OPEN ACCESS

Saudi Journal of Medicine
Abbreviated Key Title: Saudi J Med
ISSN 2518-3389 (Print) | ISSN 2518-3397 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com

Original Research Article

Understanding Fishermen Attitude and Factors Influencing Oil Spillage in Biseni Community of Bayelsa State, Nigeria

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DOI: https://doi.org/10.36348/sjm.2025.v10i05.003 | **Received:** 14.03.2025 | **Accepted:** 21.04.2025 | **Published:** 14.05.2025

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Abstract

Background: Oil spillage is a global issue that has been occurring since the discovery of crude oil, which was part of the industrial revolution. The volume of oil spillage in the ocean, sea, river through human activities is estimated to range from 0.7 – 1.7 million tons per year in Niger Delta region. This study assessed the attitude towards oil spillage among fishermen in Biseni community of Bayelsa State. ***Methodology:*** This was a descriptive cross-sectional study was carried out in Biseni community of Yenagoa LGA. Three hundred and fifty-eight respondents were selected from the community using systemic random sampling technique. A semi- structured interviewer administered questionnaire was used for data collection. Data entry was carried out using SPSS version 16. ***Results:*** Three hundred and thirty-eight (94.4%) of the respondents identified corrosion due to soil factors as a major cause of oil spillage, 84.1% attributed oil spillage to unemployment, 86.3% sabotage by surveillances contractors and 85.2% by pipeline vandalism as factors responsible for oil spillage. Majority of the respondents (98.0%) identified water pollution as the major effect of oil spillage on aquatic life. Three hundred and forty-seven (96.9%) of the respondents identified health problem and mainly skin rash (32.0%) as the major effect of oil spillage on fishermen while other effect include reduction in income (95.5%). Perceived justification of respondents for oil spillage include unemployment (91.9%), increasing the rate of kidnapping (79.6%), lack of compensation (80.4%), relocation (35.8%), driving people away from their original settlement (91.9%) and buying of water for drinking and domestic uses (70.4%). ***Conclusion:*** Biseni community has experienced serious degradation due to oil exploitation and exploration activities that has resulted in oil spillage. Oil spillage has caused displacement of people, involuntary migration, destruction of wildlife and biodiversity, loss of fertile soil, Pollution of drinking water, degradation of farmland and damage to aquatic lives, all of which have caused serious health problems to the fishermen. It was also confirmed from the respondents that they were not compensated for the damage of their farms and water for fishing.

Keywords: Understanding, Attitude, Fishermen, Bayelsa.

INTRODUCTION

Oil spillage is a global issue that has been occurring since the discovery of crude oil, which was part of the industrial revolution [1]. The total spillage of petroleum in the oceans, seas and rivers through human activities is estimated to range between 0.7 and 1.7 million tons per year in the Niger- Delta [1]. Oil spills have posed a major threat to the environment of the oil producing areas which, if not effectively checked, can lead to the total destruction of ecosystems. The Niger-Delta is among the ten most important wetland and marine ecosystems in the world [1, 2]. The oil industries located within this region have contributed immensely to the growth and development of the country which is a fact that cannot be disputed but unsustainable oil

exploration activities has rendered the Niger-Delta region one of the five most severely petroleum damaged ecosystems in the world [3, 4].

The results of the oil activities of Shell have seen the Niger-Delta indigenes being refugees, some incarcerated, while a host of others including over 200 Ogoni and 400 Ijaw people killed in 1999 owing to police and military brutality during protest [5].

Hostage-takings, violence and pipeline vandalism are the common terms now synonymous with the Niger-Delta. The environmental degradation because of crude oil exploitation/exploration which culminated into oil spillage has troubled the lands and waters while poverty has traumatized the people [6].

Political dislocation in the oil-bearing areas has been primarily the result of oil industry activities. It has been argued that oil companies operating in the Niger-Delta have played a very significant role in the collapse of values and systems in the Niger-Delta through an adverse reshaping of the local political landscape and the introduction of corrupt and divisive community relation policies reminiscent of the divide and rule tactics of colonial Nigeria [7].

