that petroleum-related toxic materials from exploitation activities of TNOCs could cause a 45 percent increase in the normal background radiation level.[116] This is another carcinogenic danger that could manifest as increased prevalence of certain cancers years after oil exploitation activities and oil spills.[117] The radiation contamination caused by toxic materials discharge and oil spills are often so widespread that the surface water and crops grown in the impacted environment are also contaminated beyond the maximum permissible limit.[118]

The ingestion, dermal contact, and inhalation of the other constituents of toxic materials discharge or oil spills could result in respiratory disorders such as bronchitis and asthma.[119] It could also lead to acute renal failure,[120] or even *hepatoxicity* which is a state of

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[112] Ibid (n.51).

[113] *Trustees for the Time Being of Groundwork Trust and Another v Minister of Environmental Affairs and Others* Case No. 39724/19 (2019) High Court of South Africa (unreported)< www.cer.org.za/wp>accessed 22 November 2022.

[114] Uzoekwe, S.A., Achudume A.C, 'Pollution Status and Effect of Crude Oil Spillage in Ughoton Stream Ecosystem in Niger Delta' (2011)3 *Journal of Ecology and the National Environment;*469.

[115] Ana, G.R., Sridhar M.K.., and Asuzu M.C,'Environmental Risk Factors and Hospital-Based Cancers in Two Nigerian Cities' (2010)2*Journal of Public Health Epidemiology;*.216.

[116] Agbalagba, O.E., and Meindinyo R.K., 'Radiological Impact of Oil Spilled Environment: A Case Study of the Eriemu Well 13 and 19 Oil Spillage in Ughelli Region of Delta state, Nigeria.' (2010)3 *Indian Journal of Science and Technology*;1001.

[117] Meindinyo, R.K, and Agbalagba E.O, 'Radioactivity Concentration and Heavy Metal Assessment of Soil and Water, in and Around Imirigin Oil field, Bayelsa State, Nigeria.' (2021)4 *Journal of Environmental Chemistry and Ecotoxicology*; 29.

[118] Osuji, L.C, and Achugasim O, 'Trace Metals and Volatile Aromatic Hydrocarbon Content of Ukpeliede-I Oil Spillage Site, Niger Delta, Nigeria.'(2010)14 *Journal of Applied Science and Environmental Management*;17.

[119] *Trustees for the Time Being of Groundwork Trust and Another v Minister of Environmental Affairs and Others* Case No. 39724/19 (2019) High Court of South Africa (unreported).

[120] Otaigbe, B.E,and Adesina A.F, 'Crude Oil Poisoning in a 2-year-old Nigerian: A Case Report." (2005)6 *Anil Aggrawal's Internet Journal of Forensic Medicine and Toxicology*;66.

toxic damage to the liver,[121] *hemotoxicity* which is toxicity that destroys the red blood cells, diarrhea, and birth defects.[122] Injections of these toxic discharges are prevalent in the oil endowed States because the indigenes of these states are predominantly subsistence farmers and fishermen who consume their farm produce and the fish from the polluted environment.[123] The concentrations of lead in the surface water and food crops exposed the children in the impacted communities to health challenges like iron deficiency, anemia, an increase in systolic blood pressure, kidney failure, and bone diseases in adults. [124] Rice, Sacco and Hyder, in their study, revealed that toxic materials discharged from oil exploration activities and oil spills affect soil fertility and also result in the reduction of the quantity and quality of food available to households in the impacted communities. This could result in an up to 24% increase in the prevalence of childhood malnutrition, food insecurity and insecurity in the Oil endowed States of Nigeria.[125]

3.5 Insecurity and Environmental Conflicts

Conflicts in the Oil endowed States of Nigeria have been occurring since the discovery of oil.[126] These conflicts have been attributed to the negative impact of toxic materials from oil exploitation in these States.[127] The Oil endowed States of Nigeria may be considered to be a tale of poverty, squalor, and underdeveloped in the midst of plenty, due to environmental degradation which has affected the people's agricultural means of livelihood.[128] The effect of toxic materials such as oil spills, gas flares and discharge of toxic materials during Oil exploitation activities of Transnational Oil companies have been attributed to

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[121] Adesanya, O.A and others,'Spermatotoxic Impact of Bonny Light Crude Oil (BLCO) Ingestion on Adult Male Swiss Albino Mice' (2009)4 *International Journal of Physical Science*;349.

