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ASSESSMENT OF PATTERN OF OIL PIPELINE VANDALSIM IN EGBEMA OIL PRODUCING DISTRICT OF IMO STATE, NIGERIA

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ABSTRACT: The study was carried out to assess the pattern of oil pipeline vandalism in Egbema oil producing district in Imo state of Nigeria. The study made use of the stratified random sampling technique, the simple random sampling was used in selecting the sample for the study. Using the technique, three stratums that make up the oil producing district was identified. From among the stratums, one oil producing community was selected using the simple random sampling statistical method, making a total of three communities. Questionnaire was used as the instrument for data collection. A total of 300 respondents were used for the study, this was achieved by using the Taro Yamane formula for sample size determination, hence 300 copies of questionnaire which is the major source of data collection were administered to the respondents using the proportionate sampling technique. The study identified and classified the pattern of oil pipeline vandalism in Egbema oil district into five components, viz: Nature of pipeline vandalism, Stealling methods, Marketing methods, tools used, and collaborators in oil pipeline vandalism. The study recommends the use of disaster management collaborative approach to oil pipeline security and management to checkmate the patterns of oil pipeline vandalism.

Keywords: Assessment, pattern, oil pipeline, vandalism.

INTRODUCTION

Oil Pipeline vandalism refers to activities that involve the destruction of oil pipelines to disrupt oil supply or the puncturing of oil pipelines to siphon crude or refined petroleum products for personal use or for sale to the black markets, or any other outlets. It includes such acts as illegal oil bunkering, breaking oil pipelines to siphon fuel, scooping oil products from burst pipelines, and deliberate acts of terrorism (Onuoha, 2007). The term has developed to mean rendering the pipelines incapable of transporting petroleum products across the country through the petroleum pipeline networks in the country, and in the process creating unprecedented environmental and social consequences (Nwachukwu, 2003).

Incessant oil pipeline vandalism is one of the major challenges facing Nigeria. 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 pipeline traversed, punctured the pipes and took advantage of ruptured or leaking pipes to siphon fuel or

other petroleum products into drums, plastic containers, or storage materials for sale to the black marketers. The era recorded quite significant cases of pipeline vandalism. For instance between 1993 and 1998, there were 146 cases (Brume, 2007).

