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Factors of Environmental Degradation in Oil Producing Communities of Delta State, Nigeria

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Abstract

This study examines the factors of environmental degradation in oil producing communities of Delta State, Nigeria. Results showed that 95.2% of the people had experienced environmental degradation from the oil producing communities and some agreed that most of the effects are still ongoing. The overall major cause of environmental degradation in all the oil producing communities is the negligence of duty by government agencies charged with oversight duties of monitoring and compliance (30.8%), Neglect of Environmental regulations/compliance (26.8%), corruption (23.6%), lack of Environmental Impact Assessment (EIA) reports from companies either at the beginning of the project or periodic assessment (14.7%) respectively. This has however, given rise to high degree of sabotage that causes oil spillage in the area. The data collected were analyzed using the multiple regression analysis (MRA). From the analysis oil spillage mode explained 100% while in the case of gas flaring the model explained 74.39% at <0.05. Based on the findings, recommendations were proffered.

Keywords: Degradation; environment; factors; oil producing; communities; Delta State

1. Introduction

Nigeria is a major player in the world energy market. It is the seventh largest producer of oil in the world. It supplies a fifth of United States oil imports and is at present further becoming an important supplier in the global liquefied natural gas (LNG). Instability in world oil supplies and the critical link of oil to the international economy has made Nigeria and more generally African oil to be more strategic (Ikelegbe, 2005). The Delta region of Nigeria produces over 90 percent of the oil extracted in Nigeria. This analysis is significant to the study because of a few significant factors; first, it was observed by (Awosika, 2008) that, the incident of primary commodity exports and specifically mineral wealth in States has been found to be associated with conflict and occurrence of civil wars. Secondly, according to Reno (2003), the exploitation of natural resources has played a prominent part in conflict in Nigeria. Ever since the discovery of oil in 1956, it is estimated that over USD300 billion has accrued the Federal Republic of Nigeria from sales of crude oil over forty years of exploration (Awosika, 2008).

Given this enormous capital accumulation, it should have been expected that the oil bearing communities of whose land oil was extracted would have been more materially prosperous and better off than their ethnic counterparts in the State. But unfortunately, the reverse is the case. As noted by Obi (2002), "In spite of the overwhelming contribution of the oil minority areas of the Delta to Federal Revenues, they have been excluded from direct access to oil revenues, except through federal and ethnic majority benevolence". Consequently, the region by 1990s was one of the least developed and poorest in the Nigerian State (Ikelegbe 2005). A number of factors accounts for this rather unfortunate fate of oil bearing communities all of which are rooted in historical development of the Nigerian State. Obi (2002) argued that "the most significant of this (factor) till date has been the replacement of agriculture by oil, as the basis of capitalist accumulation and State reproduction in Nigeria".

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According to Obi (2002), by 1965, the export based cash crop economy fell into a crisis resulting from a fall in global commodity prices. This adversely affected the regions as centres of political and economic powers, deriving from their dependence on cash crop exports. Thus, the government of the North and Western regions ran budget deficits as a result of this crisis as noted by (Falola, 1988). As a result, the region began to look to the Federal government for aid so that by the mid-1960s the economic basis of regionalism had begun to wane (Obi, 2002). This period coincided with three very significant events in Nigeria's political history all of which played prominent roles in shaping and structuring the phenomenon of ethnic violence and that of relations in the Niger Delta. These were the discovery of oil in the Niger Delta region complemented by the "new" global want for oil, the Military coup of 1966, and lastly the Nigerian Civil War of 1967.

Empirically, literature exists that had studied the effects of crude oil and gas pollution on soils and crops in the Niger Delta and outside its borders (Bello, Aladesanwa, Akinlabi & Mohammed, 1999; Minai-Tehrani, Shahriari, and Savagbebi, 2007; Abii and Nwosu, 2009; Idodo-Umeh and Ogbeibu, 2010; Ojimba, 2011 among others). Bello, *et al,* (1999) for example examined the effects of gas flaring on the growth and yield of maize on farms located at some distances from gas flaring point. The experimental findings revealed that in the crop total leaf area monitored, mean percentage plant survival and grain yield were significantly reduced in all the locations compared with the controlled area and concluded that farms located 200m away from the flaring point failed to produce any yield. Minai-Tehrani, *et al,* (2007) observed the effects of different concentrations of light crude oil on the growth and germination of *festuca arundicea* (tall fescue) and the results showed that the germination number and dry biomass of the plant decreased by increasing light crude oil concentration in the soil. The light of the leaves reduced in higher crude oil concentration compared to the controlled.

Ikelgbe (1993) reveals that gas flaring sites around the western Niger Delta generates tremendous heat which is felt over an average radius of 0.5 km, thereby causing thermal pollution in the sub-region. Alakpodia (1990), carried out measurement around several flare sites, temperatures were as high as 40^{o}C. Indeed the high temperatures around the gas flare sites are an indication that a distinct microclimate has been created by gas flaring.

