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Environmental Identities and Attitude towards Crude Oil Pipeline Vandalism in Niger Delta Oil-Producing Communities

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Abstract: Environmental identities and attitude towards oil pipeline vandalism in Niger Delta oil-producing communities were examined to show whether low environmental identity is associated with an environmentally destructive attitude, as well as how such issues may be connected with incidents of oil pipeline vandalism in the area. A survey of youths (N = 603) from selected oil-producing communities in the Niger Delta area was conducted. A subset of the sample participated in focus group discussions, and ten experts were interviewed. Socioeconomic and demographic factors of participants were also investigated, as they might be associated with environmental identities and attitudes. The study found that the youths who scored medium to high on the environmental identity scale are more likely to be pro-environmental. There was also a significant association between gender and environmental identity scores. Occupation, education, and income levels were also associated with attitude towards oil pipeline vandalism. However, there was no significant association between environmental identity and attitude towards oil pipeline vandalism. The strong associations between socioeconomic factors, environmental identity, and attitude towards pipeline vandalism suggest that improved socioeconomic status may help to curb oil pipeline vandalism in the Niger Delta.

Keywords: environmental identity; oil pollution; sustainability; environmental hazards; oil pipeline vandalism; socioeconomic status

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1. Introduction

The recurring incidents of crude oil pipeline vandalism and consequent crude oil pollution in the oil-rich Niger Delta region of Nigeria pose significant threats to human security and landscape sustainability [1,2]. Over the years, oil-producing communities in the region have protested against environmental and social injustices, drawing attention to the environmental degradation emanating from the oil and gas industry in the area [1,3–5]. Several stakeholders, including the United Nations, have expressed concerns about crude oil pollution in the Niger Delta. For example, a report on the environmental assessment of Ogoniland shows the deplorable consequences of oil pollution [2]. According to Babatunde [6], environmental dislocations by multi-national oil companies have fueled conflict and violent attacks on oil facilities by aggrieved local people, leading to a vicious cycle of environmental insecurity, the erosion of livelihoods, and poverty in the Niger Delta region. Furthermore, criminal groups take advantage of the situation to vandalize oil pipelines and to steal crude oil from the pipelines. As a result, several youth militia

groups have emerged claiming to protect the affected communities (e.g., the Movement for the Emancipation of the Niger Delta—MEND, the Niger Delta People's Volunteer Force—NDPVF, Niger Delta Avengers—NDA, etc.) [7–9].

The Niger Delta has become notorious for militancy and environmental devastation [8,10,11]. This development has raised issues about youth identity profiles [10,12–14] and their environmental attitudes [5,15].

Previous research has pointed to a lack of connection with nature as one of the reasons for apathy towards environmental protection [16]. Some studies conducted in the Niger Delta area agree that oil and gas production activities have a noticeable impact on the environmental perception of the people [13,17] and their psychological wellbeing [18]. The scenarios that surround our daily lives have a major influence on the way we perceive, feel, and behave [19]. Thus, the living conditions in oil-producing states may influence some of the local people's attitudes to the environment. Policymakers involved in the development of the Niger Delta should pay attention to such issues and trends that interact with environmental sustainability and oil production in the Niger Delta. Our research has implications for some of the 17 Sustainable Development Goals of the United Nations, including poverty, reduced inequalities, decent work and economic growth, clean energy and clean water, and sustainable cities and communities. This paper aims to examine whether the environmental identities of youths in this region may be associated with their propensity towards oil pipeline vandalism.

1.1. Oil Pipeline Vandalism and Oil Pollution in the Niger Delta Oil-Producing Communities

Oil pipeline vandalism is a major source of oil spillage and environmental pollution in the Niger Delta area [1,5,20–23]. The Niger Delta accommodates the largest un-remediated oil-polluted area in the Gulf of Guinea [24]. Though oil spillage is common in most oil-producing countries [9], Kalejaye [22] reported that the Nigerian oil and gas industry has recorded the highest number of spillages, up to 9000 cases annually. A review of the Royal Dutch Shell oil and gas business sustainability report of 2018 shows that oil spillages from oil pipeline vandalism (sabotage) are peculiar to their operations in Nigeria. In fact, the quantity of crude oil spilled from pipeline vandalism alone in Shell's Nigerian operations almost surpassed the quantity of oil spilled from operational problems across their global operations combined [25]. Similarly, Obida et al. [26] note that the volume of crude oil spilled due to incidents of pipeline vandalism between 2007 and 2015 in the Niger Delta oil-producing communities is about 374,155.16 barrels, and up to 174,140.66 barrels were spilled from operational failures in the same area. However, the oil and gas host communities disagree with such reports [1]. For example, some farmers in the Oruma and Goi communities of the Niger Delta, who claimed that the Shell Petroleum Development Company of Nigeria was responsible for oil spills that ravaged local farmlands, recently won their case in a 29 January 2021 ruling by the Court of Appeals of the Hague, which held Shell liable and ordered that damages be paid to the farmers [27].

The Nigeria Extractive Industries' transparency initiative [28] reports estimated average daily crude oil losses to the tune of 150,000 barrels per day (bpd), and figures offered by government officials and private studies estimate that 400,000 bpd are lost. Watts and Zalik [29] report that the staging of non-transparent, incoherent, and/or intentionally misleading data on oil spills also appears in other jurisdictions. Nevertheless, oil spill figures reported by NEITI suggest that a fifth of Nigeria's daily crude oil production may be lost to theft and oil pipeline vandalism [28]. Aside from production losses, the cost of oil pipeline repairs is a major index of losses in the Nigerian oil industry [28,30].

Obida et al. [26] observe that 29% of the population in the Niger Delta live within a spill impact radius, as thousands of active crude oil spill sites are impacting rivers, farmlands, swamps, land areas, inland waters, and coastlands.

