

Original Research Article

Vulnerability of Local Communities to Oil Installation in Isoko Local Government Area of Delta State, Nigeria.

1
2
3
4
5
6
7
8
9

ABSTRACT

Background of Study: Petroleum exploration has generated over 90 percent revenues to the Nigerian government, and as such the nation pays all her liabilities from the sales of petroleum products. Nigerian's mono economy mostly based petroleum exploration, has brought a lot of sufferings to the people in the region where the oils are being drilled from. The people of Isoko Local Government Area (LGA) has suffered from the environmental pollution and devastation of their lands as a result of oil exploration activities for many years now, especially from numerous oil installations of the operating oil companies. This study examines the vulnerability of the local communities to these oil installations.

Materials and Methods: The study employed the use of questionnaire to acquire data relating to the vulnerability of communities to oil installation in Isoko LGA in Delta State. 600 copies of questionnaires were administered to the residents of the chosen communities using a simple random sampling technique which gives room for equal chance of any of the resident to be chosen in the study area. Descriptive statistics was used to explain the frequencies of the variables in terms of their percentage. Results of the analysis were presented using tables, bar charts, hazard maps, among others.

Results: it was revealed that the vulnerability to oil installation is high in the Isoko LGA, thereby leading to a high rate of environmental degradation in these communities.

Conclusion: it is concluded that end the suffering of the people to oil installations, the operating oil companies should pay special attention to needs of their host communities and proactive to any possible hazard that might have results from oil installation. The government should enforce the environmental laws that protect the environment and ensure that the multinational oil companies adhere strictly to them.

Keywords: *Vulnerability, exploitation, exploration, petroleum and oil installation.*

1. INTRODUCTION

The importance of petroleum took a giant leap in the 1800's when it replaced coal as the primary source of fuel for the machines of the industrial revolution [1, 23]. Today, the importance of oil is overwhelming as it has become versatile and a powerful source of energy [23]. In 1858, a 39 year old carriage maker from Hamilton, Ontario, named James Miller Williams made the first major commercial oil discovery in North America at Oil

19 Springs, Ontario [23]. He reached oil at a depth of only 18 meters. The following year, Colonel Edward L.
20 Drake discovered oil in Titusville, Pennsylvania by drilling to 21 meters [1, 23]. These two discoveries
21 signalled the birth of modern petroleum in United States and the world at large [23]. Oil and natural gas are
22 dominant fuel sources in the US economy, as it provides 62% of the nation's energy and about 100% of its
23 transportation fuels and this situation are similar for many other nations [2]. Since the discovery of oil, oil
24 spillage and environmental pollution has become a global issue, which resulted from the era of industrial
25 revolution [15, 16]. In 1956, Shell British Petroleum (now Royal Dutch Shell) discovered crude oil at a village
26 Oloibiri in Bayelsa State located within the Niger Delta of Nigeria [3] and commercial production began in
27 1958 [8].

28
29 Oil exploration and exploitation has been on-going for several decades in the Niger Delta [9]. The oil
30 exploration activities resulted in disastrous impacts on the environment in the region and have adversely
31 affected people inhabiting this region [10]. The Niger Delta is among the ten most important wetlands and
32 marine ecosystems in the world [12]. The oil industries located within this region has also contributed
33 immensely to the growth and development of the country, which is a fact that cannot be disputed [21], but
34 unsustainable oil exploration activities has rendered the Niger Delta region, to be one of the five most severely
35 petroleum damaged ecosystems in the world [11, 21]. Studies have shown that the quantity of oil spilled over
36 the last 50 years in Nigeria was a least 9-13 million barrels, which is equivalent to 50 Exxon Valdez spills [3,
37 14]. The Niger Delta consist of diverse ecosystems of mangrove swamps, fresh water swamps, rain forest and is
38 the largest wetland in Africa but due to oil pollution the area is now characterized by contaminated streams and
39 rivers, forest destruction and biodiversity loss in general the area is an ecological wasteland [8]. This affects the
40 livelihood of the indigenous people who depend on the ecosystem services for survival [18, 19].