Oil-related activities have brought with them the politics of oil and that this has ignited and exacerbated oil related conflicts in the oil-bearing areas. These conflicts are multi-dimensional. The communal conflicts can take the form of conflict within a community, conflict between communities, and conflict between host communities and the oil companies. The intra- and inter-communal conflict is usually oil-induced [8]. The presence of oil has exacerbated political disputes over territory or other rights. While territorial disputes in the area predate the discovery of oil. For instance, the Ugbo and Mahin-Ilaje conflicts during the British rule led to the deportation of the traditional ruler of Ugbo-Ilaje by the British imperial ruler [9]. However, since the discovery and commercial exploitation of oil, many of the conflicts between communities in the area are fuelled by the presence of oil. A case in point is bloody conflict of 1998 between the Arogbo-Ijaw and the Ugbo-Ilaje, which was attributed to the presence of oil in a boundary town between the two ethnic groups [5, 9]. Even though the oil industry is blamed for a range of ills and for not doing enough for the areas where they operate, communities are also aware of the potential benefits of having oil pipelines travel through their land or the presence of a flow station and the opportunities for compensation payments and contracts that will result, even if the compensation only reaches a few. Therefore, disputes between communities, which may have been latent can be stirred up by the suggestion that an oil installation is planned as well as damage caused by oil pollution [6, 7].

Kidnapping of foreign workers of oil companies and the request for a ransom before their release was the order of the day for these militant groups. Vandalism of oil pipelines owned by the government and multinational oil companies was not left out. Oil theft was another major activity carried out by these militant groups. All these led to not only oil spillage but “blood spillage”. In 2010, the federal government granted Amnesty to these militant groups and till date pays “salary” to the youths that surrendered their arms and ammunition. Despite the amnesty granted, there are recent cases of kidnapping, vandalism and oil “Bunkering” in the Niger-Delta area of Nigeria. Pipeline vandalism is common in Nigeria despite the risk of deadly fire or punishment including prosecution or being shot on site by security forces and ultimately blood spillage. Worthy of note is the fact that it is not only in the Niger-Delta region that oil spillage occurs in Nigeria.

Oil theft, sabotage and pipeline vandalism is carried out by criminals in difference states like Ogun, Oyo, Enugu and Lagos states to mention a few. More so, oil spillage occurs from oil tankers across the states in Nigeria. Due to the breakdown of operations of Refineries in the country, oil tankers transport petrol and kerosene from the southern parts to the Northern parts of Nigeria. Thousands of lives have been lost when oil tankers spill the product they carry and properties worth billions of naira lost [6, 10].

In 1956, Shell British Petroleum (now Royal Dutch Shell) discovered crude oil at a village called Oloibiri in Ogbia Local Government Area of Bayelsa State located within the Niger-Delta of Nigeria and commercial production began in 1958 [2]. As at 2006, there were eleven oil companies operating in the region, 159 oil fields and 1,481 oil wells were in operation in the Niger Delta [4, 5]. Human activities and those of oil exploration and exploitation raise a number of issues such as depletion of biodiversity, coastal and riverbank erosion, flooding, oil spillage, gas flaring, noise pollution, sewage and waste water pollution, land degradation and soil fertility loss and deforestation, which are all major environmental issues. Oil exploration and exploitation have been ongoing for several decades in the Niger-Delta. It has had disastrous impacts on the environment in the region and has adversely affected people inhabiting the region [6]. The growth and development of the oil and petrochemical industry in Nigeria with emphasis on the notable cases of pollution disturbances during the 50 years of its existence, highlighting causes and effects on the social, economic, agricultural and ecological characteristic on human and other biotic occupants of the oil region [7]. The effects of the operations of the oil companies on the environment are not only devastating but have triggered off series of crisis. Most of the conflicts have arisen from complex environmental problems and a long history of basic neglect and social development of peoples who have seemed helpless watching their land and water

resources continually devastated by intensive exploitation for petroleum and gases without deriving any appreciable benefits by way of investment in their own development [6]. Since the discovery of oil in Nigeria in the 1950s, the region has been suffering the negative environmental consequences of oil development [11].

