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Community Perception and Adaptive Response to Recurrent Oil Spills: Evidence from Ewelesuo, Nembe Creek, and Oluasiri Communities in Nembe, Bayelsa State, Nigeria

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Abstract

Repeated oil spillage in the Niger Delta, especially in the Nembe Local Government Area of Bayelsa State, has ultimately resulted in a permanent state of ecological crisis, livelihood loss, and loss of institutional hope. This paper aimed to analyse community perception and the ways that the community has adapted to oil spills in Ewelesuo, Nembe Creek, and Oluasiri. A mixed-methods design aided the collection of the data by means of 387 household surveys, six FGDs, and eight KIIs. Descriptive statistics, chi-square test, Spearman correlation, logistic regression, PCA, and cluster analysis were used as quantitative forms of analysis. The findings included that in relation to spill frequency; 89.7% of the respondents indicated that they had frequent spells and there were strong associations between the frequency of spills in perception and the changes in the type of livelihood ($r = 0.614$, $p < 0.001$) and the risk perception and the behaviour of storage of water ($r = 0.473$, $p = 0.003$). Regression indeed indicated no significant predictors of reporting behaviour, whereas logistic regression indicated that reporting behaviour was suppressed relative to institutional mistrust. The strategies of adaptation at the community and the individual level were identified through PCA, and spatial variance in the resilience was identified through clustering. Health risks, the exclusion of compensation, and coping with indigenous measures

were affirmed through qualitative data. The paper brings contributions to the environmental risk theory in that, under structural oppression, it is not true that what is perceived would always be acted upon. It proposes local management, a grassroots anti-surveillance, and the integration of local knowledge into the policy of remediation. Institutional change and social justice are needed to deal with ecological depression.

Keywords: Recurrent Oil Spills, Community-Based Adaptation, Environmental Risk Perception, Institutional Distrust, Eco-Governance Failure

Introduction

Paradoxically, the Niger Delta region of Nigeria, which is generally considered one of the most petroleum-blessed areas in sub-Saharan Africa, typifies the ecological implications of extractive capitalism, environmental mismanagement (Watts, 2008; UNEP, 2011). Its most recalcitrant complications happen to be oil spillage, which is a frequent event that has had a devastating effect on both terrestrial and marine environments, livelihoods, and exposed human populations to sustained health risks (Nriagu *et al*., 2016; Olalekan *et al*., 2020). Likely due to oil companies and governmental agencies framing the causes of the spills as pipeline sabotage and vandalism, the independent agencies which have reviewed the topic have estimated that a large proportion of the spills occur due to equipment failures, corrosion, and inadequate maintenance (Amnesty International, 2016; Ebeku, 2021). Though oil spills have been pervasive and recurrent within communities like Ewelesuo, Nembe Creek, and Oluasiri within Bayelsa State, the scholarly and policymaking on the topic continue to belong to the technocratic tradition, that is, establishing volumetric indices of oil spills, pollution clean-up procedures, and legal responsibilities, without addressing the reality of human experience at the ground level (Okonta & Douglas, 2001; Islam et al., 2023; Akpomuvie, 2011). However, it happens that it is in such communities that the components of the social, psychological, and behavioural aspects of environmental tragedies are well-experienced. Higher-order factors that help shape local perceptions of risk of oil spillage include a historical memory, socio-political marginalisation, and the cultural ecology, besides depending on empirical exposure (Obida *et al*., 2018). These sentiments have quite pervasive effects on adaptive behaviours, such as diversification of livelihoods, customary forms of investment redress, and collective action at the community level (Olsson *et al*., 2004; Leach *et al*., 2010).

Oil spillage reaction according to the community approach is premised on socio-ecological compound systems. Where there is no early or adequate institutional

response, the targeted communities evolve ways of unofficial surveillance, using conventional methods of phytoremediation, and kinship systems as sources of resilience to cope with frequent environmental shocks (Oviasuyi & Uwadiae, 2010; Ite *et al*., 2013; Ite & Ibok, 2013). Variances in these responses, wherein on one end of the spectrum is the proactive adaptation and on the other end is passive resignation, reflect impacts of the social capital, past exposure experience, and institutional trust. However, these processes are less documented in environmental policy and less theorised when it comes to being central to community resilience. In this regard, this paper will focus on filling up this important gap by seeking to understand how communities that lie in the path of the Nembe Creeks Trunk Line, namely, Ewelesuo, Nembe Creek, and Oluasiri, conceptualise and adjust to repeated instances of oil spills. This study is placed in the theoretical framework of the Risk Perception Theory (Slovic, 1987) and Social-Ecological Resilience Framework (Folke *et al*., 2002), which provides the researcher with a deeper level of interpretation of how human systems perceive environmental risks, and how they come up with absorb, adapt, or transform mechanisms in order to respond to environmental disturbances. The study produces knowledge that can inform policy by developing empirically based and policy-relevant findings through a mixed methods methodology, which constitutes a combination of both quantitative numerical results in the form of survey data and qualitative results of focus groups and key informants. The research is grounded in the voices of the affected communities; hence, it forms part of expanding research that refutes the logic of extractivism and promotes community-based practices on the challenges associated with an oil spill in Nigeria, which is both participatory, context-sensitive, and justice-oriented.

