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ENVIRONMENTAL REMEDIATION MANAGEMENT IN NIGERIA: A LEGAL REVIEW OF OIL SPILLS REMEDIATION IN THE NIGER DELTA REGION

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ABSTRACT

Environmental quality and its sustainability of resources are vital to the general well-being and advancement of the people of the Niger Delta Region of Nigeria. This is credited to the fact that over 70 percent of the people of the Niger Delta Region of Nigeria rely on the natural environment for survival. The environment serves as a source for agriculture, forest products and fishing. The rivers and creeks are used for washing, bathing and it is a main source for drinking. The paper revealed that since the discovery of oil in 1956 by the Shell British Petroleum (now Royal Dutch Shell) at Oloibiri, a village in the present day Bayelsa State of Niger Delta Region, the Region has persistently suffered the destructive environmental effects of unsustainable oil production. Between 1976 and 1996 a cumulative of 4647 oil spills occurrences caused the oil spills of about 2,369,470 barrels of crude oil into the environment. Additionally, between 1997 and 2001, Nigeria witnessed an aggregate quantity of 2,097 oil spills occurrences. Shell Petroleum Development Company (SPDC) of Nigeria has recorded oil spills of almost 3.038 billion barrels of crude oil between 2003 and 2012 from their pipelines alone. This has impacted negatively on the Niger Delta Region environment and their source of livelihood. Several environmental remediation management policies have been initiated to lessen the danger of oil spills occurrences in the country. Yet, the Niger Delta Region of Nigeria is currently today, a classic international example of an adversely degraded environment occasioned by unsustainable oil operations in the region. The paper adopts analytical and qualitative approach and builds its argument on existing literatures which is achieved by synthesizing of ideas. It concludes that environmental remediation management in the Niger Delta Region of Nigeria with particular focus on oil spills remediation is capable of addressing the environmental and developmental issues currently facing the people of the Niger-Delta region. The paper amongst others, recommends that oil companies operating in the Niger Delta Region should in collaboration with the Nigerian Federal Government embark on immediate comprehensive environmental clean-up and remediation of polluted areas in the Niger Delta Region.

Keywords: Oil spills, oil pollution, environmental degradation, oil spills remediation, Niger Delta Region, Nigeria

1. INTRODUCTION

Generally speaking, it should be noted that the oil industry easily comes to mind whenever environmental problems are discussed in Nigeria. This is because the Nigerian oil industry generates up to 90% of the internally generated revenue and believed to account for a larger percentage of environmental problems in Nigeria, particularly within the oil producing region of Nigeria.[1] The Niger Delta Region of Nigeria has been defined as encompassing the South-

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South geopolitical zone of Nigeria, encompassing Edo State, Delta State; Bayelsa State; Rivers State; Akwa lbom State; and Cross River States, as well as other adjoining oil-producing States such as Ondo State, Abia State and Imo State.[2] Notably, Niger Delta Region symbolizes a friendly interaction between the people and the environment. The region situates at the coastal area of Southern Nigeria and is regarded as the world's second biggest Delta, as well as Africa's largest wetland which amongst others the third around the globe.[3]

Oil mining in the Niger Delta Region has caused severe degradation to the environment, owning to long-lasting decades of oil spills, absence of environmental regulations and ineffective implementation of environmental laws.[4] The rich bio-diversity of the Niger Delta Region is threatened by unsustainable oil and gas extractive activities. This, one of Africa's greatest sensitive bio-diversity hotspots has lost an enormous part of its protected regions in the last five decades due to these stresses.[5] Besides being a major contributor to the nation's petroleum resources,[6] the Niger Delta Region is regarded as one of the most closely populated African areas, similarly serving as habitat to some very uncommon species. Furthermore, it is regarded as the richest State in Nigeria with abundant mineral resources, and several natural ecosystems, supportive of various kinds of terrestrial and water-living organisms. In this sense, it should be noted that these primeval natural resources have suffered countless devastations owing to oil exploration and exploitations that has persisted in recent years with great impact on the host communities with a long-term devastating effects on the environment.[7]

It is important to emphasize here that the United Nations Development Programme (UNDP) Human Development Report for the Niger Delta Region (2006) revealed that the continuous flaring of gas has tremendously affected the environment causing a wide spread poverty and starvation in spite of over 95% revenue generated from the sale of crude oil and above 40% of GDP in Nigeria, the oil host communities still suffered from neglect and marginalization. While it is clear that within the context and circumstances surrounding oil exploration and exploitation activities in the Niger Delta Region, it must be emphasized that several Oil Pollution Impact Assessment Studies are of the view that a great percentage of oil pollution matters in the Niger Delta Region adversely impacted on the inhabitants as well as their means of livelihood.[8] In this instance, it may be argued that in searching for sustainable

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[1]Elenwo E. I. and Akankali J. A., 'Environmental Policies and Strategies in Nigeria Oil and Gas Industry: Gains, Challenges and Prospects'. *Natural Resources* [2014] (5) 884-885; See Idoko Timothya, Sodiki Johnb and Nkoi Bariyima, 'A Novel Method to Improve Oil Spill Cleanup in Niger Delta Region of Nigeria'. *International Journal of Applied Sciences: Current and Future Research Trends (IJASCFRT)* (2022) (13)(1) 152; See Antai Emmanuel E., Daniel Tamunodukobipi T. and Igboanusi Chinemerem, 'A Framework for Investigating Marine Environmental Pollution and Implementation of Control and Preventive Measures for Oil Spillages in Akwa Ibom State'. *The International Journal of Engineering and Science (IJES)* [2021] (10)(4) 54.

[2]See Ikenna V. Ejiba, Simeon C. Onya and Oluwadamilola K. Adams, 'Impact of Oil Pollution on Livelihood: Evidence from the Niger Delta Region of Nigeria'. *Journal of Scientific Research & Reports* [2016] (12)(5) 2.

[3]Anochie Uzoma C. and Onyinye O Mgbemena, 'Evaluation of Some Oil Companies in the Niger Delta Region of Nigeria: An Environmental Impact Approach'. *International Journal of Environment and PollutionResearch* [2015] (3)(2) 16.

[4]Elenwo and Akankali (n 1) 884-885.

[5]IUCN Niger–Delta Panel, 'Sustainable Remediation and Rehabilitation of Biodiversity and Habitats of Oil Spill Sites in the Niger Delta: Main Report including Recommendations for the Future' (July 2013) A Report by the Independent IUCN–Niger Delta Panel (IUCN–NDP) to the Shell Petroleum Development Company of Nigeria (SPDC) (Gland, Switzerland, IUCN, 2013).

[6]Okhumode H. Yakubu, 'Addressing Environmental Health Problems in Ogoniland through Implementation of United Nations Environment Program Recommendations: Environmental Management Strategies'. *Environments* [2017] (4) 1-2.

[7]Ibid; See Kabari Sam, 'Contaminated land management policy transfer: Drivers and barriers within the Nigerian context'. *African Journal of Environmental Science and Technology* [2022] (16)(9) 320-321.

[8]IUCN Niger–Delta Panel (n 5).

solution to the present pollution matters,[9] there is need for an effective and implementable environmental remediation management in the Nigerian Niger Delta Region.

2. OIL SPILLS INCIDENCES IN THE NIGER DELTA REGION OF NIGERIA

Oil spills in normal context means a situation where the liquid petroleum hydrocarbon is disposed into the environment through human activities[10] which is construed as a global phenomenon with attendant effects on the environment where it occurred.[11] In light of the above development, it should be noted that the Niger Delta Region environment has experienced several oil spills which the article further revealed that a total of 9,107 oil spills were documented between 1976 and 2005 alone.[12] While between 2003 and 2007, the SPDC alone documented 1,243 oil spills.[13] Indeed, this very point is noted as an obvious weakness, which no doubt, has exposed the inhabitants of the Niger Delta Region to all forms of environmental hazards. Therefore, in substantiating the foregoing observations, the paper submitted that these oil spill matters contribute to the discharge of crude oil into the environment, with its attendant consequences resulting to destructions of the ecosystem. In most instances, it should be noted that an average of 3,121,909.8 barrels of crude oil was discharged into the environment between the period of 1976 and 2005.[14] Also, it is respectfully submitted that, approximately 70 percent of the discharged oil cannot be recovered.[15] Although, the question remained as to whether these oil spills are caused by sabotage or oil production related activities. That said, it may be argued that this does not matter to the environment as it has a corresponding effects.[16] As the National Oil Spill Detection and Response Agency (NOSDRA) recorded about 2,400 oil spills within the period of 2006-2010, the question has always been, to what extent has the Government been able to address this intractable problem? In a similar vein, the paper also notes that in the year 2012, the New York Times reported that an average of 260,000 barrels of crude oil is spilled annually in the past 50 years of oil exploration activities in the Niger Delta Region of Nigeria.[17]

Apparently, it is generally acknowledged that a major oil spills which led to the discharged of barrels of crude oil into rivers, creeks and farmlands occurred in 1970 in the region of Ogoni land South-East, Nigeria. Moreso, as if that was not enough, in July 1979, about 570,000 barrels of crude oil was discharged by the SPDC's Forcados tank 6 Terminal in

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[9]Ibid.