Abii and Nwosu (2009) studied the effect of oil spillage on the soil of Eleme in Rivers State of Nigeria on two sides. While another area (Aleto) served as the controlled. The results indicated that oil spillage adversely affected the nutrient level and fertility status of the Eleme soil. Idodo-Umeh and Ogbeibu (2010) investigated the values of Total Petroleum Hydrocarbon (TPH) and heavy metals in soils, plantain fruits and cassava tubes harvested from farms impacted with petroleum and non-petroleum activities in Delta State, Nigeria. The results revealed that the values of heavy metals were higher in cassava tubers, epicap and mesocap of plantation fruits harvested from petroleum impacted soil than from non-petroleum impacted soils. Ojimba (2011) evaluated the social-economic variables associated with poverty in crude oil polluted crops farms in Rivers State. The study used a primary data (questionnaires) and employing tobit censored regression found that extent of income diversification reduced poverty drastically by 9.8 times in crude oil polluted farm-households and 12.7 times in non-polluted farm-households. Other variables identified in reducing poverty in crude oil polluted farms include land ownership by inheritance, years of farming experience, access to extension services and farm labour (Ojimba, 2011).

Nigeria flares 17.2 billion^{3} m of natural gas per year in conjunction with the exploration of crude oil in the Niger Delta (Global Gas Flaring Reduction Initiative [GGFR], 2002). This high level of gas flaring is equal to approximately one quarter of the current power consumption of the African continent (GGFR 2002). This problem has been produced by a range of international oil companies which have been in operation for over four decades (Africa News Service, 2003). The economic and environmental ramifications of this high level of gas flaring are serious because this process is a significant waste of potential fuel which is simultaneously polluting water, air, and soil in the Niger Delta (Ishone, 2005, Atubi and Ogbija, 2015).

Study Area

Delta State lies roughly between Longitude 5°00 and 6°.45' East and Latitude 5°00 and 6°.30' North. It is bounded in the North by Edo State, on the East by Anambra State, on the South-East by Bayelsa State, and on the Southern flank is the Bight of Benin which covers approximately 160kilometresof the State's coastline (see Fig. 1).

Delta State is generally low lying without remarkable hills. The State has a wide coastal belt inter-lace with rivulets and streams, which form part of the Niger-Delta. The State capital is Asaba, a developing town located at the River Niger to the Northern end of the State. It has a net-work of good roads; and a master plan for transforming it into a modem city has been established by the State Government.

