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Correlates and Consequences of Oil Pollution in Niger Delta, Nigeria

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Abstract:

This study investigated the correlates and consequences of oil pollution in Niger Delta, Nigeria. The objectives of the study were to determine the forms of oil pollution in Nigeria's Niger Delta, the causes of oil pollution and the consequences of oil pollution. Survey design was adopted in the study. The study population consisted of all offshore oil and gas workers in selected petroleum companies operating in Nigeria's Niger Delta which totaled 920. A total of 368 workers were selected using the stratified proportionate sampling technique. A validated questionnaire reflecting the correlates and consequences of oil pollution was the instrument for data collection. The questionnaires were administered on the respondents over a period of seven (7) alternate days. Analysis of data for field survey was done using descriptive and inferential statistics. Microsoft Excel and the Statistical Package for Social Sciences (SPSS) software were employed in the study. Results were presented in tables. Findings revealed that oil spillage, gas flaring, petroleum wastes, condensates and residuals are the major forms of oil pollution in Niger Delta; environmental oil pollution is caused by oil theft/sabotage, pipeline leakage/explosion, oil siphoning, and militancy and tanker accident. Oil pollution exerts negative consequences on human and animal life as well as overall existence and survival. The consequences of oil pollution include health risk, damage to the ecosystem, food security problems, poverty as well as destruction of plant and animals. The need for enactment of laws and implementation of policies towards preventing environmental breakdown from oil and gas operations was recommended

Keywords: *Correlates, consequences, pollution, oil pollution, Niger Delta Nigeria*

1. Introduction

The petroleum industry occupies an important position in the socio-economic growth and development of Nigeria. In fact, the oil and gas sector has gained more relevance than any other industrial endeavours in Nigeria over the last few years. Since the unearthing of petroleum and related products in different parts of Nigeria especially the Niger Delta region, urban and rural communities have continued to experience perturbations in their ecosystems associated with oil pollution. By way of definition, environmental oil pollution is the introduction of harmful and unpleasant oil and gas products, byproducts and related petrochemicals into the ambient environment. The major forms of oil pollution in Niger Delta include spillage, gas flaring and discharge of drilling waste into the environment (Ugboma, 2015).

Oil spillage is an inadvertent discharge of oil into ground, surface and related water sources by way of release from tankers, petroleum drilling and pipelines passing under water. According to Noko (2017), the causes of oil spillage could be natural or human. The natural causes are nature and weather condition associated while the human causes include human carelessness in form of petroleum theft, damage and draining off of oil and gas products as well as accidents in petroleum products transportation (Noko, 2017). Enormous spill of oil is most time due to oil and gas handling procedures and takes a high toll of the environment (Nwilo & Badejo, 2005). Environmental oil pollutants contains toxic substances such as nitrogen –oxides, aromatics and related substances that could predispose individuals, families and groups in the society to health risks, shortage of food and general environmental breakdown.

Another form of oil pollution that has received so much attention in recent times is gas flaring. Flaring of gas is the smoldering of oil and gas materials that when processed would have been put into other use. The burning process constitutes a major pollutant to Nigeria's Niger Delta environment (Banji & Okoosi, 1995). Though global gas flare rate stands at about 4% (Ugboma, 2015), reports reveal an estimated gas burning locations of 123 in Niger Delta region (Kaddafi, 2012). For this reason, Ugboma (2015) documented that Nigeria contributes about twenty five percent the

world's oil and gas flaring (Ugboma, 2015). Closely connected to gas flaring as a source of oil pollution is the discharge of drilling wastes (DW) into the environment.

Drilling wastes are derivatives of petroleum of oil and gas well discovery and production process exploration processes. A significant proportion of oil exploration and related operations negatively impact the physical environment and such wastes include completion fluid, stimulation fluid, produced water, oil and water based waste as well as petroleum sludge among other drilling discharges (Drilling Lexicon, 2017). Thus, there is marked environmental squalor associated with oil pollution which the Nigerian government seem to have done little or nothing about. According to Adetunji (2006), all the regulatory guidelines and policies formulated by Nigerian Government to ensure environmental sustainability by preventing pollution of the ecosystem especially by oil and gas activities are rarely implemented. Multinational companies, more particularly have not helped matter in protecting the communities especially the rural areas which they carry out their operation. Oil pollution has taken a significant toll on the survival and livelihood of individuals, families and groups in the Niger Delta region of Nigeria. The average rural residents of the oil producing areas who most time engage in farming and fishing experience colossal loss. Water sources (surface and ground sources) are increasingly being polluted with the increase in oil and gas exploration activities taking place in the Niger Delta region. Spilled oil products pollute soils, rivers, stream, ponds, lakes and other small water sources. Niger Delta water generally has been polluted with spilled petroleum products as well as oil and gas waste discharges (Amnesty International, 2018). The soils are depleted of essential minerals, surface waters are polluted with spilled oil and gas products and the air is polluted with flared gases, a situation which comes with major inimical consequences on the physical health, psychological well being and socio-economic status of the populace. In fact oil polluted related abuse of the ecosystem and breakdown ranks highest as a danger to the continued existence in Nigeria's Niger Delta (Sagay, n.d).

The means of livelihood and survival of residents in Niger Delta especially the rural communities whose mainstay include farming and fishing is threatened as infrastructural facilities for most oil and gas operations pass through farms. Soils polluted by oil contain toxic materials that could poison the animals and plants that depend on the soils for survival. In a good number of rural communities in Niger Delta there is the issue of environmental breakdown by oil pollutants (Akpofure, 2018). However, there is no conclusive evidence on the causes of oil spillage in the affected areas. Based on this premise, this study investigates the correlates and consequences of oil pollution in Niger Delta Nigeria with a view to determining the forms of oil pollution, causes of oil pollution and related consequences.