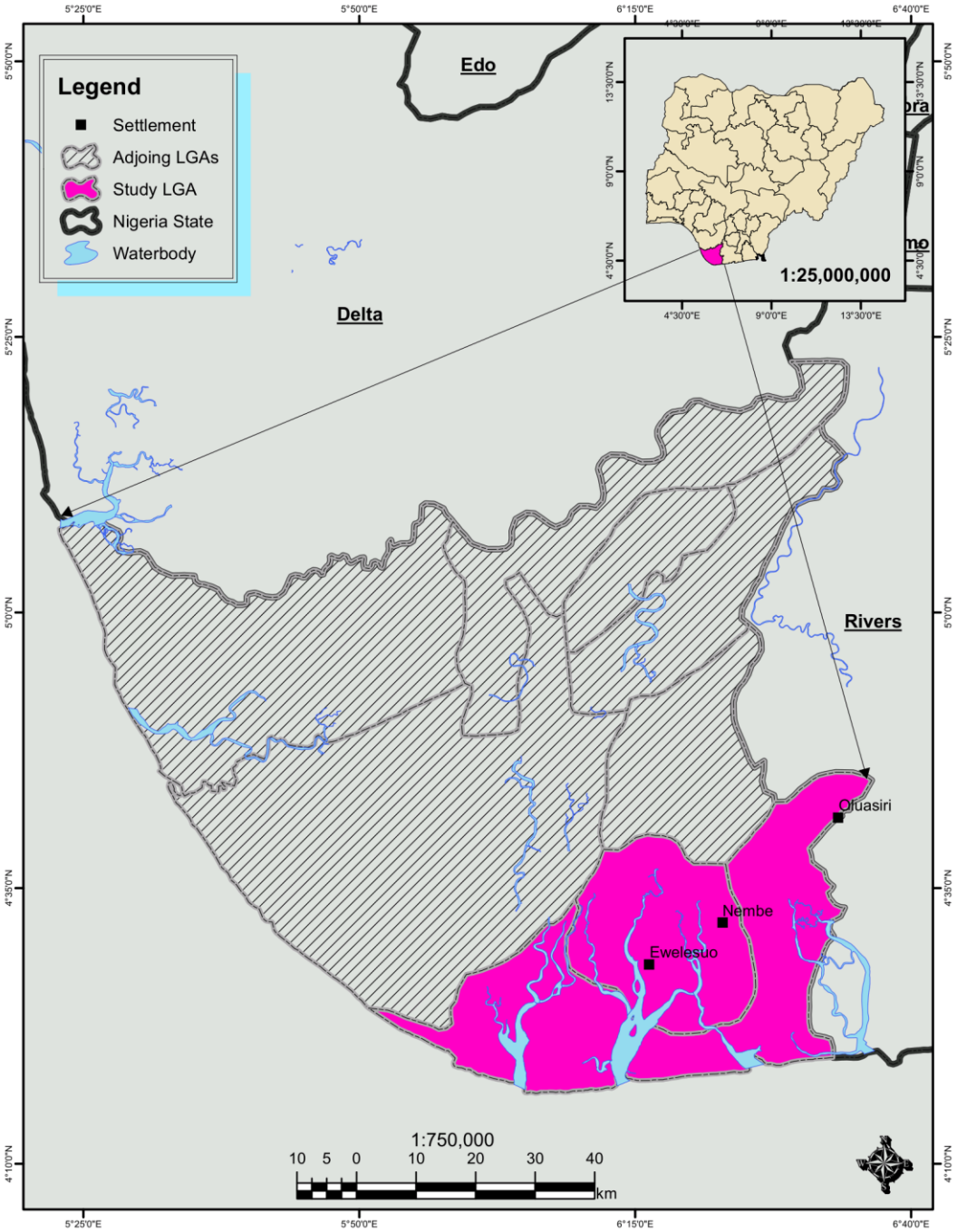


Figure 1: Map of the Study Area

Oil Spillage in the Niger Delta: Scope and Persistence

Oil spillage has remained a major environmental menace in Nigeria since 1956, when crude oil was discovered in Oloibiri, and it has been a very disastrous problem which has continued to ravage the Niger Delta region. Research indicates that thousands of oil spill cases have been experienced in the region, with various water bodies contaminated,