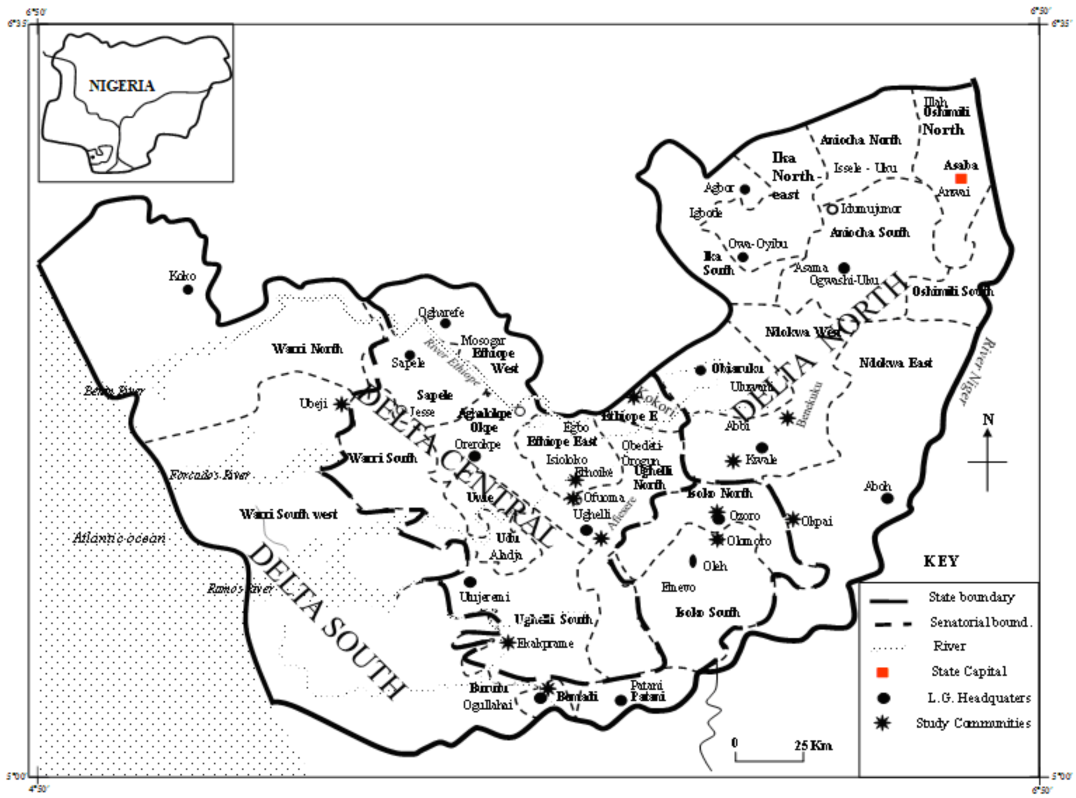

Fig 1: Map of Delta State Showing Study Areas

Research Methods

The data used for this study was obtained from both primary and secondary sources. The primary data was required from field data generated through administration of questionnaires. However, the data for oil spillage was collected from the archive of the National oil spill Detection and Response Agency (NOSDRA), while the gas flaring data was collected from the Nigerian National Petroleum Corporation (NNPC) in Warri. The statistical tool employed in this study is the cluster and SPSS version 16.0 of multiple regression analysis. The multiple regression analysis has been applied in researches by Atubi (2011 and 2012), Nkwocha, Pat-Mbano and Tony-Njoku (2011), Atubi and Ogbija (2015) and they all achieved significant results.

Discussion of Results

Table 1 and fig 2 showed that the respondents in the oil producing communities to a large extent have experienced and still experiencing environmental degradation. Accordingly, the responses were affirmative for Okpai (89%), Kwale (100%), Benekuku (82.5%), Erhoike (95.6%), Afiesere (100%), Ekakprame (100%), Ubeji (100%), Uzere (100%) and Bomadi (89%) respectively. This implies that environmental degradation is a key concern for the citizens of the oil producing communities where oil, a major contributor to Nigeria's economic GDP is located. While this leave the people more impoverished and agitated is not new as several researchers have classified the Niger Delta as where the Vulture feeds, and leaves her carcass. This means that amnesty programme without fixing the degraded environment is just a palliative measure to curbing the agitation of the people of the oil producing areas.

Table 1: Experience of Environmental degradation in community

Communities	Respondents	
	Yes	No
Okpai	40 (89%)	5 (11%)
Kwale	45 (100%)	0 (0%)
Benekuku	33 (82.5%)	7 (17.5%)
Erhoike	22 (95.6%)	1(4.4)
Afiesere	45 (100%)	0 (0%)
Ekakprame	45 (100%)	0 (0%)
Ubeji	43 (100%)	0 (0%)
Uzere	42 (100%)	0 (0%)
Bomadi	40 (89%)	5(11%)
Total	**355 (95.2%)**	**18 (4.8%)**