41
42 It is reported that in Isoko Local Government Area, oil spills results from of oil installations always have direct
43 consequence on crude oil production [4]. They may also result in changes to both the landscape and the socio-
44 economic activities in the area [9]. Spills during oil installations may also result from the faults at any stage of
45 the production and movement of crude along the oil installations, as products involves many mechanical
46 processes, the continued efficiency of which may not be guaranteed [13, 22].

47
48 It is rather unfortunate that even though these oil companies have made enormous profits from their oil
49 exploration activities in Nigeria, they have contributed minimally to the country's development [4, 17]. In
50 Isoko, where we have a large number of oil installations giving rise to oil spills, these have posed a major threat
51 to the environment, which has led to total annihilation of the ecosystem. Thus, life in this area is becoming
52 increasingly unbearable due to the ugly effects of oil spills caused by the presence of oil installations [5].
53 Intermittent oil spillages have rendered vast stretches of indigenous farmlands useless. Therefore, as important
54 as oil might seem to the nation's economy, the people perceive the discovery of oil as a threat to their life
55 support system – the land.

56
57 In March 2005, overflow of crude oil in Oleh flow station spilled barrels of crude oil in the environment
58 causing pollution within the area. The most recent of all the spillages is the one that occurred on 24th of October
59 2007 at Oleh oil field where a 40 inches pipe bursts a result of corrosion and spilled over two hundred barrels of
60 crude oil into the environment that unfortunately caught fire and killed one lady in her house and also destroy
61 aquatic lives and the mangrove ecosystem. This particular oil spill had a serious impact on the vegetation and
62 wildlife to the extent that agricultural lands were damaged and the aquatic lives in the surrounding streams and
63 rivers were floating dead on water.

64 Currently, in Isoko environment, large areas of the mangrove ecosystem have been destroyed. The mangrove
65 was once a source of fuel for the indigenous people and a habitat for the area's biodiversity, but the intensity of
66 pollution in this area has destroyed the natural systems. Also, oil pipelines could be seen crisscrossing the

67 communities to the various wells of the oil company, which displaced places that formerly used for farming and
68 human settlement.

69
70 The mischievous and inhuman processes of oil exploration in Nigeria has given birth to consequences, that are a
71 direct negation of the fundamental concept of sustainable development [6], and contrary to development that
72 meets the needs of the present without compromising the ability of future generations; in order to meet their
73 own needs. Hence, the frequent accidental release of crude oil into the Isoko environment is causing a lot of
74 degradation to their source of livelihood. This includes the forest, wetlands, rivers, swamp streams, ponds and
75 fisheries resources. The impact on marine life is compounded by toxicity and tainting effects resulting from the
76 chemical composition of the oil, as well as the diversity and variability of biological systems on their sensitivity
77 to oil pollution. Another negative effect of this oil spillage and other oil exploration activities in this area is its
78 effect on wildlife, which has precipitated forced migration of a wide range of apes, especially monkeys that
79 were highly visible and ubiquitous within this area before the advent of oil exploration [7].
80

81 According to the indigenous people of Isoko, their sources of livelihood have been pervasively destroyed by
82 the activities of the oil companies, and even the payment of compensation and royalties has deliberately delayed
83 and highly politicized. The so called compensation most times does not even get into the hands of those it is
84 meant for and in some cases, nothing is paid at all. Consequently, there has been increased vandalization of
85 installed oil pipelines by the host communities. It is therefore the aim of this study to investigate and evaluate
86 the community views to the vulnerability of communities to oil installations in Isoko Local Government Area
87 (LGA) of Delta State.
88