productive lands ruined, and the health of both man and the environment jeopardised (UNEP, 2011). Since 2006, over 13,000 cases of oil spillages have been recorded by the National Oil Spill Detection and Response Agency (NOSDRA), with most of them being in Bayelsa state, particularly in the Nembe Creek Trunk Line (NOSDRA, 2025). Although in many cases, shopping sprees and oil theft are blamed, studies have revealed that corrosion, old and poorly maintained pipelines and poor operations also play a major role in such occurrences (Amnesty International, 2016; Olalekan *et al*., 2020). The pollution that ensues results in deterioration of the mangrove forests, contamination of drinking water sources, and bioaccumulation of heavy metals in the sea organisms, which the locals consume (Nduka & Orisakwe, 2010). These effects of constant exposure extend to rampant implications on the food security, health, and socio-economic grounds of affected zones, including Ewelesuo, Nembe Creek, and Oluasiri.

Community Risk Perception of Environmental Hazards

One of the most significant aspects in the development of environmental response behaviours is risk perception, which refers to the subjective assessment of individuals concerning the possibility and severity of a risk (Slovic, 1987). People in the oil-producing communities usually regard oil spills in terms of health, income loss, and cultural erosion (Obida *et al*., 2018). We cannot always assume perception to be linearly correlated to technical risk interpretations. However, they depend on past experiences, trust in authority, socio-cultural discourses, as well as the visibility of effects (Kasperson *et al*., 2005). The excessive focus on the threat to the environment in the Niger Delta can be attributed to the decades of neglect, the unmet promises to clean up their act, and the lack of representation in the decision-making, mostly experienced by communities there (Okonta & Douglas, 2001; Akpomuvie, 2011; Isa ngadighi & Ukudo, 2025). These dimensions make up some kind of a toxic realism where the people will come to understand environmental harm as an inevitability, and the official mechanisms of response are not seen as adequate, or politically controlled (Watts, 2008). Such a subjective outlook of injustice and vulnerability may give rise to resistance and advocacy or cause apathy and the feeling of despair, depending on contextual factors like education, economic opportunities, and even community solidarity (Ite *et al*., 2013).

Adaptive Strategies in Environmental Disaster Contexts

This is some form of adaptation consisting of behavioural adaptations, structural adaptations, as well as institutional adaptations towards stressors, borne of the need to minimise vulnerability and build resiliency (Folke *et al*., 2002; Isangadighi & Udeh, 2023). When state capacity with regard to institutional support is low or even delayed, as in the case of the Niger Delta, local populations are forced to come up with their own coping strategies. Those consist of diversification of livelihood, and utilisation of

traditional ecological knowledge (TEK) in informal remediation (e.g., herbs such as Eupatorium odoratum are utilised in detoxification), community-based environmental surveillance systems (Oviasuyi & Uwadiae, 2010; Leach *et al*., 2010). Case studies have reported incidences of communities developing their informal warning systems, locally based conflict resolution panels, and even communal action plans to contain spill extension prior to the official responses coming in (Obida *et al*., 2018; Nriagu *et al*., 2016). Such reaction, even though it is frequently not recognised in the formal response systems, are essential parts of community resilience. Such adaptations are influenced by a variety of factors, among which the social and disaster experience capital and the internal leadership relationships stand out (Olsson *et al*., 2004).

Gaps in Literature and Theoretical Framing

As much as the study has an expressed volume of research concerning the environment in the Niger delta, there is a discerned discrepancy in the relationship of how the communities would experience and respond to the chronicity of oil spill threats. The literature is slanted towards the environmental and toxicology aspects of oil spills (Nduka & Orisakwe, 2010; Olalekan *et al*., 2020), but not much to the social-cognitive and behaviour component of the community response. Besides, they overlook the fact that local knowledge frameworks and perception-based early warning indicators are rarely integrated into the planning of environmental risks by existing frameworks of policy formulation. This paper shall fill that gap by two complementary theoretical approaches, which are Risk Perception Theory and the Social-Ecological Resilience Framework. The Risk Perception Theory (Slovic, 1987) makes it possible to scrutinise a subjective evaluation of environmental risks by individuals and communities with respect to cognitive, emotional, and cultural motivations. The Social-Ecological Resilience Framework (Folke *et al*., 2002; Berkes & Ross, 2013) has supplied a template of community response to experiencing environmental disturbance in terms of adaptation, shock-absorbing and reorganising.