[10]Ayokunle Fatubarin, Developing A Clear-Cut Policy And Strategy For Oil Spill Response And Investigation Towards Promoting A Sustainable Ocean-Based Economy In Nigeria (The United Nations Nippon Foundation Fellowship Programme, 2015) 57.

[11]Christopher Basharu Obida, 'Human and Environmental Exposure to Hydrocarbon Pollution in the NigerDelta: A Geospatial Approach' (PhD Thesis, Lancaster University, 2020) 10.

[12]Nwilo P. C and Badejo O. T., Impacts and management of oil spill in Nigerian coastal environment, Conference Proceedings, International Conference on the Nigerian State, Oil Industry and the Niger Delta, Organized by the Department of Political Science, Niger Delta University, in Collaboration with the Centre for Applied Environmental Research, Department of Geosciences, University of Missouri Kansas City, USA, March 11-13, 2008, Yenagoa, Bayelsa State, Nigeria, p.1222.

[13]SPDC (Shell Petroleum Development Company), 'SPDC and the Niger Delta: The environmental perspective' Paper presented at SPDC Oil Seminar for Academics, November 5-6, 2008, Port Harcourt, Nigeria.

[14]Nwilo and Badejo (n 12).

[15]Adeyemo A. M., 'Environmental policy failure in Nigeria and the tragedy of underdevelopment of Niger Delta Region' Inaugural Lecture No. 63, 2008, University of Port Harcourt.

[16]See generally, Oil Spills in the Niger Delta: Reflections and Concerns on JIV and Community Interests. National Coalition On Gas Flaring and Oil Spills in the Niger Delta (NASCGOND) JIV Policy Brief 2015, p.3 <www.stakeholderdem ocracy.org> accessed 15 January 2023.

[17]Victor Abaecheta Akujuru, A Framework for Determining the Compensable Value of Damages due to Contamination to Wetlands in the Niger Delta of Nigeria (PhD Thesis, University of Salford, 2014) 30-31.

Delta state that led to the contamination of the aquatic environment and several swamp forest.[18] The Texaco Funiwa No.5 Well in Funiwa Field spilled out about 421,000 barrels of crude oil into the ocean between 17th-30th January 1980 damaging 836 acres of mangrove forest within six miles off the shore. In addition, the Oyakama oil spills which occurred in May 1980 spilled about 30,000 barrels of crude oil into the environment.[19] An oil spills of 5,000 barrels of crude oil from Ebocha-Brass (Ogada-Brass 24) Pipeline that flooded the entire lake and swamp forest occurred in August 1983 in Oshika village of Rivers State, Nigeria. The Ogada-Brass pipeline oil spills close to Etiama Nembe in February 1995 discharged about 24,000 barrels of crude oil that completely covered the freshwater swamp forest and the brackish water mangrove swamp have their attendant consequences on inhabitants of the region.[20]

The SPDC since 1989 documented an estimated 221 oil spills annually in its operating region comprising 7,350 barrels of crude oil yearly. From 1976-1996 a cumulative of 4,647 oil spills occurrences discharging nearly 2,369,470 barrels of crude oil into the environment of which 1,820,410.5 (77%) was not recovered. Drawing from the above development, it is pertinent to note that a greater percentage of these oil spills that occurred in the Niger Delta Region happened on land, swamped or at the offshore environment. In this respect, it must be emphasized that the Nigerian National Petroleum Corporation (NNPC) estimated about 2,300 cubic meters of oil spills in 300 distinct occurrences annually between the periods of 1976-1996. On the other hand, in February 20, 1991 the Punch Newspaper reported a total of 2,796 oil spills occurrences recorded between the periods of 1976-1990 which resulted to about 2,105,393 barrels of crude oil spilled.[21] According to UNDP, between the periods of 1976-2001, three (3) million barrels of crude oil were lost in 6,817 oil spills of which more than 70% of the spilled oil was not recovered.

Also, in 2001 the Western Operations of the SPDC reported a total of 115 occurrences of oil spills in which 5,187.14 barrels of crude oil were spilled and 734,053 barrels of crude oil spilled signifying 14.2% were recovered. In January 1998, 40,000 barrels of crude oil was spilled by Mobil in Eket and in January 1980 an offshore well blowout spilled almost 200,000 barrels of crude oil into the Atlantic Ocean emanating from an oil facility that destroyed over 340 hectares of the mangrove forests.[22] The NOSDRA reported a total of 822 oil spills incidence in 2020 and 2021, resulting in the release of 28,003 barrels of oil into the environment.[23] The Nigerian Oil Spill Monitor, reported about 1152 oil spills incidence in 2023 which leaked 19,219,315 barrels of oil into the environment.[24] The NOSDRA reported a total of 168 incidence of oil spills between January and August 2023, which released 5,520 barrels of crude oil into the Niger Delta Region's environment.[25]

However, the devastating and dreadful impacts of environmental pollution caused by oil spills as portrayed by the United Nations Environment Programme (UNEP) report of 2011 on the attendant effects on Ogoni land established that, for more than 50 years, there has been

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[18]Kadafa A A, 'Environmental Impacts of Oil Exploration and Exploitation in the Niger Delta of Nigeria'. *Global Journal of Science Frontier Research Environment & Earth Sciences* (2012) 12(3) 18-19.
[19]John Onwuteaka, 'Hydrocarbon Oil Spill Clean-up and Remediation in the Niger Delta'. *Journal of Geography, Environment and Earth Science International* (2016) 4(3) 1, 2-3.
[20]Ibid.
[21]Ibid, 3.
[22]Ibid.
[23]Melissa Denchak, 'Water Pollution; Everything You Need to Know' (Natural Resources Defense Council, 2023) <https://www.nrdc.org/stories/water-pollution-everything-you-need-know> accessed 7th May 2024; Shell pipeline spill fouls farms, river in Nigeria's Niger Delta (26 Jun 2023) <https://www.aljazeera.com/news/2023/6/26/shell-pipeline-spill-fouls-farms-river-in-nigerias-niger-delta> accessed 6 November 2024.
[24]Nigerian Oil Spill Monitor, Oil Spill Data Summary for Year 2023 <https://nosdra.oilspillmonitor.ng/> accessed 6 November 2023.
[25]Ope Oluwani Akintayo, 'FG loses N335m to oil spill, says report' *Punch Newspaper* (7 September 2023).

a continuous oil pollution of land and water resources in the Niger Delta Region ranging from oil exploration to production. It is on this basis, and as demonstrated above, that it may be argued that it may likely take up to 25 or 30 years for normalcy to return back to the affected areas.[26]

3. MANAGEMENT OF OIL SPILLS REMEDIATION IN THE NIGER DELTA REGION OF NIGERIA

So far, the sorry history of the situation in the Niger Delta Region has not been accompanied by a notable improvement in terms of oil spill remediation.[27] The NOSDRA estimated in 2021 that over 92 percent of crude oil-contaminated sites remained unremediated, with minimal scheduled clean-up.[28] This however, has led to the problem of environmental degradation caused by oil exploration, mining and production which has made life unbearable for the people of the region.[29] It is worth highlighting that the key oil production-related environmental problem that has posed great danger to the entire Niger Delta Region environment is oil spillage. Oil spills pollution has resulted in the destruction of farmlands and rivers and thus, drastically altered the economic life of the once reliant and productive Niger Delta Region.[30] It is also noted that oil spills posed an instant risk to the environment and required immediate, fast, and detailed responses whenever it occurred. In this regard, the remediation of oil spills has to do with getting rid of the oil so as to abate the damage it may likely result to the environment. Given the attendant effects of the oil spill on the environment, it is essential to begin the clean up exercise immediately on the affected areas so as to reduce the harmful effects on the aquatic life as well as on the inhabitants of the region adversely affected.[31] While recognizing that some improvements could be made to the law prohibiting oil spills that result to the destructions of the environment and aquatic life, the Nigerian laws and regulations outlines the following procedures as a proactive measures capable of tackling environmental damages or pollution caused by oil spills as follows: clean-up of areas affected by oil spills, remediation of oil spills impacted areas; payment of financial compensation for damages; and other aspects of remedies.

3.1. Clean-Up of Oil Spills Impacted Areas

In this segment of the paper, the issue of who bears the burden of the oil spills clean-up exercise as well as who is responsible for the act of vandalism or sabotage raises a fundamental constitutional question relating to the application of the existing laws as between the government and the oil prospecting company. A look at the provisions of the law would reveal that the oil companies concerned are under obligations to contain (control the flow of), clean-

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[26]Akujuru (n 17); See Egbo W. Mansi and Egbo M. Esther, 'Bioremediation: A Strategic and Sustainable Technique for the Remediation of the Hydrocarbon Polluted Environment of the Niger Delta'. *IIARD International Journal of Geography and Environmental Management* [2018] (4)(4) 46.