Source: Fieldwork, 2013

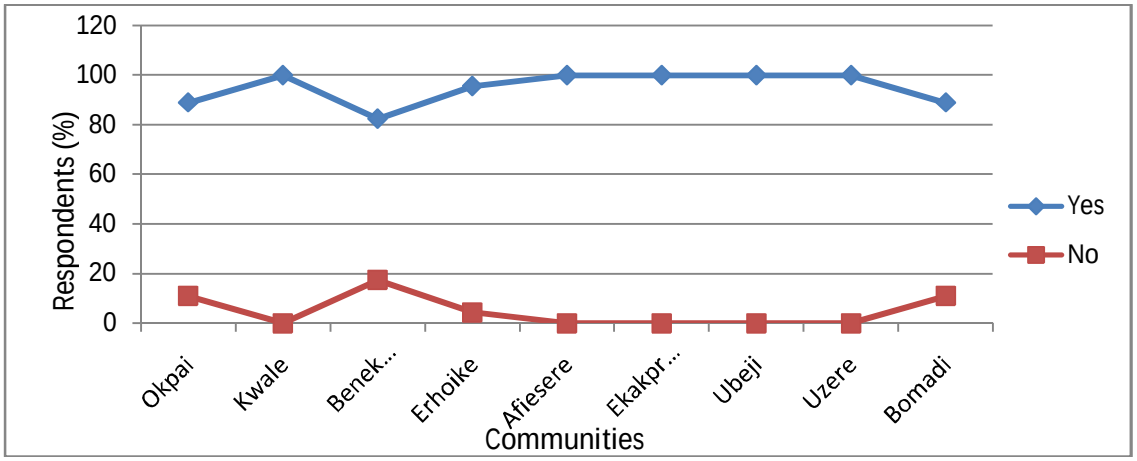

Fig 2: Experience of environmental Degradation

Table 2 and fig 3 showed that environmental degradation of various sort are prevalent in oil producing communities of Delta State. The percentage mean of all responses from the respondents in the nine oil communities being studied revealed that flooding/bad roads is the most popular degradation to the environment with 82.5% agreement across all communities. The next most environmental degradation factor is the destruction of vegetation and farmlands by oil companies with 57.1% and gas flaring (53.6%). Others, in the order of degradation are oil spillage (49%), air pollution from oil and gas processing (43.3%), destruction of seabed by dredging activities (40.7%), water pollution from effluents from oil companies (28.9%), deck drainage and spillage during loading operations (16.7%), land pollution from effluents from oil companies (15.6%), noise pollution from vibration seismic shooting of oil companies (12.4%), Water pollution from effluents (10%) and accumulation of solid waste from drilling materials (5.1%) respectively.

Table 2: Types of Environmental Degraders Experienced

Communi-ties	Environmental degradation common to community											
	OS	GF	DVF	NP	ATW	AP	WP	DDSLO	LP	DSD	WPEC	FBR
Okpai	0	45	45	0	0	41	0	0	0	0	0	45
Kwale	45	45	40	15	23	0	0	40	35	40	0	45
Benekuku	0	40	0	0	0	0	0	0	0	0	0	40
Erhoike	0	23	23	0	0	23	0	0	0	23	0	23
Afiesere	0	0	0	0	0	0	0	0	0	40	0	45
Ekakprame	45	0	27	0	0	45	0	0	0	45	0	45
Ubeji	43	43	40	41	0	43	0	0	0	0	43	43
Uzere	42	0	42	0	0	0	0	0	0	0	42	42
Bomadi	45	45	40	0	0	43	45	35	35	35	45	45
Total	**220 49%**	**241 53.6%**	**257 57.1%**	**56 12.4%**	**23 5.1%**	**195 43.3%**	**45 10%**	**75 16.7%**	**70 15.6%**	**183 40.7%**	**130 28.9%**	**373 82.9 %**
Mean	**24.4**	**26.8**	**28.6**	**6.2**	**2.6**	**21.7**	**5**	**8.3**	**7.8**	**20.3**	**14.4**	**41.4**

Source: Fieldwork, 2013

OS- Oil Spillage
GF- Gas Flaring
DVF- Destruction of vegetation & Farmlands
NP- Noise Pollution from Vibration seismic shooting of oil companies
ATW- Accumulation of toxic waste frim drilling
AP- Air pollution from gas & oil processing
WP- Water Pollution from ballast & tank washing
DDSLO- Deck drainage & spillage during loading operations
LP- Land pollution from effluent water
DSD- Destruction of seabed by Dredging
WPEC- Water Pollution from Effluents
FBR- Flooding/bad roads

From table 3 and fig 4, the overall major cause of environmental degradation in all the oil producing communities is the negligence of duty by government agencies charged with oversight duties of monitory and compliance (30.8%), Neglect of Environmental regulations/compliance (26.8%), corruption (23.6%), Lack of Environmental Impact Assessment (EIA) reports from Companies either at the beginning of the project or periodic assessment (14.7%) respectively. However, 4% of all respondents spotted Lack of Environmental laws as the least problem causing environmental degradation in the areas. The implication of this is that attitudinal change will help on the long run to stop or minimize environmental degradation in the region.