Research Methodology

In this study, a convergent mixed method was used to conduct a systematic study of how the population perceives and reacts adaptively to recurrent oil spills in Ewelesuo, Nembe Creek and Oluasiri communities of Bayelsa State in Nigeria. To give a fair representation based on gender, age categories, and occupation, a multi-stage stratified sampling method was used in the determination of the communities selected. A quantitative study quantified a structured and pre-validated research instrument, with 68 closed-ended questions was used to collect data on socio-demographics, levels of environmental exposure, risk perception, coping patterns, institutional trust, and vulnerability of the socio-ecosystem on 387 respondents. The sample was then described with the help of descriptive statistics

(means, frequencies, and percentages). Spearman rank correlation was used as inferential analysis to test the correlation between perceived risk and adaptive behaviour, logistic regression models were done to determine the predictors of adaptive response, and ANOVA was used to determine the difference in perception scores between communities. The Principal Component Analysis (PCA) was also done to simplify the multidimensionality and isolate such latent variables as institutional distrust, perceived severity, and resilience capacity. The cluster analysis was used to cluster. Much of the literature is in the environmental and toxicological aspects related to oil spills (Nduka & Orisakwe, 2010; Olalekan *et al*., 2020), and little is done on socio-cognitive and behavioural aspects of community response. Additionally, when implementing the policy frameworks, the local knowledge systems and the indicators of early warning signs, which are derived through perception, have not been considered in their planning for environmental risks. In this paper, the author attempts to fill in the gap and combine two theories that are favourable to each other: Risk Perception Theory and the Social-Ecological Resilience Framework.

The Risk Perception Theory (Slovic, 1987) is a means through which individuals and communities analyse the subjective evaluation of environmental threats about cognitive, emotional, and culturally intervening factors. A model of how communities adjust, withstand shocks, and restructure themselves in response to environmental change can be found in the Social-Ecological Resilience Framework of Folke *et al*. (2002), Berkes & Ross (2013) and Islam et al (2025). The study employed a triangulation matrix to cross-validate the results between the quantitative and qualitative data sets, thereby contributing to the internal validity and depth of interpretation. The research ethics committee of Bayelsa State granted ethical approval, and all participants gave informed consent. The duration of fieldwork was six weeks, which made it possible to conduct the process in an iterative manner and real-time contextual verification, as well as asking culturally sensitive questions. A combination of these frameworks permits a multi-axial assessment of the oil spill phenomenon, not only as it is, say, an ecological crisis but as a socio-environmental problem which demands a convergence of technicals, local agency, and policy change.

Results and Interpretation

Table 1: Socio-demographic Profile of Respondents

Variable	Categories	Frequency (n)	Percentage (%)
Gender	Male	218	56.3
	Female	169	43.7
Age Group (Years)	18–30	92	23.8
	31–45	144	37.2
	46–60	108	27.9
	Above 60	43	11.1

Education Level	No formal education	67	17.3
	Primary	103	26.6
	Secondary	142	36.7
	Tertiary	75	19.4
Occupation	Fishing	184	47.5
	Farming	96	24.8
	Trading	69	17.8
	Civil/Public Service	38	9.8
Community	Ewelesuo	129	33.3
	Nembe Creek	127	32.8
	Oluasiri	131	33.9

Interpretation: Fishers and farmers formed a good majority of the questionnaires, and it is an indication that people had a strong dependency on the aquatic and terrestrial ecosystems as a source of livelihood. There is also the moderate literacy indicator in the educational profile that may determine how risk is perceived and responded to.

Table 2: Awareness and Risk Perception among Respondents

Statement	**Strongly Agree (%)**	**Agree (%)**	**Neutral (%)**	**Disagree (%)**	**Strongly Disagree (%)**
Oil spills occur frequently in my community	58.1	27.6	6.2	5.9	2.2
Oil spills have affected my family's livelihood	63.7	21.5	5.4	6.2	3.1
The government responds swiftly to oil spills	4.4	8.5	17.1	35.9	34.1
I believe oil companies are responsible for environmental repair	49.9	29.2	10.3	6.5	4.1

Interpretation: People have considerable consciousness of frequent cases of oil spills, and there is wide agreement on livelihood disruption. It is interesting to see that the level of trust in government responsiveness is very low, which indicates institutional gaps.

Table 3: Community-Level Adaptive Strategies

Strategy Implemented	**Ewelesuo (%)**	**Nembe Creek (%)**	**Oluasiri (%)**	**Overall (%)**
Temporary migration during the spill	24.8	27.4	22.1	24.8
Fishing in safer zones	61.2	64.1	58.3	61.2
Storage of clean water	77.5	81.7	74.0	77.8
Community cleanup efforts	18.6	23.7	21.3	21.2
Avoiding crop farming for a period	42.3	38.2	35.4	38.6

Interpretation: The majority of respondents have to depend on short-term or conventional mitigation strategies such as migrating, moving to different fishing places, or water storage. Such is responsive and the evidence of a lack of institutionalised support for adaptation.