The effects of intensive oil resource extraction on the environment of the oil bearing Niger-Delta communities are environmental problems such as resource degradation, pollution and poverty in the Niger Delta communities. The oil spillage incidences in Nigeria with its negative implication on the environment, suggest the extent of hazards and the tendency of petroleum products to pollute the environment. The implications of oil exploration and environmental degradation to sustainable development of the Niger-Delta region, explaining this has culminated into poverty, restiveness and human insecurity in the region [12].

In general, the assessment of other researchers into this issue acknowledges that the oil industry has undoubtedly brought economic benefit to the Nigerian State but has left environmental pollution problems with visible physical destruction. The prevention of environmental degradation is a task that must be pursued vigorously [13].

The identification of problems, design and applying appropriate sanctions are major issue that need to be resolved and has to start with change in the present judicial system and attitude towards the litigation of environmental issues as well as a reform in environmental policies [14, 16].

The aim of the study was to assess the attitude of fishermen towards oil spillage in Biseni Community and hence, to identify the effects of oil spillage

METHODOLOGY

Study Area: The Biseni community consists of about ten/settlements villages and is located in the Yenagoa Local Government Area of Bayelsa State, Nigeria. Biseni community is in the South latitude: 5°14′31.8″N 6°32′30.7″E, Biseni community has an area of about 8.2Km^2. Biseni community has one functional Cottage hospital, one Comprehensive Health Centre and three Primary health care centres. The Biseni Community has four primary schools and one Secondary Institution. Biseni community also has 29 oil wells, 2 clusters and 2 manifolds.

Bayelsa State is one of the thirty –six (36) states in Nigeria created on the 1st of October, 1996 with a population of 2 million people according to 2006 population census figure. Bayelsa State has an area of 21,000 square km, and about three-quarters of its total land mass are riverine. The mangrove forests and swamps in the southern part of the state are home to rich vegetation, while the thick forest in the northern part has arable lands used for agriculture. Bayelsa is situated in the heart of the Niger-Delta and produces about 30-40% of Nigeria's oil and gas.

Yenagoa is a Local Government Area in Bayelsa State, Nigeria. Its headquarters is Yenagoa (the State capital) in the south of the State at 4°55′29″N 6°15′51″E4.92472°N 6.26417°E. The LGA has an area of 706 km² and a population of 353,344 at the 2006 census.

English is the official language of the inhabitants, but Epie/Atissa dialect of the Izon language is the major language spoken in Yenagoa. Since attaining the status of state capital in 1996, construction and other activities have accelerated appreciably.

The Niger-Delta region derives its name from being situated at the mouth of the River Niger. Before the creation of the Nigerian states, economic activities of the Niger Delta in pre-colonial days entailed mainly export of salt and fish to the hinterland. In the 18th century, when the slave trade was at its peak, the region was West Africa's largest slave exporting area, and this was enhanced by its proximity to the sea. Slave traders, however, diverted to palm oil trade in the 19th century when the slave trade declined.

The Niger-Delta region is situated in the southern part of Nigeria and bordered to the south by the Atlantic Ocean and to the East by Cameroon, occupies a surface area of about 112,110 square kilometres. The Nine States of the Niger Delta Region are Abia, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo and Rivers.

The main ethic groups of the Niger-Delta region are the Ijaws (the largest ethnic group), the Itsekiris, Yorubas, Efiks, Ibibios and other smaller groups. Within Akwa Ibom State it is the Ibibios who make up the majority of population. The major traditional occupations include farming and fishing, while secondary occupations include industries like gin distillation, textile weaving, and boat carving. Tertiary occupations include trade and commerce, and transportation. Oil was first discovered in a village called Oloibiri in Ogbia Local Government Area of Bayelsa State of the Niger-Delta region in Nigeria. Since the inception of crude oil exploitations and explorations activity in the region, there has been series of oil spillages.

Study Design: The study was a cross-sectional descriptive study involving the use of questionnaire to obtain quantitative data from the respondents.

Study Population: The study population was adults 18 years and above who were registered members of the

fishermen Association in Biseni Community, Yenagoa Local Government Area of Bayelsa State

Inclusion criteria: All the fishermen and women that were registered members of the fishermen Association in Biseni Community.

Exclusion criteria: Fishermen and women that were registered members of the association but had not spent up six months in Biseni Fishermen Association.