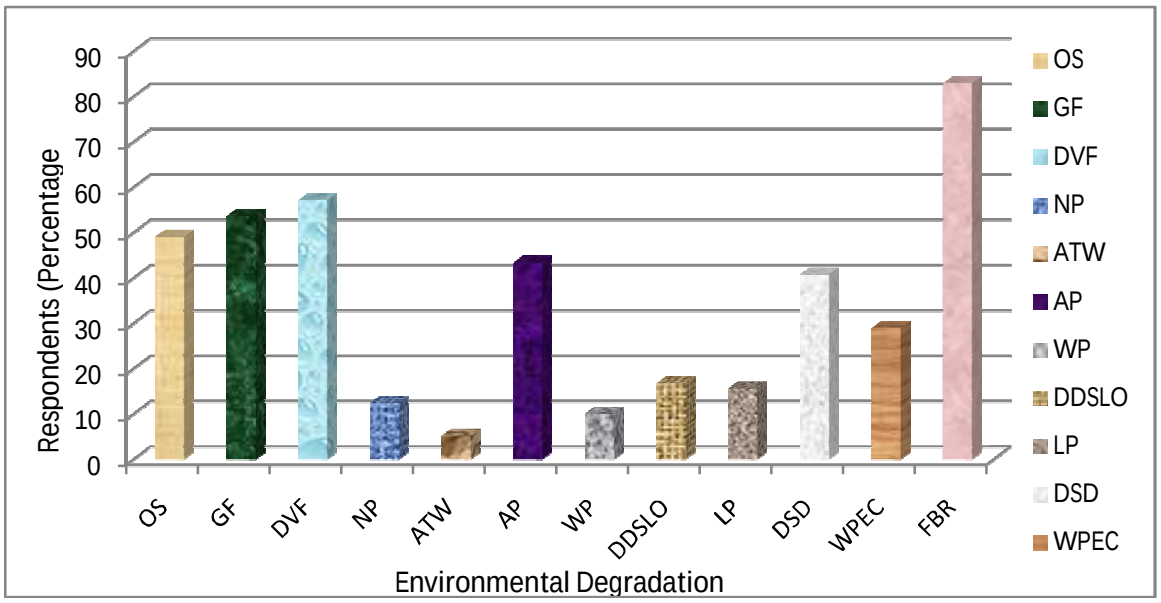

Fig 3: Featured Environmental Degradation Common to Oil Communities in Delta State.

Table 3: Major Cause of Environmental degradation in communities

Communities	Respondents				
	Lack of Environmental laws	**Negligence of duty by government agencies**	**Lack of EIA reports from Companies**	**Neglect of Environmental regulations/compliance**	**Corruption**
Okpai	0 (0%)	20 (44.4%)	12 (26.7%)	10 (22.2%)	3 (6.7%)
Kwale	5 (11.1%)	10 (22.2%)	3 (6.7%)	17 (37.8 %)	10 (22.2%)
Benekuku	1 (2.5%)	15 (37.5%)	9 (22.5%)	10 (25%)	5 (12.5%)
Erhoike	2 (8.7%)	15 (65.2%)	0 (0%)	3 (13%)	3 (13%)
Afiesere	1 (2.2%)	4 (4.4%)	0 (0%)	10 (22.2%)	30 (66.7%)
Ekakprame	0 (0%)	18 (40%)	2 (4.4%)	20 (44.4%)	5 (11.1%)
Ubeji	3 (6.9%)	18 (41.9%)	2 (4.7%)	10 (23.3%)	10 (23.3%)
Uzere	3 (7.1%)	10 (23.8%)	17 (40.5%)	10 (23.8%)	2 (4.8%)
Bomadi	0 (0%)	5 (11.1%)	10 (22.2%)	10 (22.2%)	20 (44.4%)
Total	**15 (4%)**	**115 (30.8%)**	**55 (14.7%)**	**100 (26.8%)**	**88 (23.6%)**
Mean	**1.7**	**12.8**	**6.1**	**11.1**	**9.8**

Source: Fieldwork, 2013

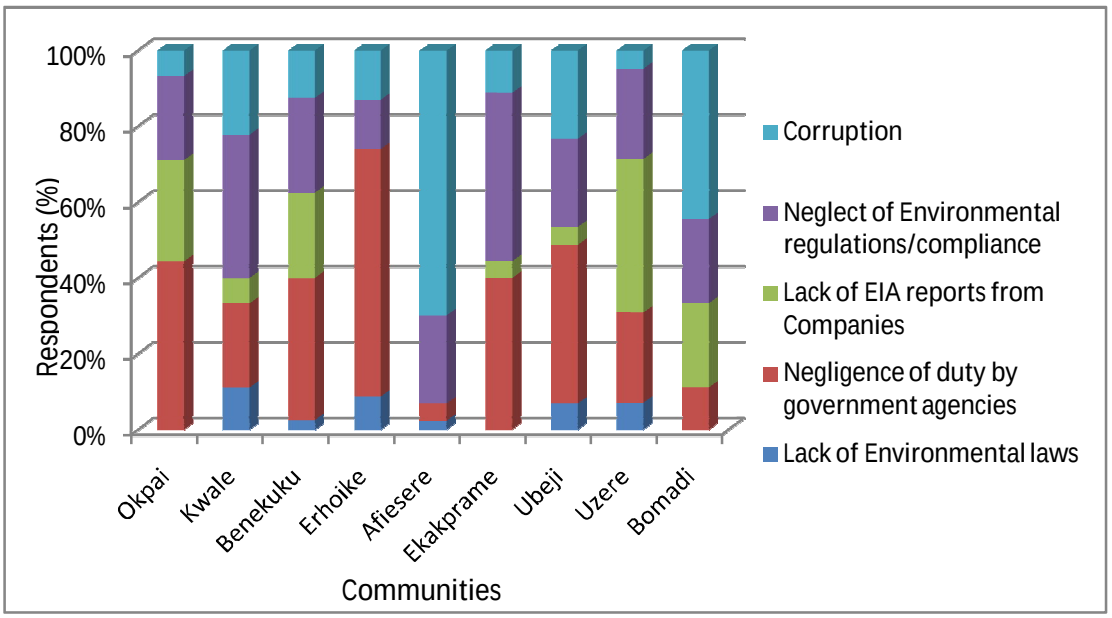

Fig 4: Major cause of Environmental Degradation in communities

Table 4 above shows the oil spillage data from oil producing communities in Delta State which occurred in our area of study or close by to the area of study. From the table, the greatest spillage occurred in 12" Kokori Eriemu line at Agbarra when 306.14 billion barrel of crude was spilled through sabotage and the least was in Ogini Well 7 L/S where 0.0129 billion barrels occurred as a result of sabotage. In fact from the table, most of the oil spillages are traceable to sabotages.

