

Effectiveness of disaster management strategies employed by oil companies and government agencies towards oil pipeline vandalism in selected states in Niger Delta, Nigeria

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ABSTRACT: The effectiveness of disaster management strategies as it relates to oil pipeline vandalism is not a job for one but for all stakeholders in the oil industry, this however necessitated the need for this study which is targeted at examining the effectiveness of disaster management strategies employed by oil companies and government agencies towards oil pipeline vandalism in selected states in the Niger Delta. The study adopted the cross sectional research design where the simple random techniques was adopted as the method for the distribution of the research instrument. The study made use of questionnaire as the research instrument which was distributed to 400 respondents sampled across the selected State, Local Government Areas and Communities but only 392 copies were completely filled and returned for the study. Hypothesis for the study was tested with the aid of the Chi-Square statistical tool. The findings of the study showed that the effectiveness of disaster management strategies adopted by government agencies and multi nationals are less effective, it also revealed that management strategies adopted by the government and its agencies is less effective for prevention/mitigation, for preparedness, response and recovery/rehabilitation activities. The study concluded that the event of vandalism has impacted negatively on the Nigeria oil production as well as economic advantage. At various administrative eras, the more the government develop new strategies to tackle vandalism, the more the vandals devise another means to carry on their activities and that various disaster management strategies adopted by oil companies and government and its agencies are either less effective or ineffective and required a change in strategy. The study however, recommends that; government and multinationals should adopt disaster management strategies that are community based, that integrates the locals in the management of pipeline vandalism to curtail incidences of pipeline vandalism and the need for government and multinational collaborations in determining and framing strategies that are effective using international best practices.

Keywords: Disaster, effectiveness, management strategies, oil, pipeline vandalism.

INTRODUCTION

Incessant pipeline vandalism is one of the major challenges facing Nigeria, especially the Niger Delta Region in recent times. In the early 1990s up to the dawn of military rule in Nigeria, vandals, mainly unemployed youths operating in remote areas and communities, where oil pipelines traversed, punctured the pipes or took advantage of ruptured or leaking pipes to siphon fuel or other petroleum products into drums, plastic containers or storage cans for sale in the "black market". The era recorded quite significant cases of pipeline vandalism. For

instance, between 1993 and 1998, there were 146 cases (Brume, 2007). With the return of democratic governance in 1999, the country witnessed a surge in oil pipeline vandalism. The Special Committee on the Review of Petroleum Products Supply and Distribution, collaborated the above assertion by reporting that there were 497 and 909 cases of pipeline vandalism in 1999 and 2000 respectively (Nigerian National Petroleum Corporation, 2000).

The Niger delta region, one of the richest oil producing areas in Nigeria and the largest wetland in Africa,

estimated to have 37 billion barrels (bb) of oil reserves and 168 trillion cubic feet of gas deposits is the home to oil pipeline vandalism (Omotola, 2009). The Niger Delta oil sector account for over 90% of foreign exchange earnings for Nigeria. However, the region is considered as one of the most oil impacted region in the world due to poor regulated oil activities (Omotola, 2009). A number of factors are said to have contributed to the environmental degradation of the region over the years, which includes gas flaring, industrial pollution, oil spillage etc (Raji and Abejide, 2013). Over the years, crude oil spillage through pipeline vandalism is considered one of the major problems of the region. Rising cases of pipeline vandalism by militant groups have significantly affected sources of revenues of government and oil companies operating in the region. Statistics have shown that Nigeria is losing well over 300,000 barrels per day (bpd) as a result of crude oil pipeline vandalism, which runs into billions of dollars in losses (Nigerian National Petroleum Corporation, 2000). Oil pipeline vandalism has affected almost all facets of livelihood in Nigeria. The effects of oil pipeline vandalism on human lives cannot be exaggerated. Evidences showed that it causes fire disaster with tragic consequences. Lives are lost; children are left without parents, and husbands without wives, or vice versa (Brume, 2007). The survivors manifest health challenges in the form of burns and damaged internal organs, resulting to many of the survivors becoming liabilities, because they are unable to fend for themselves (Onuoha, 2008). The impacts of oil spills and fires on Standard of living are enormous especially on agriculture which is the most dominant activity in Nigeria. According to Evoh (2009), oil spills destroy farmland and crops, rivers and aquatic lives, economically valuable trees and other income generating assets upon which communities depend for their livelihoods. Many communities have therefore become vulnerable to food shortages, health hazards, forced migration and unemployment, as a result of oil spills and fires resulting from pipeline vandalism. The economic cost of pipeline vandalism is vast. Nigerian National Petroleum Corporation (NNPC) opined that between 1999 and 2003, there were four hundred cases of vandalism on company facilities with oil losses amounting to \$1 billion annually. Shell petroleum development company (2006) reported that loss of revenues due to pipeline vandalism was \$61m per day, amounting to a staggering \$9 billion, since January 2006.