[122] Ibid

[123] Ibid (n.117).

[124] Nogawa K, Kobayashi E, Okubo Y, 'Environmental Cadmium Exposure, Adverse Effects and Preventive Measures in Japan. (2004)17 *Biometals Journal*; 581.

[125] Rice, A.L and Others, 'Malnutrition as an Underlying Cause of Childhood Deaths Associated with Lead Poisoning and Infectious Diseases in Developing Countries.*' (2000)78 Bull World Health Organ;*1207.

[126] Ajaero, C.K and Others, 'The Drought-migration Nexus: Implications for Socio-Ecological Conflicts in Nigeria.' (2015) 6(2) *Mediterranean Journal of Social Sciences*; 470.

[127] Alao, Abiodun, *Natural Resources and Conflict in Africa:The Tragedy of Endowment* (*Rochester NY*, University of Rochester Press,2001) .

[128] Gleditsch, Nils and Henrik Urdal. 'Ecoviolence Links Between Population Growth, Environmental Scarcity and Violent Conflict' (2002)56(1) *Journal of International Affairs.*

death of aquatic lives, infertility of farm lands and health challenges. It is on record that more gas is flared in Nigeria than anywhere else in the world[129]. Nigeria is the second largest offending country, after Russia, in terms of the total volume of gas flared and the resulting emission of about 70 million tons of CO2 a year.[130]

In the case of oil spills, Ajodo-Adebanjoko, Angela and TakimOjua stated in their research that Nigeria has the highest number of oil spills in the world; between 9 million and 13 million barrels of oil have been spilled in the Oil endowed States.[131]The Nigeria National Petroleum Company (NNPC) places the quantity of petroleum spilled into the environment yearly at 2 300 cubic metres, with an average 300 industrial spills annually.[132] The World Bank however believes that the amount of oil spills could be ten times higher than the officially released figures.[133] Erosion, canalisation, and intra and inter-communal conflicts between host communities and Transnational Oil Companies are also some effects of oil exploitation in the oil endowed States. [134]This has led to protests and full-blown conflicts.

Alao Abiodun[135] revealed in his research that from the early 1990s till 2000 more conflicts were recorded in Ogoni land. These conflicts are a result of the degradation of the environment from discharge of toxic materials from exploration and exploitation activities of Transnational Oil companies and oil spills.[136] The decided Case of *Ken Saro-Wiwa v. The Attorney-General of Federation and Ors*[137] was the first case of agitation on

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[129] Worgu, Owabukeruyele,' Hydrocarbon Exploitation, Environmental Degradation.' Paper presented January 2000 at Lund University, Sweden; World Bank 2003. World Development Indicators 2002. CD-ROM. Washington, D.C, World Bank.< https://documents1.worldbank. org/>accessed 15 June 2022.

[130] Amanze, Ejiogu, 'Gas Flaring in Nigeria: Costs and Policy." *Energy and Environment Journal.* Vol 24, no.6,2013, p.983.

[131] Ajodo, Adebanjoko, Angela and Takim Ojua. 'An assessment of Niger-Delta crisis on Nigeria's external Relations - From 1992–2008' (2013)8(3) *International Journal of Humanities and Social Science*;179.

[132] Amadi, A.N. and Others, 'Environmental Geochemistry and Heavy Metal Assessment in Soils, Surface and Groundwater from Eastern Niger-Delta, Nigeria Using Multivariate Pollution Indices.' (2016)2(2) *International Journal of Science for Global Sustainability*;15

[133] Lelia Croitoru and Others, 'The Cost of Coastal Zone Degradation in Nigeria: Cross River, Delta and Lagos States' World Bank Documents 2020, p.29.