Table 4: Selected Oil Spillage Occurrence in Delta State Oil producing Areas

S/N	Location of Spill	Cause of Spill	Quantity of Spill (bbl)	Rank
1	Utorogu- Otu-jeremi	Sabotage	25	7
2	Tunu Well	Eqf & Sab	6	18
3	Jones Creek	Eqf	2	26
4	Ogini Well 14 L/S	Sab	0.5661	30
5	Erienu	Sab	5.1	20
6	Kokori Flow station line	Sab	1	28
7	Otumara Flow Station	Eqf	0.0352	35
8	Afiesere Well 29 T Row	Sab	225.811	2
9	Ogini Well 7 L/S	Sab	0.0129	37
10	Olomoro well 8 Row	Sab	0.327	32
11	24" Amukpe- Rapele @ Jakpa	Eqf	1	29
12	20" UPS-WRPC T/L @ Ekpan	Sab	0.025	36
13	20" UPS-WRPC T/L @ Ugbomro	Sab	0.22	34
14	Uzere Well 14	Sab	15	9
15	Uzere Well 17	Sab	10	11
16	Well 8L4" Flowline @ Otumara	Eqf	1.79	27
17	10" Utorogu Up ST/L @ Iwhrekan	Eqf	8.91	16
18	10" Utorogu Up ST/L @ Ughevwugie	Eqf	3.51	24
19	10" Utorogu UP ST/L @ Ughevwugie2	Eqf	2.49	25
20	Otumara Well 6 Flowline (4" pipe)	Sab	33.52	6
21	24" Amukpe- Rapele TL @ Orere Uluba	Sab	0.23	33
22	10" Utorogu Ups T/L @ Ughevughe	Eqf	14.38	10
23	8" Oroni to Evwreni T/L @ Enhwe	Sab	48.85	5
24	Kanbo well 5	Sab	0.35	31
25	12" Kokori Eriemu line @ Agbarra	Sab	306.14	1
26	16" South Forcados @ Oviriolomu	Cor	18.68	8
27	Kwale	Sab	5	21
28	Kwale	Sab	10	12
29	Irri/Kwale Pipeline @ Ofagbe	Sab	5	22
30	Beneku Area (Kwale)	Sab	10	13
31	Okpai 7L4" flowline	Sab	10	14
32	10" Kwale/Akri P/L @ Agwa Etiti	Sab	6	19
33	Okpai 12" F/L @ Beneku	Sab	5	23
34	10" Irri/Kwale P/L @ Ofagbe	Sab	10	15
35	Okpai 7L4" F/L	Sab	7	17
36	10" Irri/Kwale P/L @ Ofagbe	Sab	180	3
37	10"Kwale/ Akri @ Agwa Etiti	Sab	95	4

Source: National Oil Spill Detection and Response Agency (NOSDRA), 2013

- Sab= sabotage; Eqf= equipment fault; Cor= corrosion, @=at

Table 5 revealed that in the oil producing communities in Delta State, about 69.3% of all the gas produced were flared during the study period. It was as high as over 95% in most communities like Agbara, Uzere East and West, Ughelli West, Ovhor, Opukushi.

Table 5: Gas flaring in Delta State Oil Producing Areas

S/N	Name of Field	Gas Produced (mscf)	Gas Flared (mscf)	% Flared
1	Afiesere	3,257,632	844193	25.9
2	Eriemu	188,370	174072	92.4
3	Ewreni	271,064	252170	93.0
4	Olomoro/Oleh	4,707,174	1759593	37.4
5	Opukushi North	979,368	972890	99.3
6	Oweh	624,959	595484	95.3
7	Otumara	6,576,132	2903750	44.2
8	Ughelli East	16,708,684	819396	4.9
9	Ughelli West	909,095	888777	97.8
10	Utorogu	89,264,465	1646150	1.8
11	Uzere East	1,067,224	634477	59.5
12	Uzere West	713,191	421667	59.1
13	Akri	20,286,275	16815139	82.9
14	Kwale	77,705,154	61546853	79.2
15	Agbara	9,663,197	9356457	96.8
16	Afiesere/Eriemu	57,124,000	31617000	55.3
17	*Afiesere	1,218,291	351687	28.9
18	Ewreni	260,742	248355	95.2
19	Isoko	180,454	162025	89.8
20	Olomoro/Oleh	2,238,131	943583	42.2
21	Opukushi North	536,490	532953	99.3
22	Opukushi	2,305,714	2283677	99.0
23	Otumara	3,538,279	2523320	71.3
24	Ovhor	434,111	431946	99.5
25	Oweh	176,655	163650	92.6
26	Ughelli East	15,739,129	1995010	12.7
27	Ughelli West	966,910	2515854	98.0
28	Uturogu	93,661,230	709516	2.7
29	Uzere East	749,732	947936	94.6
30	Uzere West	596,238	589546	98.9
31	Agbara	6,713,476	6672816	99.4
	% Mean (flared gas)			69.3%