Sample Size Determination: Fischer's formula [4, 7] for sample size determination was used to calculate the minimum sample size from the population of registered fishermen in Biseni Community. Population of the fishermen residing in Biseni community was estimated to be 2000. The formula for studying proportions with population less than 10,000 to calculate the sampling size was used as described below.

$n = \frac{Z^2pq}{d^2}$

$n_f = \frac{n}{1+\frac{n}{N}}$

Where;

n = the desired Sample Size when population is >10,000

z = Standard normal deviation =1.96

p= the proportion of the community estimated to have effects of oil spillage; estimated to be 50% (since there is no past study on the topic).

q = the proportion of the community without effects of oil spillage =1.0-p

d= precision or degree of accuracy, usually set at 0.05

n_f = desired sample size when population is <10,000

N=estimated population size

$n = \frac{Z^2pq}{d^2}$

$= \frac{(1.96)^2(0.5)(0.5)}{0.05^2}$

n =384

Since estimated target population is <10,000

Therefore;

$n_f = \frac{n}{1+\frac{n}{N}}$

$n_f = \frac{384}{1\frac{384}{2000}}$

n_f=322

To compensate for non-response, 10% of the original sample size was added.

$= \frac{322}{0.9}$

=358

A total of 358 fishermen and women participated in the study.

Sampling Technique: Systematic random sampling technique was adopted to choose the eligible respondents. There were 2000 registered fishermen in Biseni Fishermen Association (sampling frame). Sampling interval (k) was determined by K=N/n= 2000/358= 6, where N was the sampling frame and n the sample size. The index subject was selected by simple random sampling method by balloting among the first six members of the association listed on the register. Subsequent subjects were recruited for the study from the sampling frame at regular intervals of six. Where selected respondent was not available, the next person on the list was picked.

Data Collection Tools: Four trained research assistants used interviewer administered semi-structured questionnaire to collect data; the questionnaire contained questions used to obtain information on the attitude and factors influencing oil spillage among the study subjects.

Statistical Analysis: Data analysis was done using SPSS version 16 software package. Data were presented as frequency tables, charts and cross tabulation of important variables. Perception score and attitude score as outcome variables were cross-tabulated against the socio-demographic variables as independent variables observed among the respondents. Appropriate test of significance was also carried out using Chi-square test. Statistical significance was set at ($p<0.05$)

Ethical Considerations: Confidentiality were ensured as the participants were not asked to write their names nor any means of identification

RESULTS

Table 1: Socio-Demographic Characteristics of Respondents (N=358)

Variables	Frequency	Percentage
Age groups		
≤ 20	12	3.4
21 – 30	168	46.9
31 – 40	68	19.0
41 – 50	63	17.6
51 – 60	34	9.5
> 60	13	3.6
Gender		
Male	189	52.8
Female	169	47.2

Variables	Frequency	Percentage
Marital status		
Single	150	41.9
Married	182	50.8
Divorced	15	4.2
Widowed	11	3.1

Table 2: Socio-Demographic Characteristics of Respondents (N=358)

Variables	Frequency	Percentage
Educational Status		
No formal education	105	29.3
Primary	115	32.1
Secondary	95	26.5
Tertiary	43	12.0
Religion		
Christianity	340	95.0
Traditional	18	5.0
Settlement		
Egbebiri	192	53.6
Tein	64	17.9
Akpide	71	19.8
Tuburu	29	8.1
Ethnicity		
Ijaw	353	98.6
Urhobo	2	0.6
Ilaje	2	0.6
Isoko	1	0.3

One hundred and sixty-eight (46.9%) respondents were in age group 21 -30years with more male (52.8%) than female. About half of the respondents were married (50.8%), 32.1% had primary school education with almost all (95.0%) of the respondents being Christians. However, 53.6% were of Egbebiri settlement and almost all (98.6%) the respondents were Ijaws.

Table 3: Respondents Purpose of Fishing and other Means of Livelihood

Purpose of fishing	Frequency	Percentage
Commercial	191	53.4
Household consumption	167	46.6
Other means of livelihood		
Trading	177	49.4
Civil servant	32	8.9
Driver	100	27.9
Others	49	13.7

More than half (53.4%) of the respondents does fishing mainly for commercial purpose and other means of livelihood was majorly (49.4%) trading.