High concentrations of hydrocarbons have been recorded in sediment, soil, and water samples from oil-producing communities in the Niger Delta. Iwegbue et al. [21] found concentrations of *n*-alkanes (95 to 3430 $\mu g g^{-1}$) and polycyclic aromatic hydrocarbons

(PAHs) (0.75 to 213 $\mu g g^{-1}$,) in Escravos River Basin sediments that exceeded guideline values. A toxicity and risk assessment of polycyclic aromatic hydrocarbons in river bed sediments of an artisanal crude oil-refining area in the Niger Delta showed the range and mean of the total PAHs (∑16PAHs) of 23.461–89.886 mg/kg and 42.607 ± 14.30 mg/kg dry weight (dw), classified as heavily contaminated when compared to the European classification of PAHs' pollution in soil (>1.0 mg/kg) [31].

Concentrations of polycyclic aromatic hydrocarbons (PAHs) and nitrogen-containing analogues (N-PAHs) in Bonny Estuary, Niger Delta ranged from 8699–22,528 µg/kg and 503–2020 µg/kg for PAHs/N-PAHs, respectively, and the ΣPAH level in the estuarine segments was 45% higher than the Department of Petroleum Resources/Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (DPR/EGASPIN)'s intervention limit [32].

Soil samples collected at Ahoada communities showed high ranges of total petroleum hydrocarbon (TPH) (17.27–58.36 mg/kg), polycyclic aromatic hydrocarbons (0.43–77.54 mg/kg), and BTEX (0.02–0.38 mg/kg) in the impacted soil samples [33]. The concentrations of the pollutants in various environmental media exceed safe levels, and analyses show that the main contributors of PAHS into the environment are gas flaring inputs, the combustion of biomass, crude oil discharges from oil drilling platforms, pipeline vandalism, diesel engines, and other pyrogenic sources [21,31–33].

Oil pipeline vandalism is a major concern regarding crude oil pollution in the Niger Delta communities, which spans over several years [1]. Thus, Akinwumiju et al. [3] noted the need to engage indigenous people in addressing oil pollution issues. Government policies to curb oil pipeline vandalism (e.g., environmental campaigns, the occasional arrest and prosecution of vandals, granting of amnesty and economic empowerment programs for youths and military operations) have met with limited success because of a lack of inclusion of the indigenes in developing such policies [1,33–35].

1.2. Environmental Degradation and Environmental Identities in the Niger Delta

The Niger Delta environment is highly polluted, mostly from oil spillages and gas flaring from the activities of the oil and gas industry [2,15]. Madu and Kuei [1] found that oil pipeline vandalism contributes significantly to the environmental degradation in the Niger Delta area. The environmental and socioeconomic consequences of oil pollution and gas flaring in the Niger Delta have been documented [7,36]. Ezeasor and Ozougwu [37] discussed issues associated with the release of carbon dioxide (CO_2) and other greenhouse gases (GHGs) into the environment and the climate.

Ilevbare et al. [38] found a statistically significant association between environmental identity and quality of life of residents in the oil-producing community of Badagry, Nigeria. Some researchers suggest that significant life experiences, such as childhood experiences in nature, the experience of pollution or alterations to nature, and a love for the area in which a person is raised, etc., motivated certain individuals to take part in environmental activism [39,40]. However, as predicted by [41], humans are averse to environmental degradation, and consistent exposure may lead to degradation desensitization, which may be related to incessant oil pollution. In fact, exposure to environmental destruction may influence environmental behavior [40,42].

Individuals with a high environmental identity will tend to be more conscious of the preservation of nature, whereas those with a low environmental identity do not have much allegiance to protecting the natural environment [16,43].

Clayton [44] explained that environmental identity involves the ways in which people perceive and behave within their natural environment. Hence, an environmental identity scale [44] is one of the many constructs that have operationalized the concept of connection with nature [16].

Studies have shown that the levels of environmental identity among individuals vary across geographical locations [16]. This study assumes that there is an association between

the environmental identities and environmental attitudes of youths, and the socioeconomic environment may influence this association.

The Niger Delta area has been transformed from an agrarian society to a major oil-producing area over the last fifty years. The oil sector currently controls large expanses of land in rural areas of the Niger Delta, with thousands of kilometers of oil pipelines, flow lines, stock tanks, flow stations, and over 6400 oil wells. These facilities are networked in close proximity around residential communities [45]. In fact, the ecological consequence of the shift to a petroleum production region is being felt in the region today [4].

According to [46], over 13 million barrels of oil have been spilled in the Niger Delta ecosystem. Akinwumiju et al. [3] remarked that oil pollution has made the area inhabitable as a result of poor environmental quality and poor quality of life. The present research extends environmental identity studies to a developing country with a multi-faceted culture. This study may help to address some of the burning issues in environmental pollution and resource conflicts.

1.3. Attitude towards Oil Pipeline Vandalism in the Niger Delta

Oil pipeline vandalism is often an expression of grievance by militant youths from the oil-producing areas. These militants frequently complain of marginalization and neglect of the region [4]. Koos [5] points out that oil-related grievances abound in developing oil-rich countries, and they drive anti-state attitudes. Attitudes towards oil pipeline vandalism in the Niger Delta are investigated in this study. The aim is to verify whether youths' perceptions, values, and beliefs favor oil pipeline vandalism as a means of expressing grievances or whether they have pro-environmental attitudes towards the problem (i.e., attitudes that do not favor pipeline vandalism). In addition, we think that an attitude that is not pro-environmental is contributory to crude oil theft, which is carried out in a manner that often leaves the environment polluted.

The Niger Delta area hosts one of the richest wetlands in Africa [47], and the residents are predominantly farmers and fishermen. This wetland is increasingly being polluted due to the oil activities in the area. It is expected that the inhabitants of the area should adopt pro-environmental attitudes and behaviors. However, this view may be contradicted by the enormous problem of oil pipeline vandalism in the area.

Based on environmental risk perception theory, people make rational decisions and perform behavioral responses based on the information available to them [48]. In other words, people are more likely to avoid decisions that may lead to death or harm to people and cause environmental catastrophes. Thus, this research is based on the premise that a possible decline in environmental identity owing to incessant exposure to environmental pollution may interconnect with the general attitude towards oil pipeline vandalism in the area (see Figure S1 for the research model of this study).