[27]See Ogomudia Report: Report of the Special Security Committee on Oil Producing Areas Submitted to the President of the Federal Republic of Nigeria, Chief Olusegun Obasanjo, GCFR on Tuesday 19th February 2002 (Community Defence Law Foundation, 2007) 21-22.

[28]Margaret A. Adeniran, Michael A. Oladunjoye and Kennedy O. Doro, 'Soil and groundwater contamination by crude oil spillage: A review and implications for remediation projects in Nigeria' *Frontiers in Environmental Science* [2023] (11) <https://www.frontiersin.org/journals/environmental-science/articles/10.3389/fenvs.2023.1137496/pdf > accessed 5 November 2024.

[29]See Ogomudia Report: Report of the Special Security Committee on Oil Producing Areas Submitted to the President of the Federal Republic of Nigeria, Chief Olusegun Obasanjo, GCFR on Tuesday 19th February 2002 (Community Defence Law Foundation, 2007) 21-22.

[30]Otega Okinono and Danni Salleh., 'Nigeria Niger Delta: Innovation for Sustainable Development'. *Asia Pacific Journal of Education, Arts and Sciences* [2015] (4)(4) 41, 43.

[31]Egbe R. E. and Thompson D., 'Environmental Challenges of Oil Spillage for Families in Oil Producing Communities of the Niger Delta Region'. *JHER* [2010] (13) 30-31.

up and remediate the affected region (return the area to its previous state). Under the Nigerian law, the operating oil companies has the duty to clean-up the oil spills, and clean-up is expected to be equally immediate and applied good practice standards required. According to the Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN), issued by the Department of Petroleum Resources (DPR), it is clear from the foregoing provisions that clean-up must begin within hours of the incidence of the oil spills. EGASPIN furthermore specify that for all waters, there shall be no noticeable sheen after the first 30 days of the occurrence of the oil spills irrespective of the volume of the oil spills.[32]

It is to be noted, however, that clean-up is a remedial proactive approach adopted by the NOSDRA Act[33] to cushion the effects of the oil spill as well as ensuring that any oil operator who spills oil or petroleum product on the environment, should as a matter of urgent necessity clean-up the environment. By extension, Section 5(c) of the NOSORA Act empowers the NOSDRA to institute the machinery to monitor and help or where convenient direct the response, as well as the ability to marshal the required resources to save lives, safeguard threatened environment and clean-up to the best practical degree of the affected site.[34] In view of section 6(3) of the NOSDRA Act, among other things, the oil company can be held accountable for failure to clean-up the site that was adversely affected by the oil spill as a form of remediation. In essence, non compliance with the above provisions shall attract an additional fine of one million naira by the defaulting company.[35] Moreover, under Section 9(1)(j) of the NOSDRA Act, the entire responsibilities of the NOSDRA in respect to monitoring the clean-up activities of the oil company in remediation exercise guarantees the agency full powers to ensure total rehabilitation of the regions impacted.[36]

In that context, the clean-up, among other arguments, pointed out that it isa very good remedy for victims of environmental pollution. Also, it is not disputed that if there is an oil spills, and the spill is not evacuated within a reasonable time, there is a tendency that it may likely result to a serious damage to the environment. On the basis of considerations such as these, the paper revealed that most of the impacted locations that were neglected in the evacuation exercise or the evacuation exercise was not carried out within an expected period of time often times rendered the environment or impacted areas useless.[37]

3.2. Remediation of Oil Spills Impacted Areas

From all the above considerations it follows, according to the provisions of the NOSDRA Act, that oil companies are under obligations to remediate the impacted locations. This implies that impacted locations are to be brought back to its original state.[38] Drawing on the above, it needs to be noted that remediation implies a process of reinstating soil, water or air functionalities that was in existence prior to its contamination.[39] Undoubtedly, the decision that a site needs

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[32]Nigeria: Petroleum, Pollution and Poverty in the Niger Delta. Amnesty International June 2009 Report, p.65 <https://grupos.es.amnesty.org> accessed 1 July 2018.

[33]National Oil Spill Detection and Response Agency (NOSDRA) (Establishment) Act 2006 (hereinafter, NOSDRA Act).

[34]Ibid, section 5(c).

[35]Ibid, section 6(3).

[36]Ibid, section 9(1)(j).

[37]See generally, Abdulkarim Ibrahim, Assessment of the Legal and Institutional Framework for the Prevention of Environmental Degradation by Oil and Gas Companies in Nigeria (PhD Thesis, Faculty of Law, Ahmadu Bello University, Zaria: Nigeria, 2014) 87-88.

[38]Nigeria: Petroleum, Pollution and Poverty in the Niger Delta (n 32).

[39]Stanley Ngene and Kiran Tota-Maharaj, Environmental technologies for remediation of contaminated lands in the Niger Delta region of Nigeria: Opportunities for ecosystem services to host communities. p.4<https://uwe-repository.worktribe.com/output/1779177/environmental-technologies-for-remediation-of-contaminated-lands-in-the-niger-delta-region-of-nigeria-opportunities-for-ecosystem-services-to-host-communities> accessed 15 April 2023.

remediation is dependent on combined examinations by the oil companies and the regulatory agencies on the foundation of degrees of total petroleum hydrocarbon and chemicals of concern. Nevertheless, it has been noted that oil companies frequently have substantial control over the procedure, while the regulatory responsibilities has often been restricted to a proper evaluation of data offered by companies instead of independent evaluation of the oil-impacted areas or investigation. In the context of evaluation mechanism, it may flow from this argument that there is no mechanism on ground that will guide the communities on proper demands for an evaluation of the impacted locations and these has led to undocumented and improper examinations of statistical data analysis provided by oil companies. Given the hazards posed by oil spills, in 2007, the NOSDRA visited locations that oil companies suggested remediation exercise in order to ascertain the extent of damages on the impacted locations.[40]

Having said the above, would it be possible to submit that NOSDRA's efforts in this regard have been able to address the procedural version of the remediation principle? That said, it may be argued that remediation is, thus, an essential procedure both for the environment and for the protection of human rights. In other words, it must be emphasized that following evidence of both past and present failures in connection to procedural approach to remediation of polluted land and water in the Niger Delta Region has been as a result of State failures to address the ugly situations.[41] It is worthy of note that the State needs to demonstrate that it has an obligation to secure the substantive rights of its citizens as well as their environment. This indeed, was a crossroad moment for the people of the Niger Delta Region. A case in point is *Shell Petroleum Development Company Limited v. Councillor F B Farah & Ors*.[42] In this case, the pollution activities happened in 1970 and remediation procedure was completed in 1973/74. The plaintiff/respondent had real knowledge of the condition of the land in 1988 when the same was handed over to him. He realized that restoration and rehabilitation of the contaminated land were grossly inadequate and below the minimum standard which ultimately led to low crop yield and thus, brought an action for damages.[43] The plaintiff/respondent was awarded the sum of N4, 621,000.00 million by the trial judge which was affirmed on appeal by the Court of Appeal.[44] This appears to be more an instance of remediation of impacted areas by the polluter which is in tandem with the concept of polluter pays principle that implied a polluter of environment or the person responsible for the pollution should be liable for the cost of pollution and or the consequential lost.[45]

3.3 Payment of Financial Compensation for Damages Resulting from Oil Spills

Drawing on the nature of the polluter pays principle indicated above, it needs to be noted that whenever oil pollution occurred, those whose properties and lives are impacted are entitled to compensations from the polluter. As with several other facets of the oil industry's response to pollution, the emphasis is on oil spills. Although, there are two distinct ways of compensating an aggrieved person who suffered from such lost: One is done through judicial approach, while the other is a non-judicial approach. It should be noted that a non-judicial approach entails both parties' agreement on a compensatory amount to be paid on the lost incurred by the aggrieved communities and/or individuals by the oil companies, without approaching the Court. Given the above development, this procedure is adopted principally in situations of oil spills that is

[40]Nigeria: Petroleum, Pollution and Poverty in the Niger Delta (n 32).
[41]Ibid.
[42]*Shell Petroleum Development Company Limited v. Councillor F B Farah & Ors* [1995] 3 NWLR (Pt 382) 148.
[43]Ibrahim (n 37) 98.
[44]Aliyu Panti Isa, Legal Remedies for Victims of Environmental Pollution in Nigeria (Masters' Thesis, Ahmed Bello University, Zaria: Nigeria, 2014) 49-50.
[45]Ibid, p.60; See Amokaye O. G., *Environmental Law and Practice in Nigeria* (University of Lagos, 2004) 10.

based primarily on the provisions of the Petroleum Act,[46] the Oil Pipelines Act (OPA);[47] Nigerian Minerals and Mining Act (NMMA),[48] as well as on Part VIII of the EGASPIN. On the other hand, the judicial approach entails a situation where the aggrieved party seeks a redressing Court, basically to claim damages over the lost incurred as a result of the negligent act of the oil company which led to the destructions of his properties.[49]