Table 4: Attitudes of Respondents Towards Oil Spillage

Response	Yes (%)	No (%)	No Idea (%)
People relocated	175 (48.9)	128 (35.8)	55 (15.4)
Resulted in loss of Job	329 (91.9)	16 (4.5)	13 (3.6)
Increased kidnapping activities	285 (79.6)	37 (10.3)	36 (10.1)
Communal clash	305 (85.2)	20 (5.6)	33 (9.2)
Increase in price of food	231 (64.5)	87 (24.3)	40 (11.2)
Communities are compensated	22(6.1)	288 (80.4)	48 (13.4)
Community is satisfied with government role	25 (7.0)	291 (81.3)	42 (11.7)
Fishermen are hostile towards companies	334 (93.3)	17 (4.7)	7 (2.0)
Fishermen are angry with government	352 (98.3)	0 (0.0)	6 (1.7)
It drives people away from settlement	281(78.5)	67 (18.7)	10 (2.8)

Three hundred and fifty-two of the respondents (98.3%) said they were angry with government because of oil spillage, 93.3% were hostile towards the oil companies, 91.9% increased unemployment, 85.2% communal clashes, 71.3% increases price of food, 79.6% increased kidnapping activities, 78.5% agreed that oil spillage drives people away from their settlement while 48.9 % of the respondents believed it resulted into relocation.

Table 5: Attitude Score for Effects of Oil Spillage

Attitude Score	Frequency	Percent
Positive	45	12.6
Negative	313	87.4

Three hundred and thirteen (87.4%) of the respondents had a negative attitude score for effects of oil spillage in Biseni community.

Table 6: Income Of Respondents and Attitude Scores of Respondents on Oil Spillage

Income group(#)	Attitude score		Total (%)	X^2	P-Value
	Positive (%)	Negative (%)			
≤ 5000	1 (0.3)	2 (0.6)	3 (0.8)		
5000-24000	2 (0.6)	90 (25.1)	92 (25.7)		
25000-44000	6 (1.7)	193 (53.9)	199 (55.6)		
45000-64000	13 (3.6)	14 (3.9)	27 (7.8)		
65000-84000	14 (3.9)	6 (1.7)	20 (5.6)		
85000-104000	9 (2.5)	7 (1.9)	16 (4.5)		
≥ 105000	0 (0.0)	1(0.3)	1(0.3)		
Total	**45 (12.6)**	**313 (87.4)**	**358 (100)**	**112.623**	**0.000**

Majority, 193 (53.9%) of the respondents who had negative attitude to effect of oil spillage earned an income range of 25000-44000 naira. The attitude score on effects of oil spillage was positive (12.6%) among the respondents and this increased with their income levels up to 65000-84000 income class. This relationship was statistically significant ($p< 0.05$).

Table 7 Purpose of Fishing and Attitude Score of Oil Spillage by Respondents

Purpose of fishing	Attitude score		Total (%)	X^2	P
	Positive (%)	Negative (%)			
Commercial	41 (11.5)	150 (41.9)	191 (53.4)		
Household consumption	4 (1.1)	163 (45.5)	167 (46.6)		
Total	**45 (12.6)**	**313 (87.4)**	**358 (100)**	**29.486**	**0.000**

More of the respondents 313(87.4%) had a negative attitude score for oil spillage and this was found to be higher for household 163(45.2%) than commercial 150 (41.9%) consumption of fish. The relationship was statistically significant ($p<0.05$).

DISCUSSION

The mean age of respondents in this study was 35.5±12.4SD while the age ranged from 18 to 78 years. One hundred and sixty-eight of the respondents (46.9%) were majorly of age group 21-30 years. There were more male (52.8%) than female. About half of the respondents were married (50.8%) with 41.9% single. These indicate that fishing trade is predominantly for men and young adults. It is also a business of all categories of adults including youths and the elderly. The main sources of income for people of Biseni are peasant farming, fishing and small scale logging of the timber in surrounding forest [3]. One hundred and five (29.3%) of the respondents had no formal education, 115 (32.1%) and 95 (26.5%) had primary and secondary education respectively and only 43(12.0 %) of the respondents had tertiary education. This could be due to the fact that fishing in rivers does not require special skills and fishing is related to the socio-cultural life of Biseni community. Christianity was the religion of majority of the respondents (95.0%) because it was Christians dominated community.