Although pro-environmental attitudes and behavior are often discussed in the general media, and there are models of environmental behavior, mostly in western cultures [16,49–51], environmentally destructive attitudes are also important in understanding pro-environmental attitudes and behavior in developing countries. Thus, our specific objectives are as follows:

(i) To determine the environmental identities of youths in the study area.
(ii) To determine the youths' attitudes towards oil pipeline vandalism in the area.
(iii) To assess the socioeconomic variables associated with the environmental identities of youths in the area.
(iv) To assess the socioeconomic variables associated with youth's attitudes towards oil pipeline vandalism in the area.
(v) To determine any significant relationship between the environmental identities of the youths in the area and their attitudes towards oil pipeline vandalism.

1.4. Research Questions

The following research questions are therefore addressed:

1. Do youths in the study area have medium to high environmental identities?
2. Do youths in the study area have pro-environmental attitudes towards oil pipeline vandalism?
3. Are socioeconomic variables associated with the environmental identities of the youths?
4. Are socioeconomic variables associated with youths' attitudes towards oil pipeline vandalism?
5. Is there any significant relationship between the environmental identities of the youths in the area and their attitude towards oil pipeline vandalism?

1.5. Research Hypotheses

The following research hypotheses are used to answer the research questions:

H1: *The environmental identity scores of youths in the study area are low.*

H2: *Youths' attitudes towards oil pipeline vandalism in the area are not pro-environmental.*

H3: *Socioeconomic variables are not associated with the environmental identities of the youths in the area.*

H4: *Socioeconomic variables are not associated with youths' attitudes towards oil pipeline vandalism in the area.*

H5: *There is no significant relationship between the environmental identities of the youths in the area and their attitude towards oil pipeline vandalism.*

2. Materials and Methods

2.1. Participants and Procedure

The study adopted a cross-sectional survey design. Primary data were sourced using a questionnaire. The population for the study is made up of all the youths in the Niger Delta region (18–35 years). With a 5% margin of error, a 95% confidence interval, and an estimated youth population of 20 million [52], the recommended minimum sample size using the Raosoft online sample calculator (http://www.raosoft.com/samplesize.html (accessed on 23 July 2020)) was 385 persons [53]. Questionnaires were administered to 660 randomly selected youths, 220 from each of the sampled states, with a return rate of 91.36%. Interviews with community representatives and other relevant stakeholders, as well as focus group discussions with the young people, were held from February–August 2022. The survey had approval from the Centre for Environmental Management and Control Research Committee of the University of Nigeria (Ref: 2021-28).

Secondary data on the variables of interest were generated from relevant books, journals, oil company reports, and internet materials. A multistage sampling technique involving the use of the Nigerian Oil Spill Monitor (https://oilspillmonitor.ng (accessed on 17 May 2020)), an online map that shows official data on oil spills in Nigeria, secondary data, and interviews were applied to purposively select twelve host communities from three major oil-producing local government areas, namely: Warri South, Ogba-Egbema-Ndoni Local Government Area (ONELGA), and Yenagoa in the Delta, Rivers, and Bayelsa States, respectively, for the study [54].

Figure S2 shows the frequency of oil pipeline vandalism incidents in the selected local government areas (LGAs). The twelve oil-producing communities selected from the LGAs for the study include Okerenkoko, Ugbuwangue, Orugbo, Ubeji, Biseni, Ikarama, Zarama, Omoku, Idu, Ebocha, Eboburu, and Ogbogu.

In Figure S3, we generated data of crude oil spillage across the selected local government areas and the number of incidents and barrels of contaminants spilled in the selected LGAs between 2006–2021 using the Nigerian Oil Spill Monitor. The selected communities are mostly rural and semi-urban, and they record some of the highest numbers of oil pipeline vandalism incidents and oil spillages in the area. Figure S4 presents a map of the local government areas in the Niger Delta highlighting the spatial distribution of oil spill incidents from oil pipeline vandalism. The red spots in the map represent areas that recorded oil spills in the period from 2007 to 2015, and the three areas outlined in green

represent the local government areas from which the twelve oil-producing communities were selected for the study.

2.2. Measures

Data collection was carried out through face-to-face administration of questionnaires (see Appendix A) to participants. A small subset of the sample (n = 14) participated in focus group discussions, and ten experts were interviewed. The questionnaire for the study comprised the environmental identity (EID) scale developed by [44]. The EID scale measures the degree to which an individual identifies himself as part of nature, and vice versa [55]. A scale was also used to measure attitudes towards oil pipeline vandalism (ATOPV). In addition, several questions were posed on socioeconomic variables. Experts were used to conduct content validity on the questionnaire instruments. The EID and ATOPV scales were validated using a sample of thirty-five youths in a pilot study. Some minor modifications were made to the questionnaire (Appendix A).

2.2.1. Environmental Identity Scale

The EID scale comprised 24 items [44] placed on a 5-point Likert scale ranging from "strongly agree" (=5) to "strongly disagree" (=1). Scores on this scale range from a minimum of 24.00 to a maximum score of 120.00. Scores between 24–72 indicate low identification, scores between 72–95 indicate medium identification, and those between 96–120.00 indicate high identification (Table 1). The scale includes statements regarding how the respondent identifies with the environment (e.g., "I feel that I have a lot in common with other species"; "Living near wildlife is important to me"; "I would not want to live in a city all the time"). Clayton [44] and other researchers have previously demonstrated the reliability of the scale. In the present study, the items of the environmental identity scale yielded an internal consistency reliability (Cronbach's alpha) of 0.82. The Kaiser–Meyer–Olkin Measure of Sampling Adequacy for the EID scale was 0.83, and Bartlett's test of Sphericity yielded 474.95.

Table 1. Summary data of environmental identity and attitude towards oil pipeline vandalism scores.