Notably, while section 11 of the Oil Pipelines Act obliged oil companies to pay compensation to any aggrieved party who suffered from the damage resulting from oil spills arose from the breakage of or leakage of the oil pipeline or an ancillary installation aside from an act of sabotage of the oil pipeline caused by a third person,[50] the idea in this regard is to guide against fraudulent and fictitious claims. This is reasoning is clearly demonstrated by the Court of Appeal when it confirmed the provisions of the Oil Pipelines Act in the case of *Nigerian Agip Oil Company Ltd v Mr Onyemaechi Ogbu*,[51] where it stated that an aggrieved person under the Oil Pipelines Act who has a claim for damages caused must strictly ensure that he or she complied with the provisions of the Act and also the claim must be for compensations and not damages or any other relief. The Court further stated that, in as much as the Oil Pipelines Act takes precedence over the Common Law remedies, every action associated with or relating to damages or injuries arising from oil explorations, productions; installations; and other associated activities must be in compliance with the Oil Pipelines Act, which provides only for compensations to be paid to only persons who suffered lost or damages and not for any other claims.[52]

Further, in the case of *Umudje & Anor. v. SPDC*,[53] the crude oil collected and kept in a pit under the control of SPDC escaped onto the adjoining land of the plaintiffs where it damaged his fishpond and lake. The plaintiffs filed a suit seeking 'fair and reasonable compensation' of waterways and oil spills. The trail Court held in favour of the plaintiffs. The Supreme Court of Nigeria (SCN), confirming the decision of the Trial Court, held that the defendant oil companies were strictly liable to pay compensations to the Plaintiffs. In a similar vein, and in the case of *Elf v. Opere Sillo*,[54] bordering on the dumping of silt and mud from oil operations that polluted land and water, the Court awarded compensation to the plaintiff for loss of fishing rights due to oil pollution. What may be interesting to note is that reasoning applied by the Court in *Umudje & Anor v. SPDC* was an inspiration in the case of *EIF v. Opere Sillo*.

Given that the basis of the legality of the question on compensations is rooted on the

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[46]Cap 350 LFN 1990.

[47]Cap O7 LFN 2004.

[48]The Nigerian Minerals and Mining Act, 2007. This Act, pursuant to section 161 repealed the Mineral and Mining Act, Cap M12 LFN, 2004.

[49]Ibid; Clause 37 of the Petroleum Act, Clause 6(3) & Clause 11(5) of the Oil Pipelines Act, Clause 21(2), Clause 23 of the Petroleum (Drilling and Production) Regulations and Part VIII of the Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (EGASPIN) all provides for the payment of fair and adequate compensation to victims of pollution by the polluting oil companies.

[50]See section 11(5)(c) of the Oil Pipelines Act; Theresa O. Okenabirhie, 'Polluter Pays Principle in the Nigerian Oil and Gas Industry: Rhetorics or Reality?'. *CEPMLP Annual Review (Environment and Social Issues in Energy Industry)* [2009] 14.

[51]See Court of Appeal, Port Harcourt Division in Appeal No. CA/PH/387/11: *Nigerian Agip Oil Company Ltd v. Mr Onyemaechi Ogbu* [2017] (11) WRN/CA/PH/387delivered on Tuesday the 25th day of July 2017.

[52]Emmanuel Opara, Nigeria: a claim under the pipelines act must be for compensation and not damages (20 November 2018)<https://www.mondaq.com/nigeria/oil-gas--electricity/756510/a-claim-under-the-pipelines-act - must-be-for-compensation-and-not-damages> accessed 15 March 2023.

[53]*Umudje & Anor. v. SPDC*[1975] 9-11 SC 155; See Megan S. Chapman and Lawrence B. B Dube, *After Bodo: Effective Remedy & Recourse Options for Victims of Environmental Degradation Related to Oil Extraction in Nigeria* (Centre for Environment, Human Rights, and Development (CEHRD) 2015) 18.

[54]*Elf v. Opere Sillo*[1994] 6 NWLR (Pt 350) 258.

polluters pay principle, the Nigerian Minerals and Mining Act[55] provides for the payment of monetary compensation for damage and pollution in its Section 125(a)[56] by obliging a licensee or leases to pay compensation to the owner occupier; (a) whose land or interest in the land is injuriously affected by the existence of a right conferred by the licence or lease for any such injurious effect not otherwise made good and who suffers damage due to pollution of any source of water use for domestic and other purpose as a result of explorations or operations of any work associated with the property, for any such damage not otherwise made good. The basis for such compensations is the way the polluters pay principle is construed and as well can be utilized by the victims who suffered from environmental pollution matters.[57]

Similarly, the Petroleum Industry Act 2021 (PIA 2021) also provides for financial contributions for remediation of environmental pollution. It is also worth mentioning that Section 103 of the PIA 2021 requires that as a condition for the grant of a license or lease and before the authorization of the environmental management plan, the licensee or lessee is expected to pay an approved financial contribution to an environmental remediation fund for the restoration or management of adverse environmental effects of the petroleum activity. In light of the above section, it can be said that the financial contributions will first of all consider the extent of the work to be done as well as the degree of environmental threat that it might pose in the circumstances.[58]

3.4 Other Aspects of Remedies for Oil Spills

Though clean-up is essential when oil spills happen, mainly large-scale oil spills, communities may similarly be in requirement of instant support in terms of access to shelter, water, food and health-care. According to the National Oil Spill Contingency Plan (NOSCP) for Nigeria, Revised 2010, the Nigerian Federal Government would through the Federal Ministry of Lands, Housing and Urban Development mobilize human and equipment resources to vacate impacted human communities to safer grounds and construct temporary to semi-permanent structures and shelters for the resettlement of victims. It can be said that the National Emergency Management Agency[59] in this regard is statutorily empowered to carry out its role of supplying relief materials to persons in needs should the situation arises. In a similar fashion, the Federal Ministry of Water Resources on its own part should make adequate provisions of bore holes for water supply as well as making available other emergency water supply outlets as a cushion measure.[60]

More so, the Federal Ministry of Agriculture and Rural Development on its own part should in the event of an oil spills disaster, make provisions for food and relief materials, and also make available agricultural tools and other inputs to settle fishermen who may have been put out of business by the pollution of fishing regions by oil. The Federal Ministry of Health would set up medical outposts near the place of the event to provide medical treatment to the impacted communities, mobilize medical personnel, drugs and other relief materials to check epidemic, observe the impact of the oil spills on the overall health of the community, monitor for likely epidemic of new health situations that might be as a result of the occurrence of the oil spills which adversely destroyed the drinking water of the inhabitants. Considering the

[55]Cap M12 LFN, 2004.
[56]Nigerian Minerals and Mining Act, 2007.
[57]Isa (n 44) 40-41.
[58]Petroleum Industry Act 2021, section 103(1) & (2) (hereinafter, PIA Act 2021).
[59]The National Emergency Management (Establishment, Etc.) Act Cap N34 LFN 2004 (NEMA Act) establishes the National Emergency Management Agency (NEMA). NEMA is responsible for formulating policies on activities relating to disaster management and coordinating plans and programmes on response to disasters (natural and otherwise) in Nigeria. See NEMA Act 2004, sections 1(1) & 6(1)(a).
[60]National Oil Spill Contingency Plan (NOSCP) for Nigeria Revised 2010, pp. 36, 39, 40-41 <www.giwacaf.net >pdf >plan_ng_en> accessed 1 July 2023.

health consequences of the polluted waters, providing a potable water supply as well as providing restorative measures to cushion the effects of the environmental pollution matters will serve as a quick response mechanism.[61]

4. OIL SPILLS ENVIRONMENTAL REMEDIATION MANAGEMENT AGENCIES IN NIGERIA

4.1 National Oil Spills Detection and Response Agency (NOSDRA)

As the NOSDRA was enacted by the NOSDRA Act in 2006[62] as a deliberate and articulate response by the Nigerian Federal Government to the persistent environmental degradation and devastations of the coastal ecosystem in the oil producing area of the Niger Delta Region in Nigeria,[63] it is highly questionable as to whether NOSDRA has been able to address the intractable problems. Thus, notwithstanding its primary purpose, one can interpret the NOSDRA as a statutorily mandated agency whose duty is to provide a platform for surveillance and detection of oil spills incidences in Nigeria, thereby ensuring timely, effective, and appropriate response to all oil spills. Also, it ensures that clean-up and remediation of all impacted sites to the best practical extent is undertaken within a reasonable time.[64]

The NOSDRA in line with its powers under section 26 created 2 regulations,[65] as follows:

a) Oil Spill Recovery, Clean up, Remediation and Damage Assessment Regulations, 2011.[66] The objective of this regulation is to establish procedures, methods and other requirements for detection, response, clean-up and remediation of oil spills from onshore and off shore petroleum facilities into or upon land and navigable waters in Nigeria and adjoining shorelines.[67]
b) Secondly, Oil Spill and Oily Waste Management Regulations, 2011.[68] This regulation contains procedures meant to prevent, monitor, and manage discharge of oil or oily waste in harmful quantities into or upon land navigable waters in Nigeria.