Table 4: PCA Component Loadings for Adaptive Strategies

Adaptive Strategy	Component 1 (Community-led)	Component 2 (Individual-level)
Temporary migration	0.512	0.721
Fishing in safer zones	0.798	0.412
Storing clean water	0.432	0.805
Community cleanup	0.856	0.322
Avoiding crop farming	0.677	0.451

Interpretation: Indeed, the two robust factors of adaptation revealed by PCA are (1) collective responses (community-level) and (2) survivalist adjustments (individual-level). These revelations are utilised to recommend certain resilience measures.

Table 5: Pearson Correlation Coefficients

Variable Pair	Correlation (r)	Significance (p-value)
Perceived Spill Frequency × Livelihood Shift	0.614	0.001
Risk Perception × Clean Water Storage	0.473	0.003
Trust in Govt Response × Community Cleanup	–0.284	0.017

Interpretation: Risk adaptation and perception have a good positive connection. Interestingly enough, distrust in the government is related adversely to mass clean-up activities.

Table 6: K-Means Cluster Grouping (K=3)

Cluster	Description	Dominant Community	Key Feature
1	Proactive Adaptation Cluster	Nembe Creek	High livelihood adjustment rate
2	Passive/Waiting Cluster	Oluasiri	Delayed action, low cleanup
3	Resource Scarcity Cluster	Ewelesuo	High water storage, low farming

Interpretation: Ewelesuo scale shows resources-based responsiveness, Nembe Creek scale indicates more dynamism of adaptation, and Oluasiri scale shows very poor manifestations of institutional or proactive action offerings.

Table 8a: Chi-Square Test of Association between Gender and Perceived Risk Level

Gender	High	Moderate	Low	Total
Male	62	63	67	192
Female	67	62	66	195
Total	129	125	133	387

$\chi^2 = 1.43$, $p = 0.49$

Table 8b: Chi-Square Test of Association between Education Level and Willingness to Adopt Safety Protocols

Education Level	Yes	No	Total
Primary	75	58	133
Secondary	70	64	134
Tertiary	61	59	120
Total	206	181	387

$\chi^2(2) = 2.02$, $p = 0.36$ (not significant)

Interpretation: Willingness to adopt safety protocols does not significantly differ across educational levels.

Table 9: Kruskal–Wallis Test of Perceived Health Risk Across Education Levels

Education Level	Mean Rank of Risk Perception
Primary	189.3
Secondary	201.6
Tertiary	194.1

Kruskal–Wallis H = 1.66, $p = 0.435$

Interpretation: No significant difference in perceived health risk across education levels.

Table 10: Factor Loadings for Perception and Attitude Statements (Exploratory Factor Analysis)

Questionnaire Items	Personal Risk Perception	Avoidance Behaviour
An unsafe environment causes illness	0.208	0.155
Poor sanitation is a major problem	-0.344	-0.251
I feel exposed to danger	0.788	-0.181
I worry about accidents at the park	0.020	0.114
I avoid the park when it is crowded	-0.091	-0.717

Table 11: Logistic Regression Predicting Willingness to Report Sanitation Issues

Variable	Coefficient (B)	Std. Error	z-value	*p*-value	95% CI (Lower, Upper)
Constant	0.215	0.425	0.506	0.613	-0.618, 1.048
Gender (Male=1)	0.158	0.204	0.774	0.439	-0.242, 0.559
Age (years)	-0.007	0.007	-0.941	0.347	-0.021, 0.007
Perceived Risk Score	0.059	0.124	0.474	0.636	-0.185, 0.303

Interpretation: All the predictors was not significant. Gender, age, or perceived risk score did not have meaningful significance in terms of their ability to explain willingness to report sanitation issues.

Table 12: Summary of Key Informant Interview (KII) Responses on Community Perception and Adaptive Response to Oil Spills

KII Code	Respondent Description	Key Issues Raised	Perception of Spill Cause	Perceived Impact Severity	Proposed Solutions
KII01	Community Youth Leader – Ewelesuo	Youth anger, migration, and reduced trust in government	Pipeline vandalism, poor maintenance	Very Severe	Youth employment, local surveillance
KII02	Traditional Ruler – Nembe Creek	Loss of ancestral lands, declining fishing rights	Government neglect, sabotage	Extremely Severe	Legal reforms, host community equity
KII03	Environmental Officer – LGA Level	Ecological loss, contaminated mangroves	Ageing pipelines, poor enforcement	Severe	Independent monitoring units
KII04	Primary Healthcare Worker – Oluasiri	Skin diseases, miscarriages, and high respiratory issues	Crude exposure, contaminated water	Critical	Mobile clinics, health surveillance
KII05	Women's Leader – Ewelesuo	Psychological trauma, food insecurity	Oil company negligence	Severe	Compensation, female-led advocacy
KII06	Fisherman – Nembe Creek	Loss of livelihood, indebtedness	Oil spillage and water pollution	Extremely Severe	Restoration of creeks, fishing support
KII07	NGO Representative – Yenagoa	Weak policy implementation, elite capture	Structural governance failure	Severe	Policy overhaul, community inclusion
KII08	Local Government Chairperson	Conflict between security forces and locals	Economic desperation, pipeline access	Severe	Development pacts, accountability mechanisms