Source: Extracted From NNPC Annual Statistical Bulletin, 2013.
***mscf = thousand standard cubic feet**

In table 6, the model showed that a strong positive linear relationship exist between the dependent variable (crop farming) and independent variables (disconnection from former source of livelihood, flooding/bad roads, destruction of vegetation and farmlands, destruction of seabed by dredging and water pollution from effluents). The value *R* is 0.700 and the *R-square value (*coefficient of determination, is the squared value of the multiple correlation coefficient*)* is 0.490. The R Square value implies that disconnection from former source of livelihood, flooding/bad roads, destruction of vegetation and farmlands, destruction of seabed by dredging and water pollution from effluents variables combined explained 49 percent of the changes observed in crop farming, this is however a fairly significant influence.

Table 6: Model Summary[b] Case of crop farming

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.700[a]	.490	-.360	5.08242	.490	.577	5	3	.002	2.641

a. Predictors: (Constant), Disconnected from former source of livelihood, Flooding/bad roads, Destruction of vegetation & Farmlands, Destruction of seabed by Dredging, Water Pollution from Effluents

b. Dependent Variable: Crop farming

In table 7, the model regression analysis, predicting crop farming from environmental degradation outcomes, was statistically significant, F (5, 3) = 0.577, $p < .05$,(i.e. $p = .002$). For every one unit increase in environmental degradation outcomes, there is a corresponding increase in the effects on crop farming.

Table 7: ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	74.507	5	14.901	.577	.002[a]
	Residual	77.493	3	25.831		
	Total	152.000	8			

a. Predictors: (Constant), Disconnected from former source of livelihood, Flooding/bad roads, Destruction of vegetation & Farmlands, Destruction of seabed by Dredging, Water Pollution from Effluents

b. Dependent Variable: Crop farming

In table 8, the model showed a strong positive linear relationship exist between the dependent variable (fish farming) and independent variables (disconnection from former source of livelihood, flooding/bad roads, destruction of vegetation and farmlands, destruction of seabed by dredging and water pollution from effluents). *R* is 0.947 and *R-square (*coefficient of determination, is the squared value of the multiple correlation coefficient*)* is 0.897. The R Square value implies that disconnection from former source of livelihood, flooding/bad roads, destruction of vegetation and farmlands, destruction of seabed by dredging and water pollution from effluents variables combined explained 89.7 percent of the changes observed in fish farming, this is however a high and large significant influence leaving 10.3% as the unexplained effect due to some other factors.

Table 8: Model Summary[b] Case of Fish farming

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.947[a]	.897	.725	3.40643	.897	5.218	5	3	.012	2.652

a. Predictors: (Constant), Disconnected from former source of livelihood, Flooding/bad roads, Destruction of vegetation & Farmlands, Destruction of seabed by Dredging, Water Pollution from Effluents

b. Dependent Variable: Fish Farming

In table 9, the model regression analysis, predicting fish farming from environmental degradation outcomes, was statistically significant, F (5, 3) = 0.521, $p < .05$,(i.e. $p = .012$). For every one unit increase in environmental degradation outcomes, there is a corresponding increase in the effects on fish farming.

Table 9: ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	302.744	5	60.549	5.218	.012[a]
	Residual	34.811	3	11.604		
	Total	337.556	8			

a. Predictors: (Constant), Disconnected from former sourse of livelihood, Flooding/bad roads, Destruction of vegetation & Farmlands, Destruction of seabed by Dredging, Water Pollution from Effluents

b. Dependent Variable: Fish Farming

In table 10, the model showed a moderate positive linear relationship exist between the dependent variable (trading) and independent variables (disconnection from former source of livelihood, flooding/bad roads, destruction of vegetation and farmlands, destruction of seabed by dredging and water pollution from effluents). *R* is 0.607 and *R-square (*coefficient of determination, is the squared value of the multiple correlation coefficient*)* is 0.369. The R Square value implies that disconnection from former source of livelihood, flooding/bad roads, destruction of vegetation and farmlands, destruction of seabed by dredging and water pollution from effluents variables combined explained 36.9 percent of the changes observed in trading activities, this is however a very low influence.