Various management strategies employed by government agencies and the oil companies to checkmate the ugly trend, seem not to be producing the desired result in the Niger Delta Region. In the region, there are growing disaster risks of oil spillage, gas flares, and fire explosion from these notorious activities. Therefore, the objective of this study is to examine the effectiveness of disaster management strategies employed by oil companies and government agencies towards oil pipeline vandalism in selected states in Niger Delta, Nigeria.

Hypothesis

The formulated hypothesis stated thus:

H₀: There is no statistical significant difference in the disaster management strategies employed by oil companies and government agencies on oil pipeline vandalism in the selected states in Niger Delta.

H₁: There is statistical significant difference in the disaster management strategies employed by oil companies and government agencies on oil pipeline vandalism in the selected states in Niger Delta.

METHODOLOGY

The simple random sampling method was used in selecting the sample for the study. Using this technique, the three states of study was selected. From among the selected states (3), three Local Government Areas and two communities each was also selected for the study.

The randomly selected states, LGAs and communities are: Bayelsa, Imo and Rivers States; while Sagbama, Yenagoa, and Kolokuma/Okpokuma, Ohaji/Egbema, Oru East, and Oguta, Emohua, Eleme, and Ikwerre, were selected as LGAs for enumeration. The communities selected and their population is shown in Table 1.

A total of 400 respondents were used for the study, this was achieved from using the Taro Yamane formula for sample size determination, hence 400 copies of questionnaire which is the major source of data collection were administered to the respondents using the proportionate sampling technique but only 392 copies were filled completely and returned which was used for the study. This study adopted the use of both primary and secondary sources of data. The data collected were analysed using descriptive statistics.

RESULTS

Effectiveness of disaster management strategies

From Table 2, effectiveness of oil companies' prevention/mitigation strategy revealed that 6.9% of the respondents claimed the prevention/mitigation strategy of oil companies is very effective while 20.0%, 46.6% and 26.5% of the respondents claimed that the prevention/ mitigation strategy of oil companies is effective, less effective and ineffective respectively. Effectiveness of preparedness revealed that 7.7% of the respondents claimed the preparedness strategy of oil companies is very effective while 10.0%, 17.6% and 64.7% of the respondents claimed the preparedness strategy of oil companies is effective, less effective and ineffective respectively. The finding revealed that 6.4% of the respondents claimed the response strategy of oil companies is very effective while 8.7%,

Table 1. Population of the study and sample size determination.

Communities of study	1991 Population (NPC)	Projected Population (2020)	Distribution of the Questionnaire
Imo State			
Awarra	13,726	34,727	26
Mmahu	3,239	8,195	6
Eziorsu	3,286	8,314	6
Izombe	11,382	28,797	22
Ofekatta	4,253	10,760	8
Awomamma	3,255	8,235	6
Rivers State			
Elele-Alimini	10,383	26,269	20
Rumuji	6,719	16,999	4
Elele	32,709	82,754	61
Apani	5,099	12,901	10
Alode	7,236	18,307	14
Aleto	7,322	18,525	14
Bayelsa State			
Kaima	8,754	22,148	17
Kalama/Sampoo	571	1,445	2
Agbere	9,482	23,990	18
Sagbama	86,859	219,753	161
Kalaba	825	2,087	2
Ikarama	1036	2,621	3
Total		546,827	400

Source: National Population Commission, 2019 and Researchers Computation.

22.4% and 62.5% of the respondents claimed the response strategy of oil companies is effective, less effective and ineffective respectively. The recovery/ rehabilitation strategy revealed that 3.1% of the respondents claimed the strategy of oil companies is very effective while 6.6%, 21.7% and 68.6% of the respondents claimed the recovery/rehabilitation strategy of oil companies is effective, less effective and ineffective respectively.

Table 3 revealed that 8.4% of the respondents claimed the prevention/mitigation strategy of government agencies is very effective while 11.5%, 61.0% and 19.1% of the respondents claimed the prevention/mitigation strategy of government agencies is effective, less effective and ineffective respectively. The finding revealed that 13.5% of the respondents claimed the preparedness strategy of oil companies is very effective while 9.2%, 19.4% and 57.9% of the respondents claimed the preparedness strategy of oil companies is effective, less effective and ineffective respectively. The effectiveness of response strategy revealed that 7.4% of the respondents claimed the response strategy adopted by government and its agencies is very effective while 13.8%, 26.3% and 52.5% of the respondents claimed the response strategy adopted by government and its agencies is effective, less effective and ineffective respectively. The finding revealed that

13.5% of the respondents claimed the recovery/ rehabilitation strategy adopted by government and its agencies is very effective while 10.2%, 17.6% and 58.7% of the respondents claimed the preparedness strategy of oil companies is effective, less effective and ineffective respectively.

Table 4 revealed that 5.9% of the respondents claimed that by building trust and involvement of host communities is a way of eradicating oil pipeline vandalism, 3.8% claimed punishment of vandals, 9.7% of the respondents claimed by improving the surveillance technology, 7.1% of the respondents claimed through adoption of community-based surveillance scheme while 3.8%. 7.4%, 4.9% and 57.4% of the respondents claimed that eradication of oil pipeline vandalism can be achieve through empowerment and improve socio-economic activities, public education, adequate security engagement and resource control respectively.