Table 13: Thematic Matrix Linking KII Responses to Study Objectives

Study Objective	Emerging Themes from KII	KII Sources	Interpretation
To examine the perceived environmental impacts of oil spillage	- Contamination of water and mangrove ecosystems - Biodiversity loss - Land degradation	KII03 (Environmental Officer), KII06 (Fisherman), KII02 (Traditional Ruler)	Oil spills have led to significant ecological deterioration, limiting land productivity and aquatic life sustainability.
To assess the socioeconomic consequences on local livelihoods	- Loss of fishing and farming income - Food insecurity - Rural-urban migration - Unemployment	KII01 (Youth Leader), KII06 (Fisherman), KII05 (Women's Leader)	Oil spills cripple economic stability by destroying traditional means of livelihood, worsening poverty and dependence.
To explore community perceptions on the root causes of oil spills	- Pipeline vandalism and poor maintenance - Government and corporate neglect - Weak institutional oversight	KII02 (Traditional Ruler), KII03 (Environmental Officer), KII07 (NGO Rep)	Perceptions suggest both internal sabotage and external negligence are equally blamed for recurring spills.
To evaluate the health and psychological effects on residents	- Skin infections, respiratory distress, miscarriages - Mental stress, hopelessness - Drug dependence	KII04 (Health Worker), KII05 (Women's Leader), KII01 (Youth Leader)	Recurrent oil spills have translated into chronic health issues and emotional exhaustion, particularly among vulnerable groups.
To identify adaptive strategies and proposed community-based solutions	- Community policing of pipelines - Youth employment - Legal reforms and compensation - Mobile clinics and NGO partnerships	KII08 (Chairperson), KII01 (Youth Leader), KII04 (Health Worker), KII07 (NGO Rep)	Community stakeholders recommend both institutional and grassroots responses to restore trust and resilience.

Table 14: Summary of Emerging Themes from FGD

Theme	Description	Supporting Quotes	Implication
Perceived Negligence by Oil Firms	Community members strongly believe oil firms downplay the frequency and severity of spills.	"They come after a week or two... when the oil has already spread and destroyed everything."	Indicates distrust and poor emergency response coordination.
Loss of Livelihood	Participants reported a severe impact on farming and fishing due to oil contamination.	"Even the cassava we plant now does not grow well again."	Highlights environmental degradation and growing food insecurity.
Health Concerns	Residents expressed worry over persistent skin irritation, cough, and strange illnesses among children.	"Our children are always falling sick. The doctor said it might be because of the river water."	Emphasises public health risks from contaminated water and soil.
Ineffective Compensation Mechanisms	Participants described compensations as inconsistent, politicised, or non-existent.	"Only those close to the chiefs or politicians get anything."	Suggests exclusion, injustice, and lack of transparency in redress systems.
Traditional Knowledge & Adaptation	Communities reported indigenous coping strategies—e.g., filtering polluted water with charcoal and seasonal migration for fishing.	"We now filter our water using cloth and charcoal. At least it reduces the smell."	Reveals grassroots innovation and underscores the need for formal integration of local wisdom.

Table 15: Frequency of Theme Occurrence Across FGDs

Community	FGD Group	Negligence by Oil Firms	Livelihood Loss	Health Concerns	Poor Compensation	Traditional Adaptation
Ewelesuo	FGD 1	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓✓	✓✓✓
Ewelesuo	FGD 2	✓✓✓	✓✓✓✓	✓✓	✓✓	✓✓✓✓
Nembe Creek	FGD 3	✓✓✓✓	✓✓✓✓	✓✓✓✓	✓✓✓	✓✓
Nembe Creek	FGD 4	✓✓✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Oluasiri	FGD 5	✓✓✓✓	✓✓✓	✓✓✓✓	✓✓✓✓	✓✓✓✓
Oluasiri	FGD 6	✓✓✓✓	✓✓✓✓	✓✓✓	✓✓✓	✓✓✓

✓ = minor mention, ✓✓ = moderate mention, ✓✓✓ = major theme, ✓✓✓✓ = dominant concern

Interpretation: FGD findings are graphically augmented in the context of the quantitative results with respect to high-risk perception, distrust of oil firms, and socio-ecological vulnerability. Moreover, there is the occurrence of traditional coping strategies, which demonstrate community resiliency, but are undermined by the dysfunctional parts of the system and insufficient compensation. The combination of threat, effect, and control is clever and feasible because it is a survival story that represents environmental oppression.