89 2. MATERIALS AND METHODS

90 Four communities (**Aviara, Enwhe, Ellu and Otibi**) from Isoko LGA were purposively selected for this study.
91 The study employed the use of questionnaire to acquire data relating to the vulnerability of communities to oil
92 installation in Isoko LGA in Delta State. Six hundred (600) copies of questionnaires were administered to the
93 residents of the chosen communities using a simple random sampling technique which gives room for equal
94 chance of any of the resident to be chosen in the study area. All the distributed questionnaires were retrieved
95 and further statistical analysis were carried out. Descriptive statistics was used to explain the frequencies of the
96 variables in terms of their percentage. Results of the analysis were presented using tables, bar charts, hazard
97 maps, among others.
98
99

100 3. RESULTS AND DISCUSSION

101 3.1 Socio economic Profile of Respondents

102
103 Table 1, shows the distribution of the sample, which was administered in four major communities of Isoko
104 LGA. In the communities (Aviara, Enwhe, Ellu, and Otibo), the total of 221 males and 304 females were
105 capture in the survey as given in Table 1.
106

107 **Table 1: Selected Community Distributions of Respondents**

Towns	Male	Female	Total
Aviara	45	49	94
Enwhe	64	46	110
Ellu	45	87	132
Otibo	67	122	189
Total	221	304	525

108 Source: Field Work, 2019.
109

Table 2 showed that of the total population of 525, 42.09% (221) of the respondents are males, while 57.90% (304) of the respondents were females. In other words, a greater percentage of the respondents in the study area are females.

Table 2: Sex Distribution of Respondents

Sex	Frequency	Percentage%
Male	221	42.09
Female	304	57.90
Total	525	100

Source: Field Work, 2019

In Table 3, the age distribution of the respondents that was used in the study is shown. The age range (years) used for the study is between 16-25, 26-35, 36-45, 46-55, and 56 and above, with the total frequencies and percentages as 55(10.47%), 57(10.87%), 56(10.66%), 187(35.6%), and 170 (32.38%) respectively.

Table 3: Age Distribution of Respondents

Age Range(years)	Frequency	Percentage%
16-25	55	10.47
26-35	57	10.85
36-45	56	10.66
46-55	187	35.6
56 and above	170	32.38
Total	525	100

Source: Field Work, 2019

In table 4, it is observed that married people constitute 337(64.19%) of the total respondents, while the singles were 50(9.52%), widows 27(5.14%), widowers 38(7.23%) and divorcees constituting 73(13.9%). This result revealed that the majority of the respondents are married.

Table 4: Marital status of respondents

Marital Status	Frequency	Percentage (%)
Married	337	64.19
Single	50	9.52
Divorce	73	13.9
Widow	27	5.14
Widower	38	7.23
Total	525	100

Source: Field Work, 2019.

The table 5 below shows that, 323(61.52%) had no formal education, 67(12.76%) had only primary education, 94(17.90%) had secondary education and only 41(7.80%) had tertiary education, which includes either a first Degree or Higher National Diploma (HND), or a Master's Degree. Therefore, on the whole, about 39 percent of the respondents had some form of formal education, against 61 percent of the respondents who do not have any form of formal education. This is an observation which tends to refute the alarming rate of illiteracy prevalent in rural communities.

Table 5 Educational Distribution of Respondent

Educational Level	Frequency	Percentage
Non-Formal	323	61.52
Primary	67	12.76

Secondary	94	17.90
Tertiary	41	7.80
Total	525	100

Source: Field Work, 2019

3.2 Analysis of oil Installation hazards in Isoko Local Government Area

In order to determine whether oil installations pose any hazards to the livelihood and asset of Isoko LGA, the respondents were asked the question, “oil installation does not pose any hazard to the livelihood and asset of the host community”. All the respondents stated that they strongly disagree. In other words, the respondents answered in such a way because they generally believe that oil installations pose a lot of hazards to the host communities, which was also observed during the reconnaissance survey. The respondents thus mentioned some of the hazards that the citing oil installations has caused in their communities, some of which include: flared gas and massive destruction of agricultural farm lands (17.9%), destruction of the marine ecosystem and effluent and waste discharge (20.9%), erosion (25.1%), deforestation (36%) where the most prominent hazards specified.