4.2 Nigerian Institute for Oceanography and Marine Research (NIOMR)

According to the National Oil Spill Contingency Plan, the NIOMR shall aid in the environmental remediation process by assisting with data for oil spills trajectory models for spillage in brackish and ocean waters, monitoring the level of effect in the coastal and marine environment, monitoring the efficiency of clean-up operations and advise on minimum-destructive methods for speedy recovery of affected regions, upon commission, monitor the recovery degrees of affected areas and document for future use, the utmost satisfactory

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[61]Ibid, pp. 38-39.
[62]NOSDRA Act (n 33).
[63]Rose Ohiama Ugbe and Maria Edet Umo, 'Enforcement Provisions of Major Environmental Law Regimes in Nigeria'. *University of Ibadan Law Journal* [2015] (5) 239-240.
[64]See sections 5, 6 and 7(b) of the NOSDRA Act; See Ugbe and Umo ibid, pp.239-240; See also Lawrence A. Atsegbua and Irene Airen Aigbe, 'An Appraisal of the Mechanisms of Enforcement of Environmental Laws in Nigeria'. *University of Ibadan Law Journal* [2014] (4) 111-112.
[65]For the 2 Regulations, see generally, Irene Airen Aigbe and Emmanuel Chibuzor Akpeme, Protection of the Nigerian Environment: Legal and Critical Analysis of Laws and Regulations'. *University of Ibadan Law Journal* [2016] (6) 146-147.
[66]Published on July 17, 2011 as Government Notice 158 in vol. 98 of the Federal Republic of Nigeria Official Gazette.
[67]Regulation 1.
[68]Published on July 20, 2011 as Government Notice No. 159 in vol. 98 of the Federal Republic of Nigeria Official Gazette.

techniques for clean-up in every ecotype, recommended recovery/restoration procedures for the recovery of affected areas and also provides Technical/Scientific Support Services to the NOSDRA.[69]

4.3 Nigerian Maritime Administration and Safety Agency (NIMASA)

The NIMASA was established by the NIMASA Act 2007. One vital objective of NIMASA is to "regulate and promote maritime safety and maritime labour," and "control and prevent marine pollution." NIMASA is one of the agencies that can participate in oil spills remediation management in Nigeria particularly in the prevention and regulation of marine pollution. Nevertheless, the NIMASA Act does not explain by what means the agency will control and prevent marine pollution. One efficient method of tackling marine pollution is partnership with appropriate agencies by providing advice on the navigability of shipping lanes, creeks and other inland waterways; assisting in response to oil spills occurrences in the marine environment; partnership can also be in the form of data and information distributions, particularly as it relates to oil pollution matters.[70]

4.4 Niger Delta Development Commission (NDDC)[71]

In light of the above considerations, several measures were successfully adopted in order to reduce the extent of oil spills incidences in the coastal areas of Nigeria as well as other oil related criminal activities resulting to vandalization of oil pipelines. In order to find a solution to the challenges, the NDDC was created in 2000[72] among other things, to tackles ecological and environmental issues arising from all forms of oil explorations in the Niger Delta Region[73] and also, to collaborate with oil companies on all matters of prevention of oil pollution and control.[74] Thus, the multifaceted nature of NDDC empowered it to tackle matters relating to oil explorations and production and as both a driver of oil regulatory activities, the NNDC act is a strategic method of tackling all kinds of pollution matters arising from these operations in the Niger Delta Region.[75]

4.5 Nigerian Upstream Regulatory Commission (NURC)

The NURC is an agency of the Nigerian Federal Government set up on the 18th of October 2021, subsequent to the passage and implementation of the Petroleum Industry Act 2021 on the 16th of August 2021.[76] The NURC repealed the Department of Petroleum Resources (DPR) and it is statutorily authorized to carry out the duties of the defunct DPR.[77] The NURC has among others, the aims of promoting healthy, safe, efficient and effective conduct of upstream petroleum operations in an environmentally acceptable and sustainable method.[78] The NURC in its bid to fulfil one of its legal duty of guaranteeing that petroleum industry operators do not

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[69]National Oil Spill Contingency Plan (NOSCP) for Nigeria (n 60) p. 35.
[70]Ibid, p.38.
[71]Established by the Niger Delta Development Commission (Establishment etc) Act 2000 (hereinafter NDDC Act).
[72]Sunday Goodness John and Mehak Jonjua, 'Nigerian Environmental Pollution Concerns and Remediation: A Study of the Coastal Areas of Nigeria'. *IJISET - International Journal of Innovative Science, Engineering & Technology* [2018] (5)(4) 211.
[73]NDDC Act, section 7(1) (e); Nwilo and Badejo (n 12).
[74]NDDC Act, section 7(1) (f); Nwilo and Badejo ibid.
[75]Nwilo and Badejo Ibid.
[76]PIA Act 2021, section 4(1).
[77]See O Udegbunam, 'Nigeria scraps DPR, PPPRA, PEF as new oil agencies take off' *Premium Times* (Nigeria, 19 October 2021); K Jeremiah, 'Finally, government scraps DPR, PPPRA, PEF for new agencies' *The Guardian Newspaper* (Nigeria, 19 October 2021); E Addeh, 'Upstream Commission, 'Midstream/Downstream Authority Formally Begin Operations' *Thisday Newspaper* (Nigeria, 19 October 2021).
[78]PIA Act 2021, section 6(d).

pollute and damage the environment in the course of their activities has adopted the EGASPIN issued by the defunct DPR in 1991, with subsequent amendments in 2002, 2016 and 2018, which is the current version.[79]

Part VIII-B, section 2.11 of EGASPIN deals with remediation and rehabilitation of oil spills affected areas. Section 2.11.1 of the EGASPIN makes it the duty of a spiller to restore to as much as practicable the original condition of any impacted environment.[80] Any restorative procedure to be employed shall sufficiently assess the biological sensitivities of the affected environment.[81] An analysis at the justification level shows that any restorative procedure shall endeavour to attain acceptable lowest oil content and other target values (quality degrees eventually intended for) in the affected environment. For all waters, there shall be no visible oil sheen after the first 30 days of the incidence of the oil spills irrespective of the extent of the oil spills.[82] For swamp areas, there shall not be any sign of oil stain within the first 60 days of occurrence of the incident.[83] For land/sediment, the quality levels ultimately aimed for (target value), is 50mg/kg, of oil content.[84] Further, Part VIII-B, section 2.6.3 of EGASPIN provides that clean-up of oil spills in polluted environments shall be done in such a manner not to give rise to further damages to the previously affected environment. In this case, one could say that an operator should adopt an authorized procedure that would suit the environment within which the oil spills happened. It is expected that clean-up shall begin within 24 hours of the occurrence of the oil spills in order to reduce its harmful effects if remained unabated.[85]

5. OIL SPILLS ENVIRONMENTAL REMEDIATION TECHNIQUES IN THE NIGER DELTA REGION OF NIGERIA

The several procedures engaged in the removal of oil from the natural environment are generally known as clean-up techniques. Virtually all clean-up techniques have the possibility to result to further damage but care has to be taken in embarking upon any remedial procedure in other not to make issues worse. It is therefore arguable that to some extent the clean-up techniques employed for a specific oil spills is dependent mostly on the kind of oil or contaminant (e.g. heavy metals, PCB); the circumstances present at the location and all through the time of the oil spills and the remediation services (e.g. air, water, or soil).[86] The paper examines remediation techniques used in oil spills contaminated soil or land and that used in oil spills contaminated water bodies (e.g. streams, rivers, seas etc).

5.1 Land or Soil Oil Spills Remediation Techniques

Land or soil impacted by oil spills can be remediated using the techniques as discussed in this section.

5.1.1 Physical/Mechanical Remediation Approach

The physical remediation process essentially consists of soil replacement. The technique requires the complete or partial replacement of contaminated soil with an uncontaminated

[79]See E I Kachikwu, Foreword: Environmental Guideline and Standards for the Petroleum Industry in Nigeria, Issued by the Department of Petroleum Resources, Lagos 1991 (Third Edition, DPR, 2018) (hereinafter, (EGASPIN, 2018).
[80]EGASPIN 2018, Part VIII-B, section 2.11.1.
[81]Ibid, section 2.11.2.
[82]Ibid, section 2.11.3 (i).
[83]Ibid, section 2.11.3 (ii).
[84]Ibid, section 2.11.3 (iii).
[85]Ibid, section 2.6.3.
[86]Egbe and Thompson (n 31).

one.[87] The replaced soil is treated as waste. Soil replacement procedure reduces the concentration of heavy metal (loid) in soil, and in turns raises soil functionality.[88] Prior to replacement, the contaminated soil area must be secluded from its surroundings by means of physical barricades to avoid the pollution of the adjoining areas and groundwater.[89] This technique is labour intensive, expensive and appropriate for minor polluted sites. This entails it could be inappropriate for large-scale pollution in the Niger Delta Region.[90]