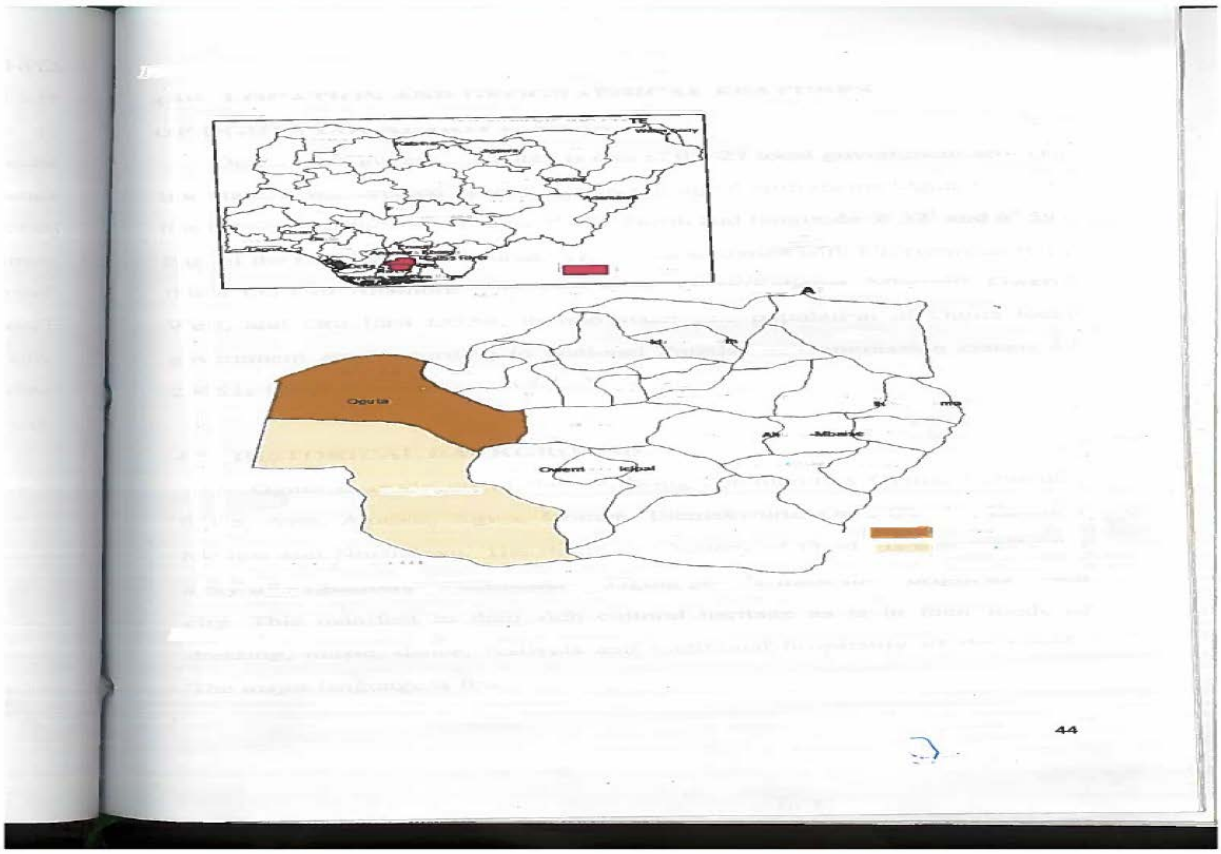
With the return to democratic rule in 1999, the country experienced 34,037 cases of oil pipeline vandalism between 1999 and 2013 (Dawha, 2014). A breakdown showed an astronomical increase to 2, 258; 3,674; 5,518 in 2005, 2006, 2010, etc, respectively (Dawha, 2014).

METHODOLOGY

The study area is the Egbema oil district in Imo state of Nigeria. Egbema oil producing district in Imo state comprises two LGAs (Oguta and Ohaji/Egbema). The oil district was an acronym originated by Shell Petroleum Development Company SPDC) in 1976, to identify oil producing communities in the Oguta and Ohaji/Egbema LGAs in Imo state. The areas lies between latitude 5 degree 31 inches; 5 degrees 47 inches North, and Longitude 6 degrees 37 inches; 6 degrees 59 inches East of the Greenwich meridian, and also latitude 5 degrees 11 inches; 5 degrees 37 inches North, and Longitude 6 degrees 36 inches; 7 degreess 00 inches East of the Greenwich meridian, respectively. The LGAs has a mean monthly minimum temperature between 18 and 23. Relative humidity is between 60 and 80 percent with very high mean monthly cloud coverage (James, 1980). The areas share boundaries with Oru West, Oru East, Mbaitoli, Owerri West and Ngor Okpala LGAs of Imo state, and also Uli, in Ihiala LGA of Anambra state, and Ogba/Egbema/Ndoni; Ikwerre, and Emohua LGAs of Rivers state.

The stratified random sampling technique and simple random sampling technique was used in selecting the sample for the study. Using this technique, the LGAs were divided into three stratums, representing the three districts that formerly make up the Oguta/Ohaji/Egbema LGAs, before the demerging in 1991. One community each were selected from the stratums, making a total of three communities, using the simple random sampling method. Then among the selected communities, four villages were selected from them for enumeration, so also the kindreds, using the above method. The communities selected is as shown in Table 1.

Map showing the study area



Source: Department of Geo-informatics, University of Nigeria, Enugu campus

Table 1: Proportionate distribution of sample size to sampled communities

Communities	2012 projected Population	Sample size allocation/ Questionnaire distributed	Questionnaire Returned
Assa	62,977	137	105
Mmahu	62,102	135	98
Eziorsu	58,399	128	97
Total	183,478	400	300

Source: National Population Commission, 2006, and Researchers' computation

A total of 400 questionnaire, calculated using the Taro Yamane formular was used in determining the sample size for the study. Out of the 400 questionnaires administered using the proportionate sampling technique, only 300 were returned and used for the study. The study adopted the use of both primary and secondary sources of data. The data collected were analyzed using the descriptive statistics.