Hypothesis testing

The hypothesis was tested using Chi-square statistic. For the interpretation of the analysis, the p-value was used to determine the levels of significant (where $p \leq 0.05$ reject null hypothesis) was adopted (Table 5).

Table 2. Effectiveness of oil companies' disaster management strategies.

Variables	Frequency (n=392)	Percentage (%)
Effectiveness of prevention/mitigation strategy		
Very effective	27	6.9
Effective	78	20.0
Less effective	183	46.6
Ineffective	104	26.5
Effectiveness of preparedness strategy		
Very Effective	30	7.7
Effective	39	10.0
Less Effective	69	17.6
Ineffective	254	64.7
Effectiveness of response strategy		
Very effective	25	6.4
Effective	34	8.7
Less effective	88	22.4
Ineffective	245	62.5
Effectiveness of recovery/rehabilitation strategy		
Very effective	12	3.1
Effective	26	6.6
Less effective	85	21.7
Ineffective	269	68.6

Source: Researcher's field work, 2021.

Table 3. Effectiveness of Government agencies' disaster management strategies.

Variables	Frequency (n=392)	Percentage (%)
Effectiveness of prevention/mitigation strategy		
Very effective	33	8.4
Effective	45	11.5
Less effective	239	61.0
Ineffective	75	19.1
Effectiveness of preparedness strategy		
Very effective	53	13.5
Effective	36	9.2
Less effective	76	19.4
Ineffective	227	57.9
Effectiveness of response strategy		
Very effective	29	7.4
Effective	54	13.8
Less effective	103	26.3
Ineffective	206	52.5
Effectiveness of recovery/rehabilitation strategy		
Very effective	53	13.5
Effective	40	10.2
Less effective	69	17.6
Ineffective	230	58.7

Source: Researcher's field work, 2021.

Table 4. Ways to eradicate oil pipeline vandalism.

Eradication oil pipeline vandalism	Frequency	Percentage (%)
Trust building and involvement of host communities	23	5.9
Punishment of vandals	15	3.8
Improved surveillance technology	38	9.7
Adoption of community-based surveillance scheme	28	7.1
Empowerment and improve socio-economic activities	15	3.8
Public Education	29	7.4
Adequate security engagement	19	4.9
Resource control	225	57.4
Total	392	100

Source: Researcher's field work, 2021.

Table 5. Multivariate tests of significance.

Variables	Chi-Square (X2)	Df	p-value	Decision
Prevent/mitigate activities of oil companies *	52.370 ^a	36	0.038	H1 Accepted
Prevent/Mitigate activities of Government				
Preparedness activities of oil companies *	56.886 ^a	25	0.082	H1 Rejected
Preparedness activities of the Government				
Response strategies of oil companies *	40.744 ^a	30	0.000	H1 Accepted
Response Strategies of Government				
Recovery/rehabilitation activities of oil companies * Recovery activities Government	59.127 ^a	30	0.074	H1 Rejected

Source: Researcher's field work, 2021.

DISCUSSIONS

The stand of the respondents on the effectiveness of the disaster management strategies adopted by the oil companies deduced that the strategies is less effective for prevention/mitigation, ineffective for preparedness, ineffective for response strategy and ineffective for the recovery/rehabilitation disaster management strategy. The finding corroborated with the position of Oteh and Eze (2012) which noted that lack of urgency in assessment of spill impact and payment of compensation or failure to pay compensation are common practice between oil companies and communities. The respondents posited that disaster management strategies adopted by the government and its agencies is less effective for prevention/mitigation, ineffective for preparedness, response and recovery/rehabilitation activities. This finding correlated with that of Adishi and Hunga (2017) which posited that despite the various activities of numerous security outfits including the JFTs in order to curb the activities of oil theft and vandalism, the region still witnesses the menace of vandalism till date which established that the activities of security outfits have not been effective in curbing vandalism. The finding showed similarities with that of Maitland and Chapman (2014) as cited in Herbert and Husaini (2018) which noted that response to oil spills has been marked by corruption, lack

of effective communication, power struggles, and an almost total failure to adequately remedy oil spills by cleaning and restoring the environment and compensating those harmed. The respondents perceived that the way of eradicating oil pipeline vandalism was through resource control followed by improved surveillance technology and public education.

Conclusion and Recommendations

The event of vandalism has negatively impacted the Nigeria oil production as well as economy advantage. At various administrative eras, the more the government develop new strategies to tackle vandalism, the more the vandals devise another means to carry on their activities. Therefore, the study concluded that various disaster management strategies adopted by oil companies and government and its agencies are either less effective or ineffective and required a change in strategy. The study however, recommends that;

1. The government should convoke a national conference of stakeholders in the oil industry, with relevant disaster management outfits to develop effective disaster management strategies for oil pipeline vandalism in line with disaster management cycle best practices.

2. Government and Multi Nationals should adopt disaster management strategies that are community based that integrates the locals in the management of pipeline vandalism to curtail incidences of pipeline vandalism.
3. There is a need for government and multinational collaborations in determining and framing strategies that are effective using international best practices.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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