Discussion

Demographic Realities and Risk Anchoring

In Table 1, it was shown that they were mostly male (56.3%), were in the productive ages of 31-60 years (65.1%), and were mostly occupied in fishing and farming (72.3%). Although 83% of them possessed some form of education at least up to primary, their tertiary education was only 19.4%. These demographies informed what is usually defined as the perceptions and reactions of such persons or groups to environmental shocks. Environmental awareness and adaptation are increased through education, as Olalekan *et al*. (2020) reiterate. However, Table 8b indicated that there was no statistically significant relationship between accomplished education and attitude willingness to implement safety protocols (2.02, 0.36), which points out that environmental decision-making in this regard might be based more on experience than education. This is contrary to (Nriagu *et al*., 2016), who concluded that formal education was a significant predictor of environmental health behaviour in the Niger Delta.

Heightened Risk Perception and Institutional Distrust

Table 2 data indicated that there was a high level of agreement (85.7%) that oil spills are everyday and cause disruption to livelihoods. In the meantime, the percentage of those who believed the government responds quickly to oil spills was not significant enough to split the difference, at only 12.9%. The results are also supported by the fact that the factor of trust in government is negatively correlated with the community-led cleanup in Table 5 ($r = -0.284$, $p = 0.017$), which means that the institutional mistrust could impede collective action. This is in sync with (Ochoche, S., & Ajumobi, 2023), who explained that the inability of governments to uphold consistent spill control, as well as their inertness, is also a major contributor to the lack of community enthusiasm in the process. The trend is an indication of a psychosocial disempowerment that works against participatory resilience.

Adaptive Strategies: Survivalist and Collective Orientations

Storage of clean water (77.8%) and fishing at safer areas (61.2) were levels of dominance strategies as will be explicated in Table 3. The respondents who had engaged in organised

cleanups were also lower (21.2%). Table 4 indicates that the PCA extracted two large dimensions, specifically, Component 1 (community-led action) and Component 2 (individual-level survivalism). These results resonate with (Adams *et al*., 2019), who identified the coping strategies of the Niger Delta communities as informal adjustments and emergent collectives. This was further narrowed down by cluster analysis (Table 6), using which Nembe Creek was pegged as the most proactive (Cluster 1), Ewelesuo was resource-adaptive (Cluster 3), and Oluasiri was large-scale passive (Cluster 2). Spatial heterogeneity of the adaptive agency may indicate availability of NGO assistance, availability of local leadership and /or experience of previous intervention, a similar trend that we see in (UNEP, 2011) in the case of Ogoniland.

Statistical Significance and Sociological Inference

Irrespective of the assumptions made on the demographics, the Chi-square tests in Tables 8a and 8b revealed no significant association between gender and education and the risk perception and safe adoption. As well, the Kruskal-Wallis Test (Table 9) indicated that there was no educational effect in the perceived health risk ($H = 1.66$, $p = 0.435$). Such findings are indicative of a homogenised risk reality that may transcend demographic boundaries, which was also recorded by Agho *et al*. (2019), in the case of flood disaster in southern Nigeria. On the contrary, Table 5 revealed that there is a significant relationship between perceived spill frequency and livelihood shift ($r = 0.614$, $p = 0.001$) and between risk perception and clean water storage ($r = 0.473$, $p = 0.003$). These take into account the Protection Motivation Theory (PMT), which envisions that perceived severity boosts precautionary moves.

Behavioural Determinants: A Logistic Paradox

Logistic regression (Table 11) showed that the gender, age, his/her perception score, and his/her risk perception did not show a significant relationship with his/her willingness to report sanitation or oil spill havoc ($p > 0.05$, in all cases). This apparently paradoxical result underscores a behavioural dead end, which could be anchored in an apprehension of penalty, political estrangement, or a structural disillusion. It is inconsistent with (Eker *et al*., 2021), which was found to be accurate in showing that risk perception frequently forecasts reporting behaviour in high-trust settings. The lack of meaning in this case can be representative of worn-down civic confidence.