RESULTS

PATTERN OF OIL PIPELINE VANDALISM IN EGBEMA OIL DISTRICT

Nature of oil pipeline vandalism

Table 2 shows that 37 respondents (12.2%), 68 respondents (22.7%), 27 respondents (9%), and 39 respondents (13%) reveal that pipeline vandalism in Egbema oil district occurs less than 2 times, 2-5 times, 6-8 times, 9-11 times, respectively. While 29.7% of the respondents said that pipeline vandalism occurred not less than 89 times within the study period.

Table 2: The Frequency of daily Pipeline vandalism in Egbema district 2003-2012

	Frequency	Percent	Valid Percent	Cumulative %
Valid Less than 2 times	37	12.2	12.2	12.2
2-5 times	68	22.7	22.7	34.9
6-8 times	27	9.0	9.0	43.9
9-11 times	39	13.0	13.0	56.9
12-14 times	14	4.7	4.7	61.6
15-17 times	2	.7	.7	62.3
18-20 times	2	.7	.7	63.0
21-23 times	22	7.3	7.3	70.3
24 times and above	89	29.7	29.7	100.0
Total	300	100.0	100.0	

Table 3 shows that 15.7%, 8.7%, and 5.3% of the respondents were of the view that the time of pipeline vandalism are between 6am-12 noon, 12noon-6pm, 6pm-12pm respectively, while 70.3% representing 211 respondents said that pipeline vandalism takes place between 12 midnight and 6am. The overall implication is that pipeline vandalism in Egbema oil district occur between 12pm and 6am.

Table 3: Showing frequencies of time of pipeline vandalism in Egbema oil District

	Percent	Frequency	Valid %	Cumulative %
Valid 6am-12 noon	47	15.7	15.7	15.7
12 noon-6pm	26	8.7	8.7	24.4
6pm- 12 pm	16	5.3	5.3	29.7
12 am- 6am	211	70.3	70.3	100.0
Total	300	100	100.0	

Table 4 shows that 24.3%, 36.7%, and 39% of respondents were of the view that the community people were unable to obstruct vandals because vandals are security agents, are armed with sophisticated weapons, and it is not their business, respectively. This implied that the community people show lackadaisical attitude to oil pipeline vandals, for it is not their business.

Table 4: Table showing why community people don't obstruct oil pipeline vandals in Egbema oil district.

	Frequency	Percent	Valid percent	Cumulative %
Valid: Vandals are security agents	73	24.3	24.3	24.3
Vandals are armed to the teeth	110	36.7	36.7	61.0
Not our business	39	39.0	39.0	100.0
TOTAL	300	100.0	100.0	

Table 5: shows that 175 respondents (58.3%), and 75 respondents (25%) were of the view that vandals use oil pipelines and flowlines most, in siphoning petroleum products in Egbema district. The table also show that 8.3%, 4.7%, and 3.7% of the respondents were of the view that vandals also make use of the well-heads, manifolds and export terminals in siphoning petroleum products.

Table 5: Showing respondents responses on facility used by vandals in siphoning petroleum products in Egbema district.

	Frequency	Percent	Valid percent	Cumulative %
Valid Pipelines	175	58.3	58.3	58.3
Well-Heads	25	8.3	8.3	66.6
Flow lines	75	25.0	25.0	91.6
Manifolds	14	4.7	4.7	96.3
Export terminals	11	3.7	3.7	100.0
Total	300	100.0	100.0	

Table 6 shows that 1%, 29.7%, 16.7%, 6.7%, and 46% of respondents were of the view that knives, chemicals, dynamites, hacksaws, and drilling machines are tools used by vandals in cutting oil pipelines, respectively. The overall implication is that drilling machines and use of chemicals are the most rampant method used in cutting pipelines in the study area.