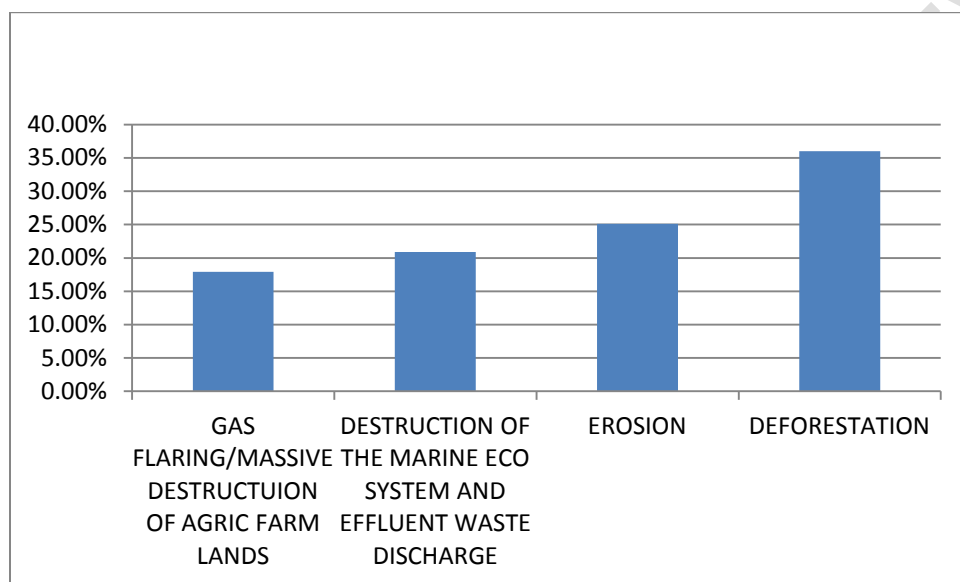


Fig.1: Bar chart showing the types of hazards mentioned

3.3 Hazard maps to show how vulnerable the area is to oil installations

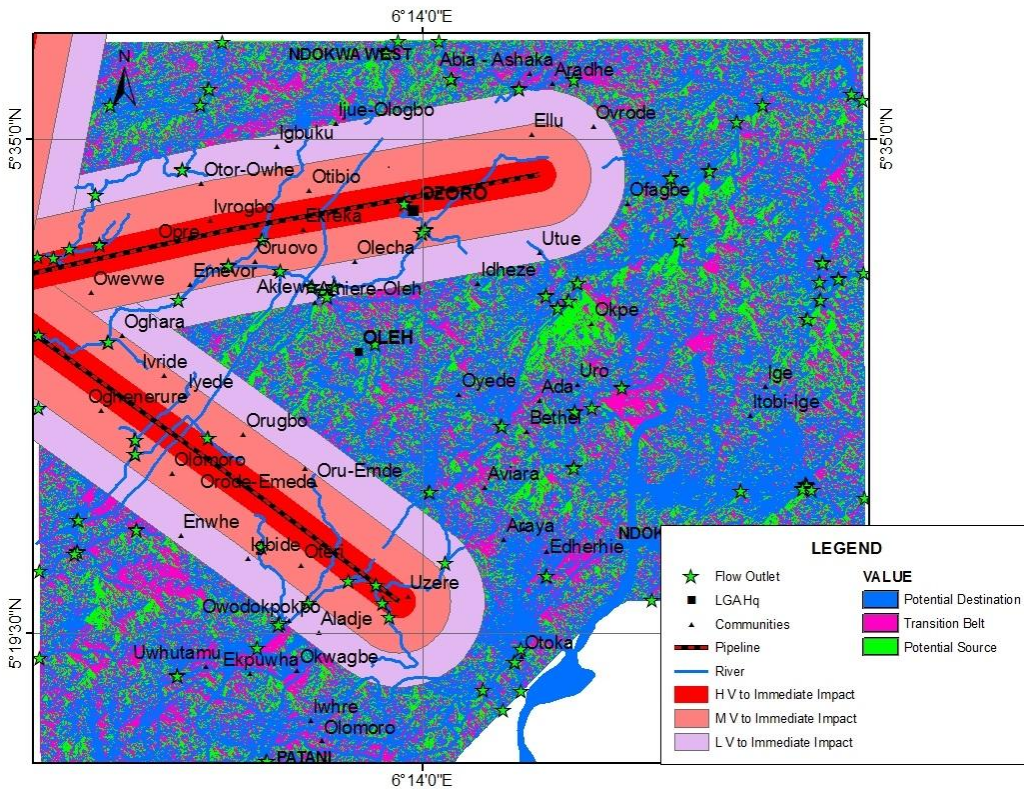


Fig. 2: Community Vulnerability to Pipeline at 1, 2 and 3km (Source: Fieldwork, 2019)

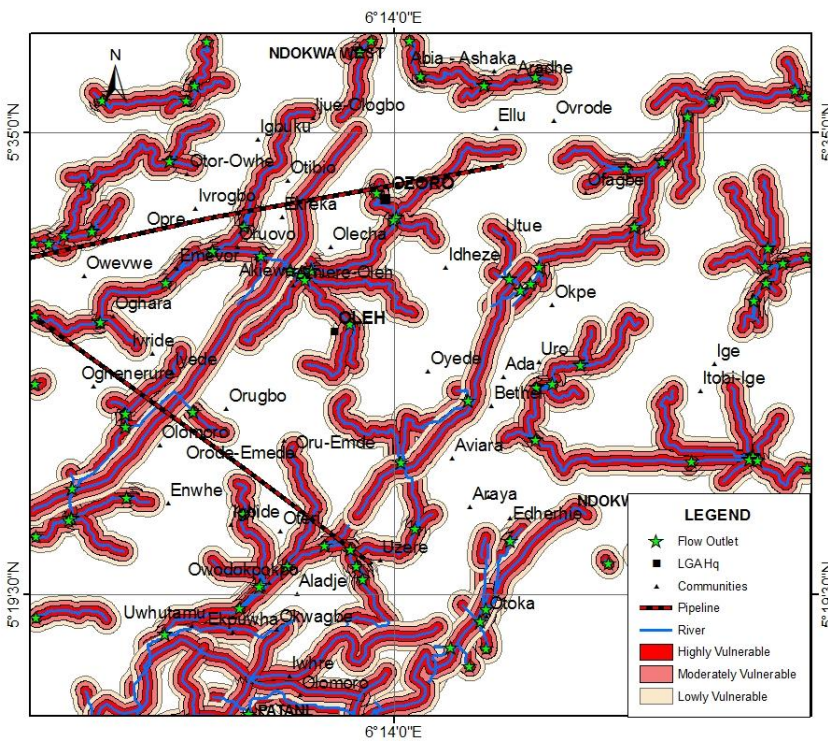


Fig. 3: Community vulnerability to stream Pollution (Source: Fieldwork, 2019)

3.4 Analysis on the effect of poverty on vulnerability to oil installation

Table 6: Respondents views on the effect of poverty on vulnerability to oil Installations

Responses	Frequency	Percentage
Strongly Agree	232	44.19
Agree	80	15.23
Disagree	99	18.85
Strongly Disagree	114	21.71
Total	525	100

Source: Field Work, 2019

The Table 6 shows some of the responses from the question asked “if poverty increases the vulnerability of the people to oil installations”. 21.71% of the respondents strongly agreed, 15.23% agreed, 18.85% disagree and 21.71% strongly disagree. Some of the additional factors mentioned by the respondents included ignorance, lack of public enlightenment, and others.