	Scale	Mean Score	Standard Deviation	*p*-Value	Remarks (Score Range)
1	Environmental identity (EID)	92.0	12.48	0.0000	96–120 (high EID score) 72–95 (medium EID score) <72 (low EID score)
2	Attitude to oil pipeline vandalism (ATOPV)	34.37	3.70	0.0000	32–40 (pro-environmental attitude) 24–31 (medium pro-environmental attitude) <24 (environmentally destructive attitude)

2.2.2. Attitude towards Oil Pipeline Vandalism

The attitude towards oil pipeline vandalism (ATOPV) scale consists of 8 items placed on a 5-point Likert scale based on previous qualitative research [5,7,15,56]. Eight statements were developed to measure attitudes towards oil pipeline vandalism on a 5-point scale from "strongly agree" to "strongly disagree". The ATOPV scale yielded an internal consistency reliability (Cronbach's alpha) of 0.88 ($\alpha \geq 0.7$). The Kaiser–Meyer–Olkin Measure of Sampling Adequacy for the ATOPV scale was 0.80, and Bartlett's test of Sphericity yielded 159.37 ($p < 0.001$). Loading of the items of the scales on the single factor were mostly 0.21 to 0.89. Principal component analysis indicated that the scale formed two distinct components, accounting for 43% of variance:

Component 1 (4 items) comprised negative attitudes. These items were:

1. Oil pipeline vandalism is a good way to demand settlements from the Federal Government and oil companies for polluting the environment.
2. Oil pipeline vandalism is a good way to demand justice from the Federal Government and oil companies operating in our area.
3. I will join pipeline vandalism business if offered protection.
4. I will consider pipeline vandalism if I have serious financial needs.

Component 2 (4 items) comprised positive attitudes. These items were:

1. I will report it to the authorities if I find out that some young people in my community are planning to vandalize pipelines.
2. I have not made any effort to benefit financially from vandalized pipelines.
3. The breaking of pipelines by militants is not the right way to fight injustice and underdevelopment in the oil-producing area.
4. Oil pipeline vandalism causes oil pollution and should be stopped.

2.2.3. Qualitative Data

Interviews of participants and discussions from the focus group were used to generate further information on the views and experiences of the participants regarding oil pipeline vandalism. The participants in the interviews and focus group discussions were mostly (80%) males with post-secondary academic backgrounds, except for two host community representatives who had only secondary school-level education. Their consent was obtained for the interviews, and they were interviewed at locations of their choice. Professional ethical guidelines of informed consent and confidentiality were followed for the interviews and the focus group. Samples of the transcribed interview texts were submitted to an independent panel of experts to evaluate the validity of the categories. They were assessed to be acceptable.

Sample questions for the interviews and the focus group discussion included:

1. What are the main causes of conflict in the area?
2. How do young people protest perceived injustices by the government and multinational oil companies (MNOCs)?
3. Who are the main perpetrators of oil pipeline vandalism in the area?
4. What are the general feelings and attitudes of young people regarding oil pipeline vandalism in the area?

2.3. Data Analysis

The data were analyzed using the Statistical Package for Social Sciences (SPSS). A *t*-test was used to test the mean difference between environmental identity and attitude towards pipeline vandalism. It was also used to test the mean difference in attitude towards pipeline vandalism and environmental identity based on gender, marital status, and ownership of farmland, experience of pollution on farmland, and experience of pollution on the community's land. A one-way ANOVA was used to compare the difference in the means of the socioeconomic groups (occupation, education, source of income, level of income, and length of residency) based on the youths' environmental identities and attitudes towards pipeline vandalism mean scores at 0.05 levels of significance.

Pearson's correlation coefficient was used to test for significant relationships between age and environmental identity mean scores, age, and attitude towards pipeline vandalism mean scores, as well as attitude towards pipeline vandalism and environmental identity mean scores. Content analysis was used to analyze the qualitative data.

3. Results

Six hundred and three youths completed the survey, fourteen participated in focus group discussions, and ten experts and stakeholders were interviewed. As shown in Appendix A, generally, more males (53.4%) completed the survey than females, and the majority of the participants were students (56.9%). More than half of the total number of

participants (62.4%) had no source(s) of income. A large proportion of the participants have lived in the area for more than 15 years, and more than half of the total number of participants (52.9%) believed that their communities were polluted.

3.1. Environmental Identities of Youths in the Area and Their Attitudes towards Oil Pipeline Vandalism

As seen in Table 1, the mean score for environmental identity was 92.0 with a standard deviation (SD) of 12.48, and the mean score for the attitude towards oil pipeline vandalism was 34.37 (SD = 3.70) against the benchmarks of 72 for medium environmental identity [55] and 32 for medium pro-environmental attitude towards oil pipeline vandalism, respectively. These scores were tested against the benchmarks using the *t*-test for one sample. The test showed a statistically significant difference between the observed results and the benchmarks, as seen on Table 1, for both cases. Thus, we can infer that there are higher environmental identities and higher pro-environmental attitudes in the area.

3.2. Socioeconomic Variables Associated with Environmental Identities of the Youths

The results of differences in environmental identity on account of gender, marital status, ownership of farmland, pollution of farmland, and pollution of the community are summarized in Table 2. There was a significant difference between male and female participants in terms of environmental identity scores. Female participants reported higher environmental identity scores than the male participants. Marital status, ownership of farmland, pollution of farmland, and pollution of the community did not significantly influence environmental identity scores.

Table 2. *T*-test for differences in environmental identity on account of gender, marital status, ownership of farmland, pollution of farmland, and pollution of community.

Factor	Group	Mean	SD	Mean Difference	T	*p*-Value	DF
Gender	Males	90.56	12.40	−3.06	−3.02 *	0.003	601
	Females	93.64	12.42				
Marital status	Single	91.88	12.46	−1.68	−0.87 ^{NS}	0.400	601
	Married	93.56	12.84				
Ownership of farmland	Yes	92.10	12.35	0.21	0.21 ^{NS}	0.840	601
	No	91.89	12.67				
Pollution of farmland	Yes	90.99	12.28	−1.75	−1.70 ^{NS}	0.100	601
	No	92.74	12.60				
Pollution of community	Yes	91.58	12.89	−0.89	−0.88 ^{NS}	0.400	601
	No	92.48	12.02				

^{NS}—not statistically significant, DF—degrees of freedom, * $p < 0.05$.