Table 6: Table showing responses on tools used by vandals in cutting oil pipelines in Egbema oil producing district.

	Frequency	Percent (%)	Valid %	Cumulative %
Valid Knives	3	1.0	1.0	1.0
Chemicals	89	29.7	29.7	30.7
Dynamites	50	16.6	16.6	47.3
Hacksaws	20	6.7	6.7	54.0
Drilling-machines	138	46.0	46.0	100.0
Total		100.0	100.0	

Table 7 shows that 56%, 1%, 15.7%, 20%, 3.3% and 4% of the respondents were of the view that tankers, motor cycles, outside markets, petrol stations, gericans/drums, and buses, respectively are used in marketing stolen petroleum products out of Egbema oil district. The responses revealed that the most used means are tankers, representing 56%.

Table 7: Table showing statistics of method of marketing stolen petroleum products in Egbema oil district

	Frequency	Percent	Valid percent	Cumulative %
Valid Tankers	168	56.0	56.0	56.0
Motor cyclists	47	15.7	15.7	71.7
Outside markets	3	1.0	1.0	72.7
Petrol stations	60	20.0	20.0	92.7
Gericans/drums	10	3.3	3.3	96.0
Buses	12	4.0	4.0	100.0
Total	300	100.0	100.0	

Table 8 shows that 33.7%, 3.7%, 10.3%, and 2% of the respondents were of the view that security agencies, Oil company workers, Politicians, and community people collaborate with vandals in oil pipeline vandalism in the study areas. 50% of respondents were of the view that they do not know who collaborate with vandals in oil pipeline vandalism in the study areas. The implication of this discovery is that security agencies are the most culprit, in collaborating with vandals in pipeline vandalism in the study areas.

Table 8: Table showing collaborators with vandals on pipeline vandalism in Egbema oil district

	Frequency	Percent	Valid (%)	Cumulative %
Valid Security agencies	101	33.7	33.7	33.7
Oil company staffers	11	3.7	3.7	37.4
Politicians	31	10.3	10.3	47.7
Community people	6	2.0	2.0	49.7
I do not know	151	50.3	50.3	100.0
Total	300	100.0	100.0	

DISCUSSIONS

The aim of this study is to assess the pattern of oil pipeline vandalism in Egbema oil producing district. Sequel to this, this research focused on identifying the nature of oil pipeline vandalism, methods of stealing petroleum products, methods of marketing stolen petroleum products, collaborators with vandals in pipeline vandalism, and tools used in pipeline vandalism. The implication of this result with respect to each of the five component patterns are as follows:

a. Nature of pipeline vandalism

Tables 2,3 and 4 show indices of the nature of oil pipeline vandalism in Egbema district. It showed that pipeline vandalism occurred more than 88 times within the study period. The activity takes place at night times, and that the community people showed no interest in obstructing the vandals. The result implied that oil pipeline vandalism will decrease with a decline in the nature of pipeline vandalism. This was an indication that the nature of pipeline vandalism is a major pattern of pipeline vandalism adopted by vandals in Egbema oil district.

b. Methods of stealing petroleum products.

This consist of five variables. These are as follows: Vandals steal petroleum products from oil pipelines, vandals steal petroleum products at export terminals, vandals steal petroleum products from well-heads, vandals steal petroleum products from flowlines, vandals steal petroleum products from manifolds. Stealing of petroleum products form oil pipelines has the highest significant impact. On the other hand, stealing of petroleum products from the export terminals has the least impact. This result implied that the pattern of oil pipeline vandalism in Egbema district will decrease with decline in the methods of stealing of petroleum products from oil pipelines. This was an indication that stealing method adopted by vandals is a major pattern of oil pipeline vandalism in Egbema oil district.

c. method of marketing of stolen petroleum products.