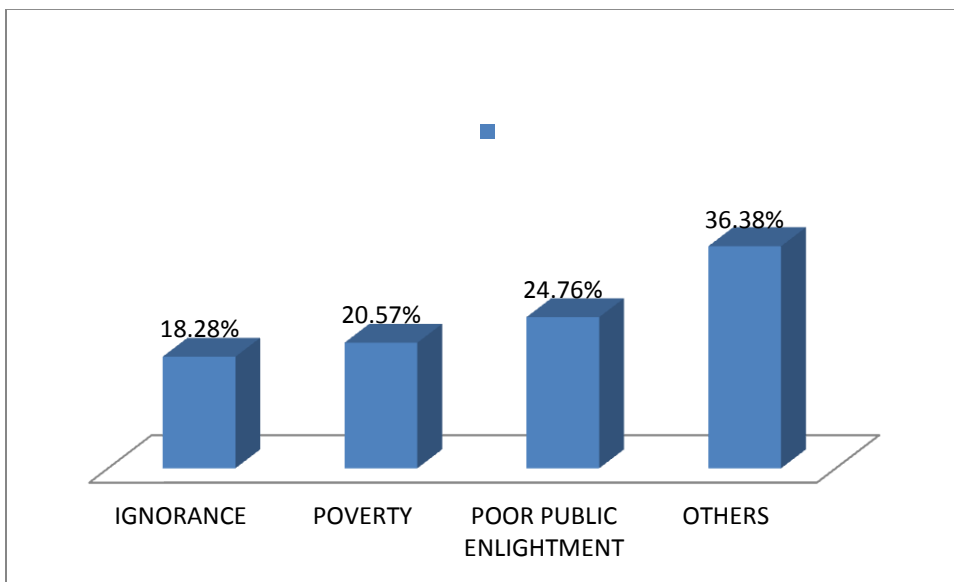


Fig. 4: factors that increase the vulnerability of the people to oil installations (Source: Fieldwork, 2019)

The figure above shows that the other factors (36.38%) that was not mentioned was the major cause of the increased vulnerability to oil installations, the mentioned factors were ignorance (18.28%), poverty (20.57%), poor public enlightenment (24.76%) and oil derivation /revenue allocation (20%).

In other words, ranking order of the factors that increase the people’s vulnerability to oil installations revealed that unemployment which was categorized as other factors not mentioned ranks first, while poor public enlightenment ranked second, poverty ranked third, and finally, ignorance ranked fourth.

Table 7: Awareness of respondents to oil installation hazard

Responses	Frequency	Percentage
Strongly Agree	432	82.28
Agree	50	9.52
Disagree	29	5.52
Strongly Disagree	14	2.66
Total	525	100

Source: Field Work, 2019

As shown in the Table 7, the majority of the respondents, 432 (82.28%), strongly agree that they are aware of the hazard associated with oil installation in their community and the reason for such, as gathered, was due to proper enlightenment by Nigerian government and oil companies located in the area. 50 persons (9.52%) agreed that they are aware of the hazard associated with oil installation in their community, also due to the reasons stated. 29 persons (5.52%) disagree and 14 (2.66%) strongly disagree of their awareness to hazard associated with oil installation in their community, but rather pointed out that if such hazard ever existed it will be due to the poor quality of materials used in the construction of pipelines. They also attributed possible hazards to the poor topography of the area, which usually causes to massive erosion, leading to burst pipelines pipes, which should have been checked by the government or the oil companies drilling oil in their community.

3.3 Adaptation strategies by Respondents

Respondents were asked which coping strategies they would employ to counter the likely damaging effect of oil installations that were closed to their source of livelihood. Some options were given as shown in the Figure 4.6, below.