2. Materials and Method

This study adopted survey as its overall design. This study was conducted in Selected Offshore Oil and Gas Operating companies in Niger Delta, Nigeria. The region is made up of the following states: Rivers, Bayelsa, Delta, Edo, Akwa Ibom, Ondo, Abia, Imo and Cross Rivers. Niger Delta is thickly populated and has over the years become a controversial region on oil and gas pollution issues in Nigeria.

The study population consisted of all offshore oil and gas workers in selected petroleum companies operating in Nigeria's Niger Delta which totaled 920. A total of 368 workers were selected using the stratified proportionate sampling technique. A validated questionnaire reflecting the correlates and consequences of oil pollution was the instrument for data collection. The questionnaires were administered on the respondents over a period of seven (7) alternate days. Analysis of data for field survey was done using descriptive and inferential statistics. Microsoft Excel and the Statistical Package for Social Sciences (SPSS) software were employed in the study. Results were presented in tables

3. Results and Discussion

3.1. Results

S/N	Forms of Pollution	\bar{X}	SD
1	Oil spillage	3.03	0.68
2	Gas Flaring	2.93	0.74
3	Petroleum wastes	2.76	0.80
4	Condensates	2.72	0.68
5	Residuals	2.36	0.72
	Cluster Mean and Standard	2.76	0.72

Table 1: Forms of Oil Pollution in Niger Delta (N=368, Criterion Mean: 2.50)

Table 1 shows the forms of oil pollution to which communities in Nigeria's Niger Delta are exposed. The mean score of 2.76 indicates that the major forms of oil pollution in Niger Delta include oil spillage, gas flaring, petroleum wastes, condensates and residuals.

S/N	Causes of Oil Pollution	\bar{X}	SD
1	Oil theft/sabotage	3.10	0.78
2	Pipeline leakage/explosion	2.83	0.76
3	Oil siphoning	2.93	0.80
4	Militancy	2.84	0.70
5	Tanker Accident	2.83	0.82
	Cluster Mean and Standard	2.91	0.77

Table 2: Causes of Oil Pollution in Niger Delta (N=368, Criterion Mean: 2.50)

Table 2 reveals the causes of oil pollution in Niger Delta. The mean score of 2.91 is an indication that the causes of oil pollution in Niger Delta communities include oil theft/sabotage, pipeline leakage/explosion, oil siphoning, militancy and tanker accident.

S/N	Consequences of Oil Pollution	\bar{X}	SD
1	Health risk	3.13	0.84
2	Damage to the ecosystem	2.87	0.82
3	Food security problems	2.86	0.86
4	Poverty	2.88	0.74
5	Destruction of plant and animals	2.90	0.76
	Cluster Mean and Standard	2.93	0.80

Table 3: Consequences of Oil Pollution in Niger Delta Nigeria (N=368, Criterion Mean: 2.50)

Table 3 shows the consequences of oil pollution in Niger Delta, Nigeria. The mean score of 2.93 reveals that the consequences of oil pollution include health risk, damage to the ecosystem, food security problems, poverty as well as destruction of plant and animals.

4. Discussion

Results from the study revealed that the major forms of oil pollution in Niger Delta include oil spillage, gas flaring, petroleum wastes, condensates and residuals; the causes of oil pollution in Niger Delta communities include oil theft/sabotage, pipeline leakage/explosion, oil siphoning, and militancy and tanker accident. The study findings also showed that the consequences of oil pollution include health risk, damage to the ecosystem, food security problems, poverty as well as destruction of plant and animals. These results are in consonance with the report of Ugboma (2015) that the chief forms of oil pollution include spillage, gas flaring and discharge of drilling waste into the environment. This suggests that crucial source types of oil spillage include oil and gas products/waste, release from tankers, petroleum drilling and pipelines passing under water. The submission of Noko (2017) that the human causes include human carelessness in form of petroleum theft, damage and draining off of oil and gas products as well as accidents in petroleum products transportation also substantiates the results of this study. The results also agree with the assertion of Nwilo and Badejo (2005) that high level spill of oil is most time due to oil and gas handling procedures. Nwilo and Badejo (2005) further stated that environmental oil pollutants contains toxic substances such as nitrogen –oxides, aromatics and related substances that could predispose individuals, families and groups in the society to health risks, shortage of food and general environmental breakdown in line with the findings of this study. The report of Akpofure (2018) that oil pollution exerts negative environmental impact on the society also supports the results of this study.

5. Conclusion

Since the discovery of petroleum in Niger Delta, Nigeria, operations of oil and gas companies in the region have been associated with grave environmental consequences. With a view to solving the problem of oil pollution in the ambient environment, this study on the correlates and consequences of oil pollution has been conducted. The study provided us with crucial results helpful in making the environment safe by ensuring that there are no pollutions from the activities of oil and gas companies in Nigeria's Niger Delta. Based on findings, this study concludes that oil spillage, gas flaring, petroleum wastes, condensates and residuals are the major forms of oil pollution in Niger Delta; environmental oil pollution is caused by oil theft/sabotage, pipeline leakage/explosion, oil siphoning, and militancy and tanker accident. Oil pollution exerts negative consequences on human and animal life as well as overall existence and survival. The consequences of oil pollution include health risk, damage to the ecosystem, food security problems, poverty as well as destruction of plant and animals. The need for enactment of laws and implementation of policies towards preventing environmental breakdown from oil and gas operations is buttressed.

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7. Abbreviations

\bar{X} =Mean

SD= Standard Deviation

DW= Drilling Waste

SPSS= Statistical Package for Social Sciences

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