

Impact of Oil Drilling Operations on Forest Resources in Obagi, Niger Delta Nigeria

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Abstract: The issue of oil drilling operation and its impact on forest resources in Obagi and other oil producing communities has over time been a challenge facing oil producing areas. This study therefore is necessitated to identify and evaluate the changes that have taken place overtime on forest resources arising from oil drilling operation. It was to examine and establish if the damage of ecosystem and loss of bio-resources is as a result of drilling operation in the area. A total of 135 persons were interviewed as sample population for the study. The result of findings of the study showed that oil drilling operation has no significant impact on ecosystem damage, ecosystem disruption, specie extinction and decline rather than to a significant extent that there are other factors which play in the damage of ecosystem and loss of forest resources in the area, amongst them as found by the study are the introduction of exotic species, intensive farming, deforestation for construction purposes all these as found by the research in one way or the other affects the balance in the ecosystem.

Key words: Deforestation, ecosystem damage, forest resources, oil drilling operations, specie extinction

INTRODUCTION

Over the past two decades, environmental degradation, including land degradation has continued to contribute to poverty and food insecurity as a result of oil exploration and production activities in the Niger Delta. Conversely, awareness of the importance of the environment and its conservation has increased. There has been a transformation in people's perception of the poverty problem in developing countries. If one accepts that hard core rural poverty is increasingly a phenomenon associated with marginal lands, then new strategies are required that integrate poverty alleviation and environmental management.

The landmark report of the World Commission on Environment and Development (1999), entitled "Our Common Future", warned that unless we change many of our lifestyle patterns, the world will face unacceptable levels of environmental damage and human suffering. The Commission, echoing the urgent need for tailoring the pace and the pattern of global economic growth to the planet's carrying capacity, said that: "Humanity has the ability to make development sustainable and to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs."

Man in his endeavour to satisfy his needs and aspirations for better living conditions through resource exploitation, has created an increasing number of environmental problems (Harries, 1998). In spite of the "blessings" from oil there are negative impacts on the human and ecological environment (Oyegun, 1997, 1998).

According to Dabbs (1996) most countries depend on oil. States will go to great lengths to acquire an oil production capability or to be assured access to the free flow of oil. History has provided several examples in which states were willing to go to war to obtain oil resources or in defense of an oil producing region. States have even become involved in conflicts over areas which may only possibly contain oil resources. This trend is likely to continue in the future until a more economical resource is discovered or until the world's oil wells run dry. One problem associated with this dependence on oil is the extremely damaging effects that production, distribution, and use have on the environment. Furthermore, accidents and conflict can disrupt production or the actual oil resource, which can also result in environmental devastation.

The United Nations' Human Development Report on the Niger Delta among several alarming declarations on the state of the region's environment asserts that "there is a strong feeling in the region that the degree and rate of degradation are pushing the delta towards ecological disaster" (UNDP, 2006). This feeling is buttressed by results of research.

An impact assessment of the 1983 Oshika oil spill by Powell and White (1985) confirmed the death of floating and submerged aquatic vegetations especially water lettuce, crabs, fish and birds. Atuma and Egborge (1996), NDES (1997), Egborge (2000) Orubu *et al.* (2002), and Otukunefor and Biukwu (2005) have all shown that the pollution levels of aquatic ecosystems observed in the region are a result of unregulated effluent discharges and

unsustainable methods of petroleum extraction. Amakiri (2005) laments the loss of biodiversity, alteration of habitats and deforestation that is associated with petroleum exploitation related canalization. This canalization which is quite extensive in the region opens up previously pristine and inaccessible ecosystems to illegal logging activities. Ndiokwere and Ezehe (1990), also reported high levels of heavy metals in soils and plants near the Warri Refinery. Emoyan *et al.* (2006a, b) have also confirmed high levels of heavy metal contamination of River Ijana - an effluent receiving stream that flows by the same refinery. Braide *et al.* (2000) observed high concentrations of heavy metals in the Miniweja stream in the eastern Niger Delta. Furthermore, Spiff and Horsfall, (2004) reported trace metal contamination of the intertidal flats of the Upper New Calabar River in the Niger Delta. Meanwhile, Rowell (1977), Atuanya (1987), Anoliefo and Vwioko (1994), Anoliefo (1991), Gill *et al.* (1992) and Agbogidi *et al.* (2006) have independent studies, that documented the adverse effects of crude oil, engine oil and spent lubricating oil on soils and the suppression of germination of seeds, regeneration as well as stomata abnormalities in diverse food crops.