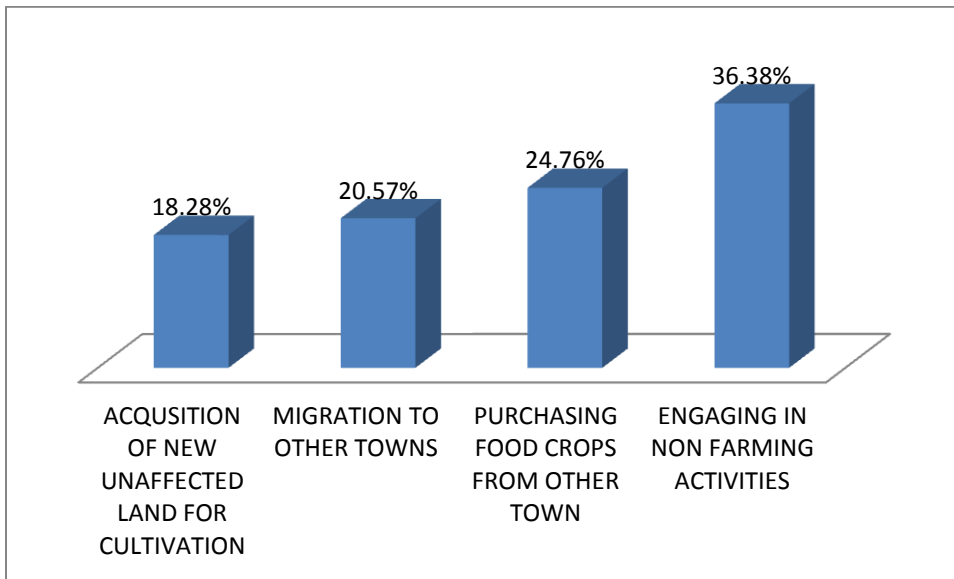


Fig. 5: Bar chart showing coping strategies (Source: Field Work, 2019)

As shown in the figure 5, it was revealed that 36.38% of the respondents plan coping with the likely damaging effect of oil installation by engaging in non-farming activities; 24.76% to purchase of food crop items from an unaffected neighbouring towns; 20.57% intends to migrate to other villages/towns and 18.28% of the respondents believe that they can acquire new unaffected land for cultivation if such situation arises.

4. CONCLUSION

In the view of the study, it was revealed that the vulnerability to oil installation is high in the Isoko LGA, thereby leading to a high rate of environmental degradation in these communities. The operating oil companies should pay special attention to needs of their host communities and proactive to any possible hazard that might have results from oil installation. The government should enforce the environmental laws that protect the environment and ensure that the multinational oil companies adhere strictly to them.