This consists of six variables, which include that, stolen petroleum products are sold outside the communities, sold at petrol stations, and that drums/gericans are used in storing petroleum products. Others are that tankers, motor cycles and buses are used in transporting petroleum products. Marketing of petroleum products by the use of tankers in communities in Egbema oil district has the highest significant impact, whereas selling of stolen petroleum products outside the community of origin markets had the least significant impacts.

The implication of this result is that pipeline vandalism will decrease with reduction in the pattern of marketing of stolen petroleum products in the district. This is an indication that the marketing of stolen petroleum products is a major pattern adopted by vandals in the Egbema district.

d. Collaborators with vandals in oil pipeline.

This consists of five variables, which are that vandals collaborate with government security agencies in oil pipeline vandalism, vandals collaborate with oil company staffers in pipeline vandalism, vandals collaborate with politicians in pipeline vandalism, and vandals collaborate with community people in stealing petroleum products. Vandals' collaboration with security agencies of government in oil pipeline vandalism has the highest significant impact. On the other hand, vandals' collaboration with community

people in stealing petroleum products has the least impact.

This result implied that the pattern of oil pipeline vandalism in Egbema district will decrease with reduction in the level of collaboration between vandals and government security agencies. This was an indication that collaboration strategy adopted by vandals is a major pattern of oil pipeline vandalism in Egbema district.

e. Tools used by vandals in oil pipeline vandalism

This consists of five variables. They include; Use of drilling machines, the use of chemicals in pipeline vandalism; use of hacksaws in pipeline vandalism; use of dynamites in pipeline vandalism; and use of knives in pipeline vandalism. The use of drilling machines in oil pipeline vandalism has the highest significant impact, whereas the use of knives in pipeline vandalism had the least impact.

The implication of this result is that pipeline vandalism will decrease with decline in the use of drilling machines in pipeline vandalism in Egbema district. This is an indication that tools used in pipeline vandalism is a major pattern adopted by oil pipeline vandals in Egbema district.

Conclusion/Recommendations

Overall, five patterns of oil pipeline vandalism were identified in the study. They are: Nature of pipeline vandalism, methods adopted by vandals in stealing petroleum products, methods adopted by vandals in marketing stolen petroleum products, collaborators with vandals, and tools used by vandals in pipeline vandalism in Egbema oil district. The study revealed that security agencies of government collaborate with vandals in petroleum products theft, and marketing. They aid vandalism and escort the vandalized products to selling points in the Egbema oil district. This scenario questions the possibility of abating the upsurge of oil pipeline vandalism, hence the assertion “Upsurge of oil theft and illegal bunkering in the Niger Delta: Is there a way out” (Odalonu, 2015). The following disaster management style should be adopted to stem the tide in pipeline vandalism in the area.

1. **Stakeholders’ collaboration in the security of oil pipelines.** Disaster management as the slogan goes, is not a one man, or one agency business. It is a collaborative effort, because no one agency can do it alone. Therefore, stakeholders in disaster management collaborative approach in pipeline surveillance is the pre-requisite for the safety and security of oil pipelines (Ekwo, 2011). This will reduce collaboration with vandals, since security will no longer be left under the watch of one or two agencies alone.

2. **Community involvement in pipeline security**

   Study revealed the “I don’t care attitude of community people” in the menace of oil pipeline vandalism. This is as a result of their non inclusion in the business of oil management in the area. Communities should therefore be part and parcel of the management of the resource that is domiciled in their land (Jike, 2010). They should be involved in the security, employment opportunities, contract opportunities, decision

making in all ramifications, and other benefits accruing from the oil business.

3. **Installation of security devices**

Security devices should be installed in the industry (Agbakuru, 2011; Parker, 2004). It was identified that crude oil theft occur at night times, takes place at well-heads, manifolds, flow-stations, pipelines, flowlines, escorted by security agencies, and sold at petrol stations. Therefore, security devices that are capable of monitoring every human activity in the industry should be installed. Use of above strategy will result to proactive response, recovery, mitigation, and reconstruction by response agencies.

Conflict of Interest

The author(s) declare that they have no conflict of interest.

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