[134] Ako R, 'The Struggle for Resource Control and Violence in the Niger Delta. In: Obi, C. and S.A. Ristadeds. *Oil and Insurgency in the Niger Delta: Managing the Complex Politics of Petro-violence*' (New York Press, 2011,2 Ed Books);22.

[135] Alao Abiodun, 'Natural Resources and Conflict in Africa: The Tragedy of Endowment' (University of Rochester Press, 2007); 21.

[136] Ibid.

[137] 3PLR/1995/49 (CA).

environmental damage resulting from oil exploitation activities. After this series of conflicts, a new wave of conflicts characterised by militancy began in 2003.[138] The militancy period was characterised by armed attacks, bombing of oil installations, and hostage-taking, particularly of foreign oil workers of Transnational Oil companies.[139] During these period, the Oil endowed States were characterised by insecurity; and at the height of the crisis, the situation was dreaded by Nigerian citizens and foreigners alike.[140]These conflicts persisted because the indigenous people were demanding for compensation, restoration of their land from damaging effects of toxic materials such as the re-occurring oil spills and gas flaring, development of the States as well as control of the oil wealth.[141]

In 2009, the Federal Government of Nigeria interceded with an amnesty programme under former President Musa Yar'adua and his deputy, Goodluck Jonathan.[142] The amnesty, which was proposed to last for five years, required that repentant militants surrendered their arms in return for unconditional national pardon. This exercise witnessed a total of 26 808 militants surrendering their arms and ammunition and being granted amnesty, which involved co-opting or integrating them into the society as well as training them.[143]While amnesty lasted, there was some reprieve as militants sheathed their swords. In recent times, there has been there are new wave of conflicts as new militant groups emerged in 2016 with various demands.[144] The demands of this group of militants include restoration of the ecology of their environment that has been damaged by toxic materials from petroleum exploitation activities, end to Oil spills and resource control by the indigenous people.

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[138] Ajodo and Ojua, 'Assessing Amnesty programme in the Niger Delta in the Face of Renewed Militancy in the Region.' (2016)4(1)*Nasarawa Journal of Political Science;*150.

[139] Ibid.

[140] Phenson Ufot Akpan. 'Oil Exploration and Security Challenges in the Niger-Delta Region: A Case of Akwa Ibom State, Nigeria.*'(*2014)*2 Journal of Research & Method in Education.*;41.

[141] Davis, James, 'Getting it Right: Searching for the Elusive Solution in the Niger Delta' (2016) 4(1) *Cornell International Affairs Review*;46.

[142] Ejovi, Austine and C. Sunday Ebie, 'Niger Delta: A Critical Appraisal of the Amnesty Programme and Social Political Development in Nigeria' (2013)3 *Research on Humanities and Social Sciences*;130.

[143] Ajodo, and Ojua, 'Assessing Amnesty Programme in the Niger Delta in the Face of Renewed Militancy in the Region' (2016) 15.

[144] Ibid.

Insecurity and environmental conflicts are still ongoing, this is evidenced from threats made by a group of militants to attack all oil installations in the Oil endowed States of Nigeria if their demands are not met.[145]Part of their demands is to restore their environment that have been damaged by toxic materials from exploitation activities and Oil spills.[146] The President reacted swiftly to the threats and promised to look into their demands to avert further insecurity that may arise as the militants are known for carrying out their threats.[147] The activities of these militants have left the oil endowed states immersed in insecurity challenges.[148]

4. Addressing the Effects of Toxic Materials through advocacy for Environmental Justice and Sustainable Development in the Oil Endowed States

The harmful effects of toxic materials from Oil exploration activities on the environment of the oil endowed states cannot be overemphasized. Continuous pollution of the environment of oil endowed states may be akin to genocide on the Oil endowed states hence the need to address the root cause of environmental damage. It is noteworthy that Oil exploration activities of Transnational Oil Companies (TNOCs) are the major cause of environmental damage and loss of biodiversity in these States, hence the call for environmental justice and sustainable development.