A World Bank survey (Grevy, 1995) estimated that about 2.3 million cubic metres of crude oil is spilt in about 300 separate incidents in the region each year; he further stated that oil companies deliberately understate the incidents of oil spillage, and that the total volume of oil spilt might be as much as ten times the official figures. The official figures of SPDC (2004) show that between 1976 and 2001, 6,187 incidents in which 3 million barrels were spilled.

Greater than 70% of this volume went unrecovered (UNDP, 2006). Following Grevy's (1995) assertion, it may be concluded that more than 30 million barrels have been spilled into the delta environment in the same period. The Niger Delta Environmental Survey (NDES, 1997) attributes some of the reasons for the high incidence of spills as the very old age of the pipelines and the lack of regular inspection and maintenance.

Leaks and spills also affect ground water quality. Preliminary results of ongoing ground water quality evaluation around the WRPC show elevated levels of BTEX in shallow boreholes and dug well water (Akpoborie *et al.*, 2008).

This study provides a preliminary analysis to determine if offshore drilling operations affects forest resources.

MATERIALS AND METHODS

The study was conducted in the year 2010 in Obagi town. The entire population of this study comprises all

Table 1: Questionnaire administration

Questionnaire Distribution	Response	%
No. of questionnaire administered	142	100
No. of questionnaire returned	135	95.0

Authors field work (2010)

Table 2: Effect of drilling operation on plants and animal species in the area

Response	Frequency	%
Decline	45	33.3
Extinction	43	31.1
Migration	31	23.0
Others	17	12.6
Total	135	100

Authors field work, 2010

Table 3: Effect of oil drilling operation to ecosystem damage

Response	Frequency	%
Yes	98	72.6
No	37	27.4
Total	135	100

Authors field work (2009)

occupants within the study area. Samples were drawn from all the areas of the town ranging from the men, women and youths who overtime have stayed in the study area. According to census report of 2006 the community has a total of 4,732, 30% of this population was taken as a true representation of the total population. Arising from the above a total of 142 persons were selected as the sample population for the study. Systematic random sampling technique was used to select the sample for the study.

Data for this study was collected using the Systematic random sampling technique. It also made use of questionnaires as the instrument for data collection. The questionnaire consisted of 14 questions which are related to the variables that could damage both plants and animal lives as well as the people as a result of drilling. The questionnaire was designed in the form that it allows the respondents to answer each question (Table 1). The question asked covered the entire Obagi town in relation to their experiences as it concerns the activities of oil exploration.

The Pearson's Product Moment Correlation statistical technique was used to test the hypothesis as to determine if there existed any statistically significant relationship between Oil drilling operations in the area and plants/animal species loss.

From the Table 2, 33.3% of the population agreed that drilling operation has caused the decline in plants and animal specie, while 31.1% stated that it has led to their extinction while 23% stated that it has led to migration of plants and animals to other areas while 12.6% said the are other effects.

As shown in Table 3, 72.6% of the total population responded and confirmed that the present oil drilling operation has tremendous effect on the ecosystem, while 27.4% did not.

Table 4: Extent of effect on forest resources

Response	Frequency	%
To a great extent	78	57.8
To no extent	37	27.4
Neutral	20	14.8
Total	135	100

Authors field work (2010)

Table 5: Ecosystem destruction for oil drilling operation affects forest resource potential.

Response	Frequency	%
Yes	96	71.1
No	39	28.9
Total	135	100

Authors field work (2010)

Table 6: Major effect of oil drilling operation on forest resources

Response	Frequency	%
Specie extinction	60	44.5
Climate change	4	2.9
Increased erosion	20	14.8
Ecosystem disruption	51	37.8
None	-	-
Total	95	100

Authors field work (2010)

Table 7: Effect of oil drilling operation on socio- economic life

Response	Frequency	%
Yes	106	78.5
No	29	21.5
Total	135	100

Authors field work (2010)

As shown Table 4, 57.8% of the respondents confirmed that the effect of oil drilling operation on forest resources is to a great extent, 27.4% said that it is to no extent and 14.8% were neutral that is the belonged to non of the effect category.

As shown in Table 5, 71.1% of the respondents agreed that Ecosystem destruction for oil drilling operation affects forest resource potential, while 28.9% did not agree.

From the Table 6, 44.5% of the respondents stated that the major effect of oil drilling operation in the area is specie extinction, 2.9% agreed that it can lead to increase the carbon content in the atmosphere, 14.8% said increased erosion and 37.8% said that it is ecosystem disruption.

From Table 7, 78.5% of the respondents confirmed that oil drilling operation in the area has effect on socio-economic life, while 21.5% said it has no effect on the socio-economic life of the people.