The cosmopolitan composition of Bayelsa, is supported by the findings of mixed ethnic group within the study area, though the inhabitant were predominantly Ijaw (98.6%) which is a reflection of its setting and about half of the respondents were Egbebiri by settlement.

The purpose of fishing by respondents was more of commercial (53.4%) than household consumption (46.6%). This is supported by a study done in Rivers [2, 6]. The rich alluvial soil of the Delta coupled with copious web of fresh and salt- water bodies provide the necessary incentives for the people who are predominantly fishers and farmers [2, 6]. Fishing forms

the most dominant economic activity in the area [1, 2]. Research showed that fishing accounts for at least 80% of the active labour force. Other means of livelihood by respondents were majorly trading (49.4%), 27.9% were also drivers and very few of the respondents were civil servant (8.9%).

The high percentage obtained in this study could be due to the fact that the people involved were being interviewed directly and partly due to increased awareness of people on the effects of oil spillage as compared to a research done ten years ago.

Attitude of respondents to oil spillage as identified in this study include angry of people with Government (98.3%), increased kidnapping (79.6%), communal clash (85.2%) and relocation (78.5%). Oil spillage resulted in internal displacement of communities in the Niger Delta [11], and this tends to diminish the productivity of farming and fishing in the community. This also cause members as group to relocate and also result in occupational and income losses that lead to both voluntary and involuntary migration [11]. Consequently, loss of ancestral homes, familiar surroundings and religious and other cultural artifacts are the psychological and social problems associated with displacement [4]. Also, the collapse of local economies, induced by oil spillage and other activities of the oil industry had displaced many from their occupations, without providing viable alternatives, the pressure for survival do encourage forced migration or induce voluntary movement that manifest as rural-urban or rural-rural migration in the area [11].

Most of the respondents in this study (80.4%) claimed they were not compensated for their loss, even though communities were aware of the potential benefits of having oil pipes travel though their land or the presence of a flow station and the opportunities for compensation payment and contracts that will result, even if the compensation only reaches a few [6,7]. This is in agreement with a study conducted in Ogun State [9] where 75.7% also claimed not being compensated and most of the oil producing communities already have their environments degraded, lost their farm land and rivers for fishing to oil spillage [9]. Majority of the respondents in this study bought water (70.4%) for drinking and domestic uses. This is not surprising as drinking water has been contaminated by oil spillage causing serious health problem to the inhabitants of the people in the oil bearing communities [11]. Residents of oil producing areas sometimes have to cope with drinking water that contains residual oil even many years after clean-up [4]. All across the Delta, the water and soil have been poisoned with hydrocarbon, heavy metals and other substance [7,8].

The proportions (87.0%) of the respondents with negative attitude to the effects of oil spillage were consistently higher than those (13%) that had positive attitude and the relationships of the attitude to their health problems were found to be statistically significant ($p< 0.05$).

CONCLUSIONS

Biseni community has experienced serious degradation due to oil exploitation and exploration activities that has resulted in oil spillage. Oil spillage has caused displacement of people, involuntary migration, destruction of wildlife and biodiversity, loss of fertile soil, Pollution of drinking water, degradation of farmland and damage to aquatic lives, all of which have caused serious health problems to the fisher men in Biseni Community.

Oil spillage occurred several times in this community as a result of upsurge in oil exploration and exploitation. The major cause as identified by the respondents was corrosion due to soil factors which has lead to majority of respondents buying water for domestic uses and drinking, death of some fishermen, destruction of ecology, reduction in income and unemployment. It was also identified by majority of the respondents that they were not compensated for the damage of their farms and water for fishing.

RECOMMENDATIONS

1. The petroleum industry should work closely with government agencies, universities and research centers and come out with management strategies for combating the menace of oil spillage incidents.
2. When a spill occurs, various governmental and non-governmental agencies should harness all available resources to reduce the impact of the oil spillage on our coastal environment.
3. There is a need for a better understanding of the coastal ecology so as to evaluate the significance of the impacts generated by oil spill incidents.

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