The occupation of participants significantly influenced environmental identity, as participants who were in teaching professions recorded the highest environmental identity scores versus those that engaged in farming and fishing. The level of education significantly influenced environmental identity scores, as participants who had university degrees reported higher environmental identity scores than those who had only secondary school education and those who had no formal education. Equally, sources of income yielded a significant influence on environmental identity, as participants whose sources of income were from formal employment reported higher environmental identity scores than those who had no source of income. Similarly, the level of income significantly influenced environmental identity. Participants with higher incomes seemed to have higher environmental identity scores than those with low income levels. The length of residency in the area did not have any significant influence on environmental identity scores. These results are summarized in Table 3.

Table 3. One-way ANOVA results for influence of occupation, education, source of income, level of income, and length of residency in the area on environmental identity.

Factor	Sum of Squares	DF	Mean Square	*p*-Value	F
Occupation	3894.67	(8, 594)	486.83	0.001	3.21 *
Education	12,350.59	(4, 498)	3087.65	0.000	22.65 *
Source of income	2566.61	(4, 598)	641.65	0.002	4.20 *
Level of income	3727.74	(5, 597)	745.54	0.000	4.94 *
Length of residency in the area	829.36	(2, 600)	414.68	0.070	0.2.68 ^{NS}

^{NS}—not statistically significant, DF—degrees of freedom, * $p < 0.05$.

3.3. Socioeconomic Variables Associated with Youths' Attitudes towards Oil Pipeline Vandalism

A correlation between age and the participants' attitudes towards oil pipeline vandalism scores showed that age was positively correlated with attitude towards oil pipeline vandalism ($r = 0.15$, $p = 0.000$), as older age was associated with pro-environmental attitudes towards oil pipeline vandalism.

Marital status, ownership of farmland, pollution of farmland, and pollution of the community were not significantly associated with attitudes towards oil pipeline vandalism. See Table 4 for the results of *t*-test statistics presenting differences in attitudes towards crude oil pipeline vandalism on account of gender, marital status, ownership of farmland, pollution of farmland, and pollution experienced in the community.

Table 4. *T*-test for differences in attitude towards pipeline vandalism on account of gender, marital status, ownership of farmland, pollution of farmland, and pollution of community.

Factor	Group	Mean	SD	Mean Difference	T	*p*-Value	DF
Gender	Males	34.67	3.01	0.65	7.38 ^{NS}	0.118	601
	Females	34.03	3.13				
Marital status	Single	34.40	3.06	0.36	0.21 ^{NS}	0.98	601
	Married	34.04	3.16				
Ownership of farmland	Yes	34.74	3.09	0.86	0.99 ^{NS}	0.33	601
	No	33.90	3.03				
Pollution of farmland	Yes	34.85	3.04	0.35	0.94 ^{NS}	0.13	601
	No	34.02	3.18				
Pollution of community	Yes	34.21	3.71	0.35	−0.40 ^{NS}	0.70	601
	No	34.56	3.70				

^{NS}—not statistically significant, DF—degrees of freedom.

The occupation of the participants was significantly associated with attitude to oil pipeline vandalism, as participants who engaged in farming showed more pro-environmental attitudes towards pipeline vandalism than artisans and students. The level of education was also significantly associated with attitude to pipeline vandalism, as participants who had tertiary school education reported more pro-environmental attitudes towards oil pipeline vandalism than those who had only secondary school education and those with no formal education. The source of income of the participants yielded a significant influence on their ATOPV scores, as participants whose source of income came from formal employment reported more pro-environmental attitudes towards oil pipeline vandalism than those who had no source of income. The level of income also significantly influenced the attitude to oil pipeline vandalism, as participants with higher incomes showed more pro-environmental attitudes towards pipeline vandalism than those with lower incomes. Length of residency in the area did not have any significant influence on the attitude towards pipeline vandalism (see Table 5).

Table 5. One-way ANOVA results for influence of occupation, education, source of income, level of income, and length of residency in the area on attitude towards pipeline vandalism.

Factor	Sum of Squares	DF	Mean Square	*p*-Value	F
Occupation	1999.15	(8, 594)	249.89	0.025	2.22 *
Education	1418.69	(4, 498)	354.67	0.014	3.14 *
Source of income	3339.71	(4, 598)	834.927	0.000	7.61 ***
Level of income	3446.53	(5, 597)	689.31	0.000	6.28 ***
Length of residency in the area	11.12	(2, 600)	5.56	0.953	0.05 ^{NS}

^{NS}—not statistically significant, DF—degrees of freedom, * $p < 0.05$; *** $p < 0.001$.

Qualitative Data

For the qualitative data, thematic analysis was adopted to identify recurring themes. Important socioeconomic variables were captured from the interview and focus group responses with respect to the research questions, which represent some level of patterned responses and/or meaning within the data set.

Qualitative data yielded additional factors underlying participants' good environmental knowledge, pro-environmental attitudes, and poor socioeconomic conditions. The thematic units identified and the quotations that support the themes are presented in Table 6 below. Most of the participants did not agree that crude oil pipeline vandalism was mostly perpetrated by youths. Most participants (75%) implicated oil company staff and government workers as perpetrators of oil pipeline vandalism in connection with some local community members.

Table 6. Major recurring themes and subthemes drawn from the interviews and focus group discussion.