226
227
228 **REFERENCES**
229
230

- 231 1. Knowles, R.S. (1983). *The First Pictorial History of the American Oil and Gas Industry 1859-1983*. Ohio
232 University Press, Athens, OH. 169pp
233
- 234 2. National Energy Policy Development Group, (2001). *National Energy Policy, Report of the National*
235 *Energy Policy Development Group*. May 2001
236
- 237 3. Federal Ministry of Environment Abuja, Nigerian Conservation Foundation Lagos, WWF UK and
238 CEESP-IUCN Commission on Environmental, Economic, and Social Policy, May 31,(2006). *Niger Delta*
239 *Resource Damage Assessment and Restoration Project*.
240
- 241
- 242 4. Jike, V. T. (1987). *Us And Them: Social Determinants Of Work Attitudes In Nigeria's Urban Employment*
243 *Sectors*. Unpublished Doctoral Thesis, University Of Bath, England
244
- 245 5. Oyem, A., (2001). *Christian call for action on Nigerian oil spill*. Sage-Oxford's Christian Environmental
246 Group.
247
- 248 6. Nwankwo, N. and Ifeadi, C.N (1988). Case studies on the environmental pollution of oil production and
249 marketing in Nigeria; In: Sad, P.O. and Odemerho, P.O. (eds.) 1988. *Environmental issues and*
250 *management in Nigeria development*, Evans Brothers, Ibadan, Nigeria. 208 –223.
251
- 252 7. Bodo, T. (2018). Community Understanding of the Environmental and Socio-economic Consequences of
253 Petroleum Exploitation in Ogoni, Rivers State, Nigeria. *International Journal of Advanced Research and*
254 *Publications*. 2(11): 51-55
255
- 256 8. Bodo, T. (2019). Deep Issues behind the Crisis in the Niger Delta Region: The Case of Oil Exploration in
257 Ogoniland, Rivers State, Nigeria. *Asia Journal of geographical Research*. 2(1):1-12
258
- 259 9. Bodo, T. and Ukpong I.E (2018). Community Participation in the Remediation of Petroleum Impacted
260 Sites in Ogoni, Rivers State, Nigeria. *Multi-disciplinary Journal of Research and Development*
261 *Perspectives*. 7(2): 97-104 (A publication of University of Calabar).
262
- 263 10. Bodo, T and David, L.K (2018). The Petroleum Exploitation and Pollution in Ogoni, Rivers State, Nigeria:
264 The Community Perspective. *European Scientific Journal*. 14(32): 97-212.
265
- 266 11. Akpomovie, O.B (2011). Tragedy of Commons: Analysis of Oil Spillage, Gas Flaring and Sustainable
267 Development of the Niger Delta of Nigeria. *Journal of Sustainable Development*, 30(2): 200-210.
268
- 269 12. Cookey, A.T, Bodo, T and Owunari, P.T (2019). Health risk implications among solid waste workers in
270 Obio-Akpor Local Government Area of Rivers State. *Asian Research Journal of Arts & Social Sciences*.
271 9(1): 1-6
272
- 273 13. Agbonofo, J. (2009) *Development as conflict: Ogoni movement, the state and oil resources in Niger Delta,*
274 *Nigeria*, doctoral thesis, available (online) http://repub.eur.nl/res/pub/32647/90-423-03808_DOK%5B1%5D. (Retrieved on the 5th June, 2019)

- 272 14. Azaiki, S.S (2007). Oil, Gas and Life in Nigeria. Ibadan: Y – Books.
273
274
- 275 15. Babatunde, A (2010). Environmental conflict and the politics of oil in the oil-bearing areas of
276 Nigeria's Niger Delta. *Peace and Conflict Review*, 5(1): 1-10
- 277 16. Ebeku, K.S.A. (2018). Cyprus hydrocarbons: lessons from the Nigerian experience. *European*
278 *Scientific Journal*, 14(1): 75-96.
- 279 17. David, L. K and Bodo, T (2019). Environmental Pollution and Health Challenges of the Ogoni People,
280 Rivers State, Nigeria. *International Journal of Advanced Research and Publication*. 2(2): 28-32
281
- 282 18. Hamilton, D. I (2011). Oil and gas companies and community crises in the Niger Delta. *American Review*
283 *of Political Economy*. 3-17.
284
- 285 19. Imosemi, A and Abangwu N (2013). Compensation of oil spill victims in Nigeria: the more the oil, the
286 more the blood? *Singaporean Journal of Business Economics and Management Studies*, 2(3): 30-43.
- 287 20. Mmon P. and Igbuku A. (2015) Challenges and Prospect of Environmental/Restoration in Niger Delta of
288 Nigeria: The Case of Ogoniland. *Journal of Energy Technologies and Policy*. 5(1):12-20
- 289 21. David, L.K and Bodo, T and Gimah, B.G (2019). Petroleum pollution and decrease neuroplasticity in brain
290 development of the Ogoni children in Rivers State, Nigeria. *Journal of Advances in Medicine and Medical*
291 *Research*. 29(11): 1-13.
292
- 293 22. Bodo, T; David L.K and Gimah, B.G (2019). Isolation and identification of microorganisms associated
294 with bioremediation of oil spilled site in Bodo West, Rivers State, Nigeria. *Journal of Geography,*
295 *Environment and Earth Sciences International*. 21(3): 1-8.
296
- 297 23. Fagan, A (1991). An introduction to Petroleum Industry. Government of Newfoundland and Labrador,
298 Department of Mines and energy.
299

300

301

302

303

304