Environmental Justice refers to the fair treatment and meaningful involvement of all people regardless of race, colour, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.[149]The term fair treatment means that no group of people, including racial, ethnic, or socio-economic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial

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[145] Eklavya, Gupte, 'Niger Delta Militants Threaten to Resume Attacks on Nigeria's Oil Installations' Global Press 28 Jun 2021 **<**www.spglobal.com/> accessed 28 June 2022**.**

[146] Gupte O "Niger Delta Militants Threaten to Resume Attacks on Nigeria's Oil Installations" (Global Press ,2021**)**

[147] Terhemba, Daka. 'I have responded to Demands, Threats Pointless, Buhari tells Niger Delta Militants.' The Guardian Newspaper 28 June 2021.< www.guardian.ng/news/> accessed 28 June 2022.

[148] Ibid (n.143).

[149] United States of America Environmental Protection Agency, 'Environmental Justice primer for Ports: Defininf Environmental Justice'< https://www.epa.gov>accessed 12 June 2023.

operations or the execution of federal, state government policies or the activities of private individuals and companies. This implies that all human are entitled to equal protection and equal enforcement of basic human rights and this includes environmental rights. It is important to state that the oil endowed states have a right to a healthy ecology as they cannot enjoy the constitutional right to life in an environment polluted with toxic materials. There is need to advocate for sustainability especially for future generations in those States.

The concept of sustainability helps to foster understanding of benefits of environmental protection on human and aquatic lives. While it is not wrong to benefit from natural resources, there should be need to promote ensure sustainable use, hence the call for sustainable development which is the development that meets the need of the present without compromising the ability of future generations to meet their own need.[150] Therefore, effective enforcement of sustainable policies and laws driven by principles of environmental justice will to a great extent, ameliorate the present unpleasant situation of economic lack, poor health, strife and decay in oil endowed States.

5. Recommendations

This section will highlight the recommendations and conclude the research.

The author has discussed the effects of toxic material pollution on the environment of the oil endowed States and proffers the following recommendation. The study, therefore, recommends the following: reform of the archaic laws like the Harmful Waste (Special Criminal Provisions) Act to include effective sanction mechanisms that will deter TNOCs from polluting the environment of the oil endowed States of Nigeria with toxic materials, fast-track the implementation of the Ogoni Clean-up exercise in line with the United Nations Environment Programme's (UNEPS) report of 2011, adequate funding of the regulatory institutions to prevent regulatory capture and training of Judges, prosecutors and investigators on

[150] Sustainable Development Goals, 'The Sustainable Development Agenda' https://www.un.org/sustainabledevelopment/development-agenda/ accessed 14 July 2023

evidence gathering on environmental matters. Effective implementation of the recommendations proffered above will help mitigate the negative effects of toxic material pollution on biodiversity and help achieve environmental justice in the oil-endowed States of Nigeria.

6. Conclusion

This article examined the negative effects of toxic material pollution from Oil exploitation activities of Transnational Oil Companies (TNOCs) in the oil endowed states of Nigerian. The effects of toxic material pollution on the environment of the oil endowed States have led to biodiversity loss, health challenges, insecurity, loss of means of livelihood of the people, and the degradation of the ecosystems. Invariably, these impacts negate the principle of sustainable development The study of these effects reveals the constant violation of the right to a healthy environment of indigenous people leaving in the oil endowed States of Nigeria. Though there are in existence legal and institutional frameworks that can address the negative effects of toxic material pollution from oil exploitation activities, however, lack of enforcement of the extant legal frameworks and effective administration from the regulatory institutions have hindered the need to end the incessant pollution of the environment of the oil endowed States with toxic materials. The article has proffered effective measures that should be adopted by the regulatory institutions to end toxic material pollution, promote environmental justice and sustainable development in oil endowed states.