	Theme	Subtheme
1	Lack of alternative means of livelihood	Anger from feeling of neglect, destruction of the environment, and lack of alternative sources of livelihood Exclusion of youths from oil and gas businesses and benefits Opportunities for pipeline vandalism provided by a powerful syndicate
2	Quest for material needs	Bad example from MNOCs and the government Lack of feeling of proprietary interest about/care towards the environment

After meanings were coded, poverty and the quest for material needs were identified as major challenges and were the two recurring themes. Thus, the role of poverty and economic interests resonated from the participants' responses, which support the quantitative data to answer the third research question. Fifty percent of the interviewees did not agree that pipeline vandalism contributed up to 70% of oil pollution in the area. Forty percent of participants argued that pipeline vandalism did not involve total community participation. However, the majority (80%) of participants agreed that due to the problem of underdevelopment and poverty in the region, the community might be more sympathetic to vandals. One of the interviewees pointed out that their community might like to stop pipeline vandalism, but they thought it was risky to confront the vandals. Respondents recommend swift detection, the remediation of oil spillages, and the provision of alternative livelihoods through the development of skills as ways to combat pipeline vandalism. Furthermore, there is a general sense of apathy towards the government, as feelings of neglect and a belief in the denial of shared benefits from oil was generally felt. Most of the respondents (over 70%) argued that the best deals they expected to obtain from the government and MNOCs were oil pipeline surveillance and security jobs/contracts.

Some gains appear to be made when there is inclusion of community agitators in the security of oil facilities due to their knowledge of activities in the area. For instance, a recent USD 100,000-a-year contract awarded to a former Niger Delta militant, Government Ekpemupolo (a.k.a. Tompolo), in the area has started to produce intelligence reports of massive illegal oil bunkering and oil theft for the state's security agencies [57]. However, the coordination and sharing of such contracts have also generated conflict within the oil-producing communities [58]. Some of the responses of the interviewees and FGD participants when asked to describe the attitudes of young people towards pipeline vandalism were as follows.

FGD Participant No. 1: "The thing is that the girls and younger boys are not likely to be involved but the older ones. Those vandals are highly skilled people. The agitators like Tompolo and others know them (criminal syndicates) that's why they are been opposed".

FGD Participant No. 2: "Oil pipelines have been buried for more than 50 years ago without maintenance and there are some criminal syndicates that are involved in this thing".

FGD Participant No. 3: "When pipeline vandalism started it was done for economic gains. Communities colluded with the oil company officials to cause the problem so they complain about spillage in their farms and get compensated for their farms and fishing gears".

FGD Participant No. 4: "Marginalization is the cause, people that come from outside the region own the oil blocks here. Go to the creeks and see how people live in shanties and terrible conditions".

Interviewee No. 1: "You think the people who are involved in pipeline vandalism do not care about the effect on the environment. The opposite is the case".

Interviewee No. 2: "People want benefits of oil and gas developments. They want socioeconomic development. The boys know that oil pollution is inimical to the environment".

3.4. Relationship between the Environmental Identities of the Youths of the Area and Their Attitudes towards Pipeline Vandalism

Environmental identity (EID) scores and attitude towards pipeline vandalism (ATOPV) scores were correlated using Pearson correlation. However, Pearson's correlation did not provide compelling evidence for a significant association between environmental identity and attitude towards pipeline vandalism in the area ($r = 0.07$, $p = 0.10$).

4. Discussion

4.1. Environmental Identities of Youths of Oil-Producing Communities and Their Attitude towards Pipeline Vandalism

The results showed medium to high environmental identity amongst the majority of the youths and a predominant pro-environmental attitude towards oil pipeline vandalism. These positive outcomes may be attributed to:

(i) The high number of students and female participants involved in our survey, as gender and higher education are positively associated with environmental identity scores [49,59,60].
(ii) The practice of local environmental knowledge transfer in the area [17].
(iii) Traditional occupations of farming and fishing in the area as a source of environmental knowledge.
(iv) High environmental awareness from lifelong experiences of environmental devastation in the area.

Similar to our findings, Adejoke, Andile and Murembiwa [61] reported that secondary school students from a coal-mining province had higher mean scores for awareness and knowledge of and attitude towards the environment in comparison to their counterparts from a non-coal-mining province.

From the positive outcomes regarding the environmental identities and attitudes towards oil pipeline vandalism of the participants in our study, one may begin to wonder why the issue of oil pipeline vandalism is as widespread as reported in the literature.

From recent discoveries by Tompolo's Tantita Security Services, revealing several tapping points used by oil thieves and the high level of sophistication involved in connecting illegal pipelines to the main line [23,30,57], we are able to infer that the new trend of oil pipeline vandalism can only be organized by powerful criminal syndicates who may co-opt some locals [23,57]. This finding is consistent with the report that the locals attributed higher severity to pipeline vandalism than to other environmental hazards in the area [62].

Assertions have been made in earlier studies that crude oil pipeline vandalism is an organized crime by powerful syndicates, but this is usually dismissed, as the locals (especially youths) are "conveniently" blamed for the problem of oil pipeline vandalism [8–11,14,63].

4.2. Socioeconomic Factors Associated with the Youths' Environmental Identities

As we mentioned above, females show higher environmental identities and pro-environmental attitudes than males. This is consistent with the results of similar studies [49,59,60].

Occupation, gender, level of education, and income were the socioeconomic factors most associated with environmental identity scores in this study, as the more educated youths and those who earned regular income from their jobs reported higher environmental identity scores. This finding is in agreement with the report of richer and more educated people having higher environmental identities and concerns [44,64]. Our findings signify the importance of socioeconomic variables in maintaining sustainable attitudes and behaviors, especially in the regions with pressing economic problems. The lowest environmental identity scores were among the youths with no formal education. The length of residence in the area and experience of pollution were not significantly associated with environmental identity. This is in contrast to our premise that the experience of pollution may likely affect the environmental identities of the youths in the area and, consequently, the way they perceive their role in the environment.