Table 10: Model Summary[b] Case of Trading

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.607[a]	.369	-.683	7.60435	.369	.351	5	3	.856	3.058

a. Predictors: (Constant), Disconnected from former sourse of livelihood, Flooding/bad roads, Destruction of vegetation & Farmlands, Destruction of seabed by Dredging, Water Pollution from Effluents

b. Dependent Variable: Trading

In table 11, the model regression analysis, predicting trading from environmental degradation outcomes, was not statistically significant, F (5, 3) = 0.351, $p > .05$,(i.e. $p = .856$). For every one unit increase in environmental degradation outcomes, there is a no corresponding increase in the effects on trading.

Table 11: ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	101.410	5	20.282	.351	.856[a]
	Residual	173.479	3	57.826		
	Total	274.889	8			

a. Predictors: (Constant), Disconnected from former sourse of livelihood, Flooding/bad roads, Destruction of vegetation & Farmlands, Destruction of seabed by Dredging, Water Pollution from Effluents

b. Dependent Variable: Trading

In table 12, the model showed a high positive linear relationship exist between the dependent variable (office jobs) and independent variables (disconnection from former source of livelihood, flooding/bad roads, destruction of vegetation and farmlands, destruction of seabed by dredging and water pollution from effluents). *R* is 0.964 and *R-square (*coefficient of determination, is the squared value of the multiple correlation coefficient*)* is 0.930. The R Square value implies that disconnection from former source of livelihood, flooding/bad roads, destruction of vegetation and farmlands, destruction of seabed by dredging and water pollution from effluents variables combined explained 93 percent of the changes observed in trading activities, this is however a very high influence.

Table 12: Model Summary[b] Case of Office Jobs

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.964[a]	.930	.814	3.59373	.930	8.003	5	3	.059	2.952

a. Predictors: (Constant), Disconnected from former sourse of livelihood, Flooding/bad roads, Destruction of vegetation & Farmlands, Destruction of seabed by Dredging, Water Pollution from Effluents

b. Dependent Variable: Office Jobs

In table 13, the model regression analysis, predicting office jobs from environmental degradation outcomes, was not statistically significant, F (5, 3) = 8.003, $p > .05$,(i.e. $p = .059$). For every one unit increase in environmental degradation outcomes, there is a no corresponding increase in the effects on office jobs.

Table 13: ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	516.811	5	103.362	8.003	.059[a]
	Residual	38.745	3	12.915		
	Total	555.556	8			

a. Predictors: (Constant), Disconnected from former source of livelihood, Flooding/bad roads, Destruction of vegetation & Farmlands, Destruction of seabed by Dredging, Water Pollution from Effluents

b. Dependent Variable: Office Jobs

Policy Implications/Recommendations

The Federal Government through the Federal Ministry of Environmental Protection Agency (FEPA), Niger Delta Affairs Ministry, NOSDR and all Policy stakeholders in environment and oil and gas sector should revisit and review existing environmental and oil drilling laws in Nigeria with a view of updating them to international and environmental friendly standards. Strict implementation of oil drilling related laws by the government and appropriate bodies with elimination of corruption and bureaucratic bottleneck is recommended. There should also be a modification in the current regulatory framework of gas flaring and holistic approach to the environment of planning, development and management of land resources.

The Federal Government policy on zero flare by July, 2008 should be put to place and not a mere policy statement. This could be done by the utilization of the gas being flared through re-injection process during oil production, and construction of gas plants for electricity generation and harness the flared gas for both private and commercial uses.

There should be appropriate compensation by the multinational oil companies to the bearing communities, also to see to their socio-economic well-being. All the equipment used by the oil companies should be up dated and modernized to international standards. Thus, a technology that will enable complete combustion of the gases is important. This will reduce the production and decomposition of some nitrogen oxides, carbon, sulphur and soot oxides.

The companies and government should provide relief assistance to the bearing communities as regards to the provision of basic input such as fertilizers to the various farmers as to enable them to produce enough food crops as their only mainstay of livelihood and compensation should be paid to host communities. The Federal Government should ensure that all decisions relating to environmental quality integrate the need for sustainable development for future generation.

Government should in the place of amnesty develop the region as people who are taking out of their environment to acquire skills elsewhere would one day return home to apply what is learnt and if the environment remains degraded will opt for arms again thereby making the efforts put at amnesty to be a white elephant project.

Conclusion

To achieve the laudable goals of the concepts of eco-development and diversity conservation so as to have a sustainable economic development, the environmental consequences of our resource exploitation efforts must not be ignored. This is because a sound environment is the basis for sustainable development, we must therefore, strive to maintain an equilibrium between activities and the health of the environment.

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