5.1.2 Chemical Remediation Approach

Chemical remediation technique requires the washing of contaminated soil making use of clean water, reagents, and solvents that can leach the contaminants from the soil.[91] This process could be attained using chemical leaching, chemical fixation, electrokinetic remediation, vitrify technology, chemical immobilisation, oxidation, chemical fluid extraction and photodegradation, among others. The procedure is costly and has the possibility to pollute other environmental media as well as air and water bodies by the introduction of solvents and reagents during remediation. Precisely, the method is quick at clean-up of contaminants; though, dangerous wastes produced in the procedure include carbon dioxide and other greenhouse gases which are released into the neighbouring environment.[92]

5.1.3 Phytoremediation

Phytoremediation is a process in which vegetation (living green plants or their roots) is used to remove, detoxify, or stabilize organic contaminants in soil. In this method enzymes present in plant roots are used to assist degradation of pollutants. It decreases the concentration of pollutants in soil and subsequently diminishes threat posed by such pollutants to the environment and human health.[93] Phytoremediation includes the procedures of phytostabilization, phytovolatilization; phytoextraction; phytodegradation, orrhizodegradation. Phytostabilisatio- n involves using plant roots to absorb and precipitate pollutants thus fixing them to a point and decreasing their bioavailability and movement to other ecological systems, for example, food chain and underground water.[94] Phytovolatilization is the transfer of pollutants (e.g. mercury) to a gaseous state using special matters secreted by plant roots. Phytoextraction is the use of tolerant and gathering plants to absorb pollutants from soil, which are relocated and stored in over-ground areas.[95] The breakdown of pollutants by the metabolic procedures of the plant is referred to as phytodegradation. Rhizodegradation entails the degradation of pollutants by improved microbial activity in the rhizosphere zone (1-5 mm) of the soil.[96] Usually, the diverse methods of phytoremediation have unusual features that make them suitable for diverse soil pollutants.[97]

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[87]Raffa C. M., Chiampo F. and Shanthakumar S., 'Remediation of Metal/Metalloid-Polluted Soils: A Short Review'. *Appl. Sci.* [2021] (11) 4134.

[88]Khalid Sana et al., 'A comparison of technologies for remediation of heavy metal contaminated soils'. *Journal of Geochemical Exploration* (2017) (182) 247-268; Ebiye Asuka, Oku Hyginus and Alexander Chinago B,'Crude Oil Polluted Niger Delta Environment: Conservation Techniques for Survival'.*Scholars Bulletin* [2021](7) (9) 257.

[89]Raffa, Chiampo and Shanthakumar (n 87).

[90]Nenibarini Zabbey, Kabari Sam and Adaugo Trinitas Onyebuchi, 'Remediation of contaminated lands in the Niger Delta, Nigeria: Prospects and challenges'. *Science of the Total Environment* (2017) (6).

[91]Ibid.

[92]Ibid.

[93]Ovririe Emuobosa and Salami Hope, 'Phytoremediation: A Tool for Curbing the Oil Spill Menace in the Niger Delta Region'. *International Journal of Innovative Environmental Studies Research* [2020] (8)(3) 35.

[94]Ngene and Tota-Maharaj (n 39) 5.

[95]Ibid.

[96]Ngene and Tota-Maharaj (n 39); See Zabbey, Sam and Onyebuchi (n 90).

[97]Ngene and Tota-Maharaj, ibid.

5.1.4 Bioremediation

Bioremediation is a method that accelerates the natural biodegradation procedure of hydrocarbons via the provision of nutrients and oxygen needed by microbes. Bioremediation technologies are cost-effective and resource conservative methods. It should be noted that three unique methods are embraced in the perspective of bioremediation such as: bioaugmentation, biostimulation and bioventilation.[98] Firstly, Bio-augmentation is the addition or introduction of foreign microbes into polluted environment for the intension of detoxification of toxic contaminants.[99] Secondly, the modification of environmental parameters for instance, nutrient introduction, biopolymers and biosurfactants is to encourage the growth of oil degrading microbes which in this regard is termed biostimulation. Thirdly, Bioventilation conversely entails the addition of oxygen to the soil voids in order to motivate the growth of microbes.[100]

5.1.5 Remediation

Defining a concept is usually herculean and tasking principally because concepts are mostly evasive and are shrouded with the perspective and idiosyncrasies of the commentator. Remediation can be defined as a procedure intended at restoring the site to its original state. It is thus imperative to appreciate a concept that forms the basis of a discourse as such appreciation delimits the scope and extent of the subject matter. However, there are three techniques of remediation used on land-Remediation by Enhanced Natural Attenuation, Remediation by Stabilization/Solidification and Low Temperature Thermal Desorption.[101] It has been asserted that Remediation by Enhanced Natural Attenuation is a natural land recovery technique that involves the treatment of contaminated soil by spreading top soil on the contaminated soil, aerating the soil through tilling to enhance mixing with native soil, and increase available surface area for microbial activity.[102] While Remediation by Stabilization /Solidification is a soil remediation process by which contaminants are rendered immobile through reactions with additives or processes,[103] it is thus said that it helps in preventing the contaminants from reaching receptors.[104] In another vein, Low Temperature Thermal Desorption is construed as a process in which excavated contaminated material is heated in order to volatilize contaminants.[105]

5.2 Water Bodies (Streams, Rivers, Seas, Etc.) Oil Spills Remediation Techniques

Water bodies impacted by oil spills can be remediated using the techniques as discussed in this section.

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[98]Ibid, p.6; See Aminu D. Usman and Linus N. Okoro, 'Innovations in Oil Spill Clean-up Techniques'. *Chemical Science Review and Letters* [2017] (6)(23) 1911.

[99]Eni D. D and Okpiliya F. E., 'Evaluation of On-Shore Oil Spill Remediation Operations in Port Harcourt'. *Nigeria International Journal of Development and Management Review (INJODEMAR)* [2011] (6) 166.

[100]Ngene and Tota-Maharaj (n 39) 6.

[101]Olukayode A. A., Assessment of Oil Spillage and its Control in the Oil and Gas Industry in Nigeria (Masters Thesis, Ahmadu Bello University, Zaria, 2014) 15.

[102]Stehanie Ereme Jack, Remediation by Natural Attenuation (RENA): Positive Means of Cleaning up Polluted Site, 2018 <https://www.academia.edu/43327738/Remediation_by_Natural_Attenuation_Rena _Positive_Means _of_Cleaning_Up_Polluted_Site> accessed 10 May 2023.

[103]Stabilization and solidification (S/S), January 29, 2013 <https://www.geoengineer.org/education/web-class-projects/cee-549-geoenvironmental-engineering-winter-2013/assignments/stabilization-solidification> accessed 10 May 2023.

[104]See Solidification and Stabilization <https://www.frtr.gov/matrix/Solidification-and-Stabilization/> accessed 10 May 2023.

[105]Fact sheet: Low temperature thermal desorption-ex-situ <https://gost.tpsgc pwgsc.gc.ca/tfs.aspx?ID=50&lang =eng> accessed 1 May 2022.

5.2.1 Containment and Recovery with Boomers and Skimmers

This is normally the first measure used to endeavour to clean-up after an oil spill. Boomers are long, floating device which act like physical barriers placed around floating oil for the intention of not permitting the oil to spread in water so that oil could be recovered.[106] Furthermore, booms may be used to divert and channel oil slicks along preferred pathways, making them easier to remove from the surface of the water. Once the oil is contained making use of booms, 'skimmers' or boats that skim spilled oil from the water surface are used. Skimmers are floating devices used to recover oil from water. They come in diverse designs. The simplest skimmers are suction devices which remove oil from the water surface directly or through a weir, though these have a tendency to collect lots of water at the same time.[107]

5.2.2 Use of Chemical Dispersants

Dispersants are a group of chemicals intended to be sprayed onto oil slicks to stimulate the formation of tiny oil droplets, and delay the reformation of slicks. Substantial environmental and economic profits can be realized, mainly when other at-sea response methods are restricted by weather situations or the obtainability of resources.[108] Dispersants have abilities to break down the oil slicks into lesser droplets and relocate it into the water column where it goes through speedy dilution and can be effortlessly degraded.[109] In some circumstances, dispersants may offer the only means of getting rid of substantial amounts of surface oil speedily, thus reducing or avoiding harm to vital sensitive resources.[110]

5.2.3 In-Situ Burning

In-situ burning is the name assigned to the procedure of burning oil slicks at sea, at or near to the location of a spill. Burning may be seen as a simple technique which has the possibility to eliminate enormous quantities of oil from the sea surface. The decision whether or not to burn oil slicks at sea is usually argumentative. Matters such as the distance of the oil from the destroyed vessel or from a populated area; the possible toxicity of the consequential smoke; the nature of the oil; the possibility of the burn being successful; and the fate of any unburned residues all need cautious consideration before efforts are made to kindle the oil.[111]

5.2.4 Absorption

Absorption is the method used in choppy or fast-moving waters, when techniques like containment and removal fail. In this technique, sorbent materials such as talc, straw, sawdust, and synthetic absorbents are added to the oil slicks and then removed when they have soaked up some of the oil. These sorbent materials function like a big sponge, removing oil but adulterated absorbent materials must be treated as toxic waste and in most cases causes disposal challenges. Furthermore, straw and sawdust can become water-logged and problematic to remove.[112]

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[106]Saurabh Tewari1 and Abhinav Sirvaiya, 'Oil Spill Remediation and its Regulation'. *InternationalJournal of Research in Science & Engineering* [2015] (1)(6) 2.
[107]Ibid, p.31; Anh Tuan Hoang, Van Viet Pham and Duong Nam Nguyen, 'A Report of Oil Spill Recovery Technologies'. *International Journal of Applied Engineering* [2018] (13)(7) 4918.
[108]Egbe and Thompson (n 31).
[109]Dave D. and Ghaly A. E.,'Remediation Technologies for Marine Oil Spills: A Critical Review and Comparative Analysis'. *American Journal of Environmental Sciences* [2011] (7)(5) 429.
[110]Egbe and Thompson (n 31).
[111]Ibid, pp.31-32.
[112]Ibid, p.32.