4.3. Socioeconomic Factors Associated with Youths' Attitude towards Pipeline Vandalism in the Area

The findings of the influence of socioeconomic conditions, especially education, income, and occupation, underscore the importance of examining the attitudes towards oil pipeline vandalism and the factors that influence attitudes towards oil pipeline vandalism in the Niger Delta area. As also indicated in our results, age and educational level have been positively associated with environmental attitudes in previous studies [65,66]. The Niger Delta of Nigeria is rated as the most deprived region in Nigeria. Although it is the economic powerhouse of the country due to its rich reserves of crude oil and natural gas, the people of the region have not really benefited from these resources. The area is often viewed as one of resource curse as most sections are polluted from exploration activities. The attitudes of the residents towards oil pipeline vandalism may be attributed to the changing materialistic value system [12,36]. Madu and Kuei [1] also note that politicians and local officials who flaunt ill-gotten gains help to fuel conflicts. Hence, the prominence of economic variables in influencing attitudes towards pipeline vandalism is collaborated in this study.

Poverty and the need for a materialistic lifestyle are reported as drivers of attitudes towards oil pipeline vandalism from the qualitative study. Thus, attacks on oil pipelines may be motivated more by economic reasons than by apprehensions about the exploitation of the resources and subsequent pollution of the area.

The influence of education on attitudes towards pipeline vandalism is significant, since one of the components of attitude is cognition. Our findings underscore the importance of carrying out a social impact assessment in solving the oil pipeline vandalism problem and of the sustainable planning of oil and gas operations in the area. There is, therefore, a need for a robust environmental and social management plan that will include educating the residents and providing alternative means of livelihoods to victims of oil pollution. Community changes may influence perceptions and attitudes, which can affect the daily lives of individuals and societies in different ways.

4.4. Relationship between Environmental Identities of the Youths in the Area and Their Attitude towards Pipeline Vandalism

No significant relationship was obtained between environmental identities and the youths' attitudes towards oil pipeline vandalism. It is possible for individuals to hold an environmental identity and still express a certain behavior that is incongruous with their environmental identity [67]. For instance, Okpo and Eze [68] reported that the Niger Delta agitators generally believe that oil pipeline vandalism will induce the government to increase revenue allocation to the area. This may appear to be in contrast with our findings of pro-environmental attitudes towards pipeline vandalism. However, Edino et al. [15] note that a mix of factors, including economic benefits, political allegiance, and religious views, compete with education and the experience of environmental hazards in modeling environmental attitudes of the people in the Niger Delta.

In this study, environmental identity does not predicate the attitude of youths towards oil pipeline vandalism. In fact, from our findings, socioeconomic factors were more significantly associated with attitudes towards oil pipeline vandalism than environmental identity. More attention should be paid to improving the socioeconomic conditions of the Niger Delta, as these have shown to have more influence on attitudes towards oil pipeline vandalism. The youths' environmental identity scores do not appear to predict their reactions to oil pipeline vandalism. Future research may look at both youth and non-youth, considering their environmental identities and attitudes, and the interactions between environmental identity and socioeconomic factors. The mix of environmental identity and socioeconomic factors may affect environmental attitudes towards oil pipeline vandalism.

5. Conclusions

In this paper, we have examined the environmental identities and attitudes of youths towards crude oil pipeline vandalism in the Niger Delta area of Nigeria. We conclude that regardless of prevalent oil pollution in Niger Delta oil-producing communities, environmental identities of youths fall into medium to high levels in the environmental identity (EID) scale, and their attitudes towards pipeline vandalism are mostly pro-environmental. Our data show that for both variables, females measured more positively than males, and the lowest scores were among youths with no formal education.

Some of the key findings of the research can be summarized as follows:

1. Socioeconomic factors that significantly influence environmental identities in the area include occupation, educational attainment, and source and level of income, as the more educated youths and those who earned regular appreciable incomes from their jobs had higher environmental identity scores.
2. Similarly, socioeconomic factors that significantly influence attitudes towards pipeline vandalism include occupation, educational attainment, and source and level of income, with age also showing a significant relationship. Hence, youths that were older, more educated, and those with regular and/or appreciable incomes reported higher pro-environmental attitudes towards pipeline vandalism. The recurring theme of a lack of alternative means of livelihood in the qualitative data complemented our findings from the quantitative study.
3. Other socioeconomic factors, including the length of one's residency and one's experience of pollution in the area, were not statistically significant. This is in contrast to our premise that the experience of pollution may likely affect the environmental identities of youths and, consequently, the way they perceive their role in the environment.
4. There is no significant association between environmental identities and attitudes towards pipeline vandalism.

This study underscores the importance of socioeconomic variables in maintaining sustainable attitudes and behaviors, especially in regions with pressing economic problems. Attitudes towards oil pipeline vandalism in the Niger Delta are of utmost importance, since the Niger Delta, as a major crude oil-producing area, is the mainstay of Nigeria's economy. By examining the attitudes of youths towards oil pipeline vandalism in the Niger Delta

and the factors that influence them, policymakers can gain more insight into the sources of oil pipeline vandalism and listen directly to the opinions of youths about the conflict. Such findings can help to guide policymakers and planners to optimize research outcomes to achieve security of oil and gas pipelines, environmental sustainability, sustainable planning and production in the Nigerian oil and gas industry, and youth development in the Niger Delta.

Hence, we suggest that the education and empowerment of the youth, as well as the sustainable development of the Niger delta area, must be actively supported by stakeholders. We also infer that if the youths of the Niger Delta are better empowered to be able to fend for themselves against government handouts (e.g., through amnesty program allowances) provided to some of them, they will become more pro-environmental in their attitudes towards pipeline vandalism, and they will also become stakeholders in protecting oil pipelines. Thus, were they to be lured by a criminal syndicate with financial rewards or by a militia group to join a crude oil pipeline vandalization operation, they would decline participation in such illegal and environmentally-destructive activities.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/su15065610/s1, Figure S1: Research Model identifying the main causes of crude oil spillage in the Niger Delta and some Environmental psychology perspectives. Figure S2: Map showing Selected LGAs for the Study and Differences in Number of Incidents (Adapted from Nigerian Oil Spill Monitor). Figure S3: Major LGAs from Rivers, Bayelsa and Delta States with the Number of Incidents and Barrels of Contaminants that are Spilled in the Areas between 2006–2021. (Adapted from Nigerian Oil Spill Monitor [54]. Figure S4: Spatial distribution of pipeline oil spills from 2007 to 2015 in the Niger Delta and the Study area (Local Government Areas) outlined in green. Adapted from [26].