RESULTS AND DISCUSSION

$$r_{xy} = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sigma_x \times \sigma_y}$$

$$\bar{X} = 33.75 \quad \bar{Y} = 33.75 \quad \sigma_x = 25.28 \quad \sigma_y = 11.56$$

$$r_{xy} = \frac{0.25 \times 172.82}{25.28 \times 11.56} = \frac{43.21}{292.2}$$

$$r_{xy} = 0.15$$

To test for the significance, we use the students t statistics.

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

$$= \frac{0.15\sqrt{4-2}}{\sqrt{1-(0.15)^2}}$$

$$= \frac{0.15 \times 1.41}{\sqrt{1-0.023}}$$

$$= \frac{0.21}{0.988}$$

$$t = 0.21 \text{ df} = (n-2)$$

$$= 4-2$$

$$= 2$$

Decision rule: Since the t statistics calculated value of 0.21 is less than the critical value of 4.30 at (0.05) confidence level and 2 degree of freedom we therefore do not reject the null hypothesis H_0 and Which holds that there is no statistically significant relationship between Oil drilling operations in the area and plants/animal species loss.

Summary of findings: In view of the analyzed data (questionnaire) for this study. It is imperative to state that out of the 142 questionnaires distributed in the area only 135 were returned for analysis 58.5% of the respondents were males while 41.5% are females, while majority of them are adults from the ages of 18 and above, their educational status polarized around tertiary education which shares 31.8% of the population.

Table 2 showed that 33.3% of the population agreed that drilling operation has caused the decline in plants and animal specie, while 31.1% stated that it has led to their extinction, 23% stated that it has led to migration of plants and animals to other areas and 12.6% said the are other effects.

In Table 3, 72.6% of the total population responded and confirmed that the present oil drilling operation has tremendous effect on the ecosystem, while 27.4% did not.

Table 8: Analysis of Pearson Product Moment Correlation for relationship of Oil drilling Operation and plants/animals specie loss

X	Y	x-x	y-y	(x-x) ²	(y-y) ²	(x-x)(y-y)
45	20	11.25	- 13.75	126.6	189.1	- 154.69
43	32	9.25	- 1.75	85.6	3.06	- 16.19
31	75	- 2.75	41.25	7.56	1701.6	- 113.4
16	8	- 17.75	- 25.75	315.0	663.1	457.1
135	135		534.8	2556.9	172.82	

Pearson Product moment correlation coefficient,

Table 4, 57.8% of the respondents confirmed that the effect of oil drilling operation on forest resources is to a great extent, 27.4% said that it is to no extent and 14.8% were neutral that is the belonged to non of the effect category.

According to Table 5, 71.1% of the respondents agreed that Ecosystem destruction for oil drilling operation affects forest resource potential, while 28.9% did not agree.

Results from Table 6, 44.5% of the respondents stated that the major effect of oil drilling operation in the area is specie extinction, 2.9% agreed that it can lead to increase the carbon content in the atmosphere, 14.8% said increased erosion and 37.8% said that it is ecosystem disruption. Conclusively, Table 7 above showed that, 78.5% of the respondents confirmed that oil drilling operation in the area has effect on socio-economic life, while 21.5% said it has no effect on the socio- economic life of the people.

From the analysis of the study, (Table 8) it is observed that oil drilling operation has no significant impact on ecosystem damage, ecosystem disruption, specie extinction and decline.

In summary, Obagi has been a major contributor of about 70% of gas and 40% of oil of the Nigeria total oil output. Obagi as an oil and gas producing community has derived some communal and individual benefits such as provision of electricity, pipe born water, roads, health or medical services and educational facilities. Other benefits include employment, scholarship and compensations to some of the damages done to the communities of Obagi.

This essence of the research basically, is to determine the impact of oil drilling operations on forest resources in Obagi community in Ogba/Egbema Ndoni local Government Area. Over the years many researchers have carried out various studies which suggested that oil drilling operation has significant impact on ecosystem damage and forest resources, without putting into consideration the role played by other factors that could cause the same. The researcher has not rule out completely that oil drilling operations can not be responsible for ecosystem damage, forest resources loss e.t.c, but emphasizes that so many other factors can be responsible for such damages. This factors as identified by the study are the introduction of exotic species, intensive farming and hunting, deforestation for construction purposes all these as found by the research in one way or the other affects the balance in the ecosystem.

RECOMMENDATION

Based on the research, the following recommendations are put forth.

- Oil companies in line with their operations should ensure that their activities are environmentally friendly and that it follows laid down regulations.
- The excessive use of natural resources should be curtailed as this is mainly affecting the state of the resources.
- Legislations should be put in place and strictly implemented as to safe guard our forest as the sustenance of life to a great extent depends on it.

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