6. CHALLENGES OF OIL SPILLS ENVIRONMENTAL REMEDIATION IN THE NIGER DELTA REGION OF NIGERIA

6.1 Delays in Carrying Out the Containment, Clean-Up, and Remediation Processes

Regardless of legal obligations to clean-up and remediate land and water speedily and satisfactorily, often this does not take place. There are consistent delays in carrying out the containment and clean-up procedure. Delays in clean-up of oil spills clearly aggravate destruction both to the environment and to human rights that are reliant on environmental quality. In some cases the oil operator or its representatives (companies regularly use contractors to carry out clean-up basically do not turn up for a number of days. In numerous instances, whereas instant containment operations were carried out, the clean-up procedure was not effectively completed.[113]

On 25 June 2001, the Ogbodo Community of Rivers State notified SPDC the day after pipeline ruptures. Some days later SPDC representatives visited the Community. Oil catches on fire, aggravating pollution and damage impacting 42 communities. The relaxed response of SPDC breeds misunderstanding, conflict and mistrust which resulted in inter-communal conflicts over compensation and contracts for oil spills clean-up. In February 2002, SPDC conducted partial clean-up in 2 zones and in March 2005, some more clean-up was conducted. In February 2003, SPDC representatives from London visited the Community and promised a post-impact evaluation and comprehensive remediation but neither was done. Up till now, waterways are still not remediated.[114]

In the case of *SPDC v Councillor F.B. Farah & Ors.*,[115] the Community sued for lack of remediation 22 years after SPDC's Bomu II Well blowout which affected an extensive swath of farming and hunting land. The Community filed the suit at the Bori High Court in Rivers State[116] and are granted N4.6 million (US$210,000) holding that victims of the oil spills should be compensated for loss of income for damaged farmland, and for general damages of shock, fear, and "general inconvenience". On appeal, the trail Court's decision was upheld. Thus, SPDC compensated for loss of crops and economic trees, however not the destruction to land or other long-term impacts based on promise to clean-up and remediate the land. This land is yet to be remediated.[117]

Also, in the case of *Bodo Community v SPDC*,[118] there was a major oil spills on the 28th of August 2008 into Bodo Creek, Ogoniland, killing fish and other wildlife, and destroying mangroves, in addition to destroying farmland and drinking water. This affected several communities. Bodo Community claimed that report of the oil spills was made to NOSDRA and SPDC. After some time, the oil caught fire, adding to air pollution, and aggravating the extent of destruction. No instant action was taken by SPDC. However, SPDC later claimed that the report of the oil spills was made on the 5th of October 2008. On April 2011, the international law firm Leigh Day filed a suit on behalf of Bodo Community in UK Courts. On January 2015, the parties reached an out-of-court compensation settlement of 55 million UK Pounds. However, the Bodo Creek is yet to be cleaned-up.[119]

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[113]Nigeria: Petroleum, Pollution and Poverty in the Niger Delta (n 32) 66; See Anna Maitland and Megan Chapman, *Oil Spills in the Niger Delta:Proposals for an Effective Non-Judicial Grievance Mechanism* (Stakeholder Democracy Network, 2014) 8.

[114]Chapman and Dube, (n 53) 24.

[115]*SPDC v. Farah* (1995) 3 NWLR (Pt 382) 148; Chapman and Dube ibid, p.19.

[116]This case took place before the 1999 Constitution placed full jurisdiction of this matters in the Federal High Court.

[117]*SPDC v. Farah* (n 115).

[118]*Bodo Community v. SPDC* (UK Technology & Construction Court, Case Nos. HT-13-295 and HT-13-339 to 350); Judgment on preliminary issues: (2014) EWHC 1973 (TCC).

[119]See Chapman and Dube (n 53) 25.

6.2 The Problem of Poor Remediation Practices

There is the issue of poor environmental remediation practice in the Niger Delta Region of Nigeria. The procedure of clean-up can result to long-term problems and add to, instead of resolve the harm. Clean-up procedures in the Niger Delta Region often fail to meet any expert understanding of good practice. Several companies have deliberately permitted contractors using unqualified staff to clean-up oil spills, causing poor cleaning and on-going pollution of land and water. Amongst the poor practices identified include: oil set on fire as a method of removing it from the oil spills site, dumping of oil in unlined earth pits where it continues to leak into the soil and can pollute surrounding water bodies, and contractors who merely transport topsoil from somewhere else to cover polluted spill areas.[120]

The UNEP Report pointed out that clean-up efforts by SPDC are not resulting to environmental restoration or legislative compliance, or even compliance with its own (i.e. SPDC) internal procedures.[121] In January 2013 an International Union for Conservation of Nature (IUCN) Panel that was asked by SPDC to assess environmental problems in the Niger Delta Region of Nigeria revealed that regulators had signed off on a site in Soku as cleaned-up despite the fact that the site was still polluted as Chemicals of Special Concern levels found on the site were far higher than standards of EGASPIN.[122] The Panel observed further that; the existing remediation practices in oil impacted areas in the Niger Delta Region are not satisfactory; oil spills responses and remediation are not executed fast enough; and the procedures and regulatory standards for biodiversity and habitat rehabilitation have not been sufficiently established.[123]

6.3 Lack of Capacity within the Regulatory System and Under-Funding of the Oil Spills Environmental Remediation Management Agencies

Environmental remediation agencies are extremely inhibited by absence of capability and resources to make sure that oil companies conform with environmental and safety regulations to address oil spills pollution and remediate the negatively impacted Niger Delta Region environment. It is noted that the NODSRA almost has no capability to visit oil facilities without the active support of the oil companies it is expected to regulate for logistic support. It is alleged that in most cases, the NOSDRA frequently had to call oil companies to get a vehicle to visit a reported spill site, and they often had to depend on oil companies for examination of soil and water samples and for other data.[124] This situation has led to the issue of regulatory capture-regulatory agencies generally lack of structural or actual independence from the regulated sector (i.e., the oil companies).[125]

As at 2008, NOSDRA still has neither a boat nor a helicopter-both essential for monitoring oil spills in the Niger Delta Region with both onshore and offshore oil activities.[126] Confirming the foregoing assertion, a former Director-General of NOSDRA, Sir Peter Idabor,

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[120]Ibid, p.67; See Ihejirika C. E., 'Post-Remediation Assessment of the Quality of Oil Spill Impacted Soils'. *Journal of Environmental Pollution and Management* [2019] (2)(2) 1.

[121]Scott Pegg and Nenibarini 'Oil and water: The Bodo spills and the destruction of traditional livelihood structures in the Niger Delta'. *Community Development Journal* [2013] (48)(3) 395; UNEP, Environmental Assessment of Ogoniland (Nairobi; United Nations Environment Programme, 2011) 135.

[122]No Progress, An Evaluation of the Implementation of UNEP's Environmental Assessment of Ogoniland, three Years on. pp.7-8 <https://reliefweb.int/report/nigeria/no-progress-evaluation-implementation-unep-s-environmental-assessment-ogoniland-three> 11 April 2023 (hereinafter, No Progress); See A report by the independent IUCN - Niger Delta Panel (IUCNNDP) to the Shell Petroleum Development Company of Nigeria Ltd (SPDC), January 2013, p 4.

[123]No Progress ibid, p.8.

[124]Ibid, p.44.

[125]Chapman and Dube (n 53) 16; Amnesty International & CEHRD, Bad Information' (November 2013).