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Data Availability Statement: The data set presented in this study is openly available at https://data.mendeley.com/datasets/62x26ngh6v accessed on 14 March 2023.

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Appendix A. Questionnaire

Center for Environmental Management and Control, University of Nigeria

Background information

1. What is your State of origin? _____ and L.G.A_____

2. How old are you? _____ 3. What is your sex? Male ☐ Female ☐

4. What is your marital status? Single ☐ Married ☐

5. What is your occupation? Farming ☐ Fishing ☐ Teaching ☐ Oil worker ☐

Civil servant ☐ Trader ☐ Artisan ☐ No work ☐ Other (please specify_____)

6. What is the highest level of education you have completed?

University or college ☐ Secondary school ☐ Primary school ☐ Technical training ☐ No formal education ☐

7. What kind of income do you receive?

Earnings from employment ☐ or self-employment amnesty program allowance ☐

Family Support ☐ Other government benefits ☐ Interest from savings and investments ☐

No source of income ☐

8. How much did you earn during the past 12 months?

(Less than NGN 30,000) ☐ (NGN 30,000–N100,000) ☐ (NGN 100,000–N300,000) ☐

(NGN 300,000 and above) ☐ Don't know ☐

9. How long have you been living here in the Niger Delta?

Less than 5 years ☐ 6 to 15 years ☐ 15years and above ☐

10. Do you or any member of your household have any farmland(s)?

Yes ☐ No ☐

11. Have you ever experienced oil spillage on your farmland in the past?

Yes ☐ No ☐

12. Have you ever experienced oil spillage in your neighborhood in the past?

Yes ☐ No ☐

Please check (✔) and rate yourself based on what you actually do, given the statements, using the following scales: (5—strongly agree,4—agree,3—undecided,2—disagree,1—strongly disagree)

S/N	Environmental Identity Scale	5	4	3	2	1
1.	Spending a lot of time in natural settings is important to me.					
2.	Engaging in environmental behaviors (planting a tree, gardening, proposer waste disposal, etc.) is important to me.					
3.	I think of myself as a part of nature, not separate from it.					
4.	If I had enough time or money, I would certainly volunteer some of it to working for environmental causes.					
5.	When I am upset or stressed, I can feel better by spending some time outdoors "communing with nature".					
6.	Living near wildlife is important to me; I would not want to live in a city all the time.					
7.	I have a lot in common with environmentalists as a group.					
8.	I believe that some of today's social problems could be cured by returning to a more rural lifestyle in which people live in harmony with the land.					
9.	I feel that I have a lot in common with other species.					
10.	I like to garden.					
11.	Being a part of the ecosystem is an important part of who I am.					
12.	I feel that I have roots to a particular geographical location that had a significant impact on my development.					
13.	Behaving responsibly toward the earth—living a sustainable lifestyle—is part of my moral code.					
14.	Learning about the natural world should be an important part of every child's upbringing.					
15.	In general, being part of the natural world is an important part of my self-image.					
16.	I would rather live in a small room or house with a nice view than a bigger room or house with a view of other buildings.					
17.	I really enjoy camping and hiking outdoors.					
18.	Sometimes I feel like parts of nature—certain trees, or storms, or mountains—have a personality of their own.					
19.	I would feel that an important part of my life was missing if I was not able to get out and enjoy nature from time to time.					
20.	I take pride in the fact that I could survive outdoors on my own for a few days.					
21.	I have never seen a work of art that is as beautiful as a work of nature, such as a sunset or a mountain range.					
22.	My own interests usually seem to coincide with the position advocated by environmentalists.					

S/N	Environmental Identity Scale	5	4	3	2	1
23.	I feel that I receive spiritual sustenance from experiences with nature.					
24	I keep mementos from outdoors such as shells in my room.					
	ATOPV Scale (5–strongly agree, 4–agree, 3–undecided, 2–disagree, 1– strongly disagree)	5	4	3	2	1
1.	Pipeline vandalism is a good way to demand settlement from the federal government and oil companies for polluting the environment.					
2.	Pipeline vandalism is a good way to demand justice from the federal government and oil companies operating in our area.					
3.	I will join pipeline vandalism business if offered protection.					
4.	I will consider pipeline vandalism if I have serious financial needs.					
5.	I will report it to the authorities if I find out that some youths in my community are planning to vandalize pipelines.					
6.	I have not made any effort to benefit financially from vandalized pipelines.					
7	The breaking of pipelines by militants is the right way to fight injustice and underdevelopment in an oil-producing area.					
8	Pipeline vandalism causes oil pollution and should be stopped.					

Appendix B. Socioeconomic and Demographic Characteristics of Study Participants

		%
Gender	Male	53.4
	Female	46.6
Marital status	Single	92.5
	Married	7.5
Occupation	Farming	8.6
	Fishing	4.6
	Teaching	5.0
	Oil worker	1.2
	Civil servant	3.2
	Trader	6.0
	Artisan	6.8
	No work	7.8
	Student	56.9
Highest level of education	University	15.8
	Secondary school	76.9
	Primary school	3.0
	Technical	3.0
	No formal education	1.3
Source of income	Employment	21.4
	Amnesty program	6.8
	Family support	8.8
	Savings interest	0.7
	None	62.4
Income over the past 12 months	Less than NGN 30,000	13.19
	NGN 30,000–N100,000	21.1
	NGN 100000–N300,000	2.0
	NGN 300,000 and above	0.3
	Don't know	8.3
	None	54.4
Length of residency in the area	Less than 5 years	2.8
	6–15 years	9.3
	15 years and above	87.9

		%
Farmland owned	Yes	55.2
	No	44.8
Farmland polluted	Yes	42.3
	No	57.7
Community polluted	Yes	52.9
	No	47.1

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