[126]No Progress (n 122) p.44.

during a NOSDRA and Stakeholders 2018 National Oil Spill Contingency Plan and Drills in Port Harcourt, Rivers State, noted that although NOSDRA was established since 2006, it is yet to catch up with its counterparts in other countries of the world in best practices due to inadequate funds, manpower, equipment and weak legal framework, etc.[127] Speaking further, to the competence of NOSDRA in restoring and protecting the environment by guaranteeing best oil sector practices, Ken Henshaw, Executive Director of the Centre for Social Studies and Development (CSSD), observed that NOSDRA is incapacitated by lack of facilities such as speed boat or helicopter required to perform its duties effectively. Most of the oil pipelines are located in impenetrable swamps and jungles only accessible to helicopters and special transport which are only available to the oil companies themselves. NOSDRA do not have access to such transport and have to rely on the truculent co-operation of the offending oil companies, if they must visit the spill site.[128] This appears indefensible given the hundreds of billions of dollars in oil revenues that have been amassed by the Nigerian Federal Government.[129]

Approving that oil-affected sites are appropriately cleaned-up is the duty of the government regulators. Nevertheless, Amnesty International and Centre for Environment Human Rights and Development (CEHRD) have discovered severe inadequacies of capacity of government regulators in this regard. The NOSDRA has certified as clean sites that are evidently polluted. The findings of the report based on field research carried out by Amnesty International and CEHRD in Ogoniland in the Niger Delta Region of Nigeria in July to September 2015 on four sites at which significant oil spills had happened: Boobanabe, Bomu Manifold, Barabeedom swamp and Okuluebu showed evidence of poor remediation practice. The oil spills date back many years or in the case of Boobanabe, a number of decades.[130]

45 years after a fire and oil spills incidence at SPDC's Bomu Well 11 at Boobanabe, researchers noticed water-logged areas with an oily sheen, and soil was black and covered with oil.[131] This is against the Nigerian Federal Government regulations that there should be no oil in water 60 days after an oil spill.[132] The SPDC claimed to have cleaned-up and remediated the site in 1975 and in 2012. Outside the perimeter of the Bomu Manifold at Kegbara Dere which SPDC claimed to have cleaned-up in 2012, researchers noticed soil soaked with crude oil. The pollution occurred around 2009 when an enormous fire and oil spill happened at the Bomu Manifold, an area where numerous SPDC pipelines meet. The Barabeedom swamp is noticeably polluted with crude oil a year after the Nigerian Federal Government regulator certified it as clean. At Okuluebu, researchers noticed patches of oil-blackened soil at numerous sites despite the fact that the Nigerian Federal Government regulator certified the area as clean in 2012.[133]

6.4 Sabotage, Crude Oil Theft, Illegal Oil Refining, and Infrastructure Failures

Sabotage, crude oil theft, plus illegal refining operations that are harmful to the environment has to a large extent posed a serious threat to sustainable oil spills pollution environmental remediation in the Niger Delta Region of Nigeria. In March 2013, SPDC pronounced a second shutting of a pipeline (the Nembe Creek Trunk Line), resulting from substantial leakages caused by crude oil theft. This same pipeline had been closed in December 2011 after major

[127]Egufe Yafugborhi, 'Nigeria lags behind in response to oil spill-NOSDRA' *Vanguard* (Lagos, 18 April 2018).
[128]Lucius Ezeaka Nwosu, 'Compensating Environmental Damage in Oil & Gas Operations' Paper presented at the Annual General Conference on Nigeria and the Challenge of Development in the Niger Delta, organised by the Nigerian Bar Association, Port Harcourt, Rivers State, 28th August, 2006, p.26.
[129]No Progress (n 122) p. 44.
[130]Clean It Up: Shell's False Claims about Oil Spill Response in the Niger Delta (Amnesty International, 2015) 4-5.
[131]Ibid.
[132]See generally, EGASPIN 2018, Part VIII-B, section 2.11.3 (i)(ii)(iii).
[133]Clean It Up (n 130).

oil spills caused by crude oil theft then. It is thus obvious from the outset that such spillages result to recurrent effects on the environment. In this regard, SPDC for instance, admits that operational spills happen infrequently but furthermore assert that pipeline vandalization, crude oil theft and illegal refining oftentimes results to numerous oil spills along the pipelines which regularly affects production capacity. As a result of these criminal activities, communities keep reporting loss of income-generating opportunities and several environmental hazards on their fishing and farming settlements as a result of the incessant oil spills.[134]

Reports of crude oil theft have likewise escalated in the Niger Delta Region. This is because of the unrestricted operations of oil bunkering in the region, a condition that has similarly occasioned oil pollution in the whole environment. SPDC has claimed to have suffered 137 oil spills due to sabotage and crude oil theft in 2012, with the capacity loss of about 33,000 tonnes of crude oil. The SPDC approximates it is losing between 100,000 and 150,000 barrels of crude oil a day to bunkering, a claim the oil producing communities discredited, that it is not because of crude oil theft but instead as a result of SPDC neglects of their pipeline network.[135]

7. CONCLUSION

This article reviewed the environmental remediation management in the Niger Delta Region of Nigeria with focus on oil spills remediation in the Niger Delta Region – a region whose environment has been severely devastated by oil spills incidences. Using a framework consisting of oil spills incidences in the Niger Delta Region of Nigeria, management of oil spills remediation in the Niger Delta Region, key environmental remediation management agencies in Nigeria, oil spills environmental remediation techniques and challenges of oil spills environmental remediation in the Niger Delta Region, this article presented a broad review of environmental remediation management in the Niger Delta Region of Nigeria with focus on oil spills remediation and arrived at several significant findings.

The Niger Delta Region environment has been negatively degraded as a result of pollution resulting from oil spills occurrences. The issue with oil is that even years after a spillage, without appropriate clean-up and remediation, oil remains in the environment. Environmentalists and people mostly give blame to the oil companies but the Nigerian Federal Government has the constitutional responsibility to provide the laws, legislations and policies enacted to protect and remediate the environment which the oil companies must abide by. Section 20 of the Nigerian 1999 Constitution obliges the state to protect and improve the environment and safeguard the water, air and land, forest, and wildlife of Nigeria. Again, sections 33 and 34 provides for fundamental human rights to life and human dignity respectively, which are contended to be connected to the requirement for a healthy and safe environment to give these rights effect.[136]

Despite this constitutional duty on the Nigerian Federal Government to protect the environment, the Niger Delta Region has been suffering the destructive environmental effects of oil development since the discovery of oil in Nigeria in 1956. Oil spills occurrences have devastated the coastal vegetation, polluted drinkable water, contaminated farming land,

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[134]See IUCN Niger–Delta Panel (n 5) 33.

[135]Sobrasuaipiri Sobomate, Environmental Justice in Nigeria: Reflections on the Shell-Ogoni Uprising, Twenty Years Afterwards. Responsible Development in a Polycentric World: Inequality, Centizenship and Middle Classes, 14th EADI General Conference 23-26 June 2014, Bonn; See Alike E., 'Shell decries environmental cost of oil theft in Niger Delta' *Thisday Live* (Lagos, April 14th 2013).

[136]James Okolie-Osemene and Joachin Uche Okanume, 'Contravening Environmental Laws: Practices of Multinational Oil Companies in Niger Delta, Nigeria'. *The A38 Journal of International Law* [2014] (1)(3) <oer.wellspringuniversity.edu.ng>oer>C...> accessed 15 March 2022; See Owolabi E. E., 'Environmental Pollution and Degradation: A Threat to National Security and Peace in Nigeria'. *Sacha Journal of Environmental Studies* [2012] (2)(1) 49.

streams, creak, rivers, and seas for fishing, and led to the general loss of livelihood of the Niger Delta Region people.

Several environmental remediation management agencies with the operational policies guiding them have been put in place by the Nigerian Federal Government to decrease the danger of oil spills occurrences in the country. Some of these agencies include: 1) the NOSDRA; 2) the NIOMR; 3) the NIMASA; 4) the NDDC); and 5) the NURC. All these agencies and their operational policies are meant to assist in the management and remediation of the adversely polluted Niger Delta Region environment. However, it is contended that these legal frameworks have proved unsuccessful in stopping Nigeria's Niger Delta Region environmental issues and that it seems that several of our laws are seen on papers alone but not executed in the actual sense.[137]

8. RECOMMENDATIONS

In the light of the discussions, the issues identified and examined, the authors therefore recommend that:

1. As part of their corporate social responsibility, oil companies operating in the Niger Delta Region of Nigeria should in collaboration with the Nigerian Federal Government embark on immediate comprehensive environmental clean-up and remediation of polluted areas in the Niger Delta Region.
2. The National Oil Spill Detection and Response Agency (NOSDRA) should monitor and oversee all clean-up and remediation operations on oil affected sites to ensure that they are in line with regulatory standards. Additionally, the Nigerian Federal Government should strengthen the role of NOSDRA by making sure that NOSDRA has sufficient staff, adequate funding, and equipment to perform its functions appropriately and independently of the oil companies.
3. The National Oil Spill Detection and Response Agency should provide a facility to allow communities to report oil spill sites that requires clean-up and remediation by setting up for example, an oil spill emergency response platform where community members can reach it via mobile telephone to report cases of oil spills. This will help accelerate response to oil spill incidents.
4. The Nigerian Federal Government should undertake a review of the compensation and remediation systems with a view to increasing access to effective remedy for people whose rights are affected by oil spill incidences in the Niger Delta Region. Further, the compensation awarded to victims of oil spills incidences should be adequate to assuage the harm and lost suffered by the victims.

[137]See Okolie-Osemene and Okanume ibid.