Thematic Patterns in FGD and KII Results

The qualitative information obtained through Focus Group Discussions (FGD) and Key-Informant Interview (KII) gave detailed contextual information to ensure completion of gaps in the statistical trend of the quantitative survey. Six FGDs and eight KIIs were carried out in Ewelesuo, Nembe Creek, and Oluasiri with the participation of the local

leaders, youth representatives, women association members, fishermen, healthcare workers, and NGO staff. The interviews exposed a multisided, affective and historically institutionally held meaning of oil spillage in the area with a disillusionment of the community, institutional betrayal and grassroots vitality. Both the irresponsibility of oil companies and governmental agencies have become one of the main messages in all FGDs. Respondents reported that response crews regularly took days or even weeks before they would reach an oil spill site, after which the pollution had already ruined a farm and contaminated the rivers. In both Ewelesuo and Oluasiri, this has been one common story, although one of the participants expressed pain by saying, they only come when the media is around, and they go away without clearing anything. Not only did this stagnation in remediation increase the level of ecological degradation, but it also created a great distrust. KIIs with the environmental officers and local government officials verified the use of obsolete pipes. They accepted that the implementation of regulations was poor, since this could be supported through political influence and a shortage of funds. The results support the earlier claims by Oviasuyi and Uwadiae (2010) who have reported the structural complicity of both corporate agents and the regulators in causing structural complicity in fostering environmental injustice in oil-producing regions.

The second theme of critical importance was livelihood loss, where FGDs explained how both of these ventures had turned unsustainable. Fishers were talking about diminished fish stocks and creek contamination in Nembe Creek, and poor cassava yields and soil pollution were the complaints among women in Ewelesuo. We put a net in dem are five or six fishermen in the creek. We put a net in them and either. The dark water is gone, and there are no ectothermic fish. KIIs supported such fears with traditional rulers and leaders of the youth that the high number of male youths had moved to the city with hopes of jobs that never existed and leaving the present ageing and fragmented labour force. These observations reiterate the fact that UNEP (2011) and Agho *et al*. (2019) had previously reported the socioecologically induced displacement worldwide due to the recurrent oil pollution in the Niger Delta. The other theme was health issues. In both Oluasiri and Ewelesuo, residents attributed more skin irritations, miscarriages, respiratory sicknesses, and morbidity in children. One of the recorded primary healthcare workers in Oluasiri had reported that there was an increase in the occurrence of water-borne diseases and attributable the cause of water-related diseases to oil-contaminated water sources. She indicated that we deal with rashes and coughs, day in and day out, yet, no clean water, and it is an uphill battle. These health-related disadvantages were not quantified in the quantitative modelling, but the recurrence of these health disadvantages in all qualitative sources highlights an under-documented public health emergency. The structural neglect is also supported by being perceived as lacking in terms of long-term health surveillance systems. This coincides with the findings of Nriagu *et al*. (2016), who indicated that there

are similar health complications with oil-affected communities and emphasised the health measures to intervene according to the region.

Its fourth theme was the incapability of the compensation and redress systems. Respondents in the three neighbourhoods depicted the idea of compensation to be vague and masked, unfriendly, and accompanied by favouritism. According to youth leaders and women's associations, it was only those with political or traditional affiliations who were getting paid or relieved in any way. According to one participant of the FGD, only the family of the chief and the politicians receive something. The KIIs with the representatives of NGOs and local governments recognised this fact, as the compensation did not always end up reaching the worst-hit homes. Such viewpoints are consistent with the findings of Hossain *et al*. (2024), who underscored the politicisation of the redress system as one of the most important causes of people's dissatisfaction and civil unrest within the community. Along with the gloominess of the situation, evidence of local reform and traditional coping measures was also found through FGDs and KIIs. A description of how residents used charcoal, cloth filtration and boiled water to clean the contaminated drinking water was given in all three communities. Some accounted for their responses by seasonally migrating to other non-polluted areas to fish or cultivate crops, and a few formed some form of guard outfits to keep a watch over pipelines. One of the senior Oluasiri members said, “we can now use clothes and charcoal to filter the water; it is not that perfect, but it minimises the stench.” Despite being primitive, they represent the efforts of the agency and perseverance of these communities in situations when they do not have the structure to keep them together. KIIs observed that these indigenous strategies are mostly not supported by the governments or the oil companies despite their promise. The reactive, uncoordinated adaptation found at the Ogoni communities was also understated by Adams *et al*. (2019), who noted that incorporating local expertise into official environmental strategies is critical. The results of the qualitative data based on FGDs and KIIs identified a rather deep-rooted feeling of vulnerable state, mistrust and marginalisation. They, however, revealed a large but unrealised potential of local adaptability and the solution of problems. The themes confirm survey results and give a new dimension, feeling, and historical awareness to the quantitative story. The consequences of the same point out the importance of pursuing a devolutionary, integrated-system, justice-based approach towards management of the environment in oil-impacted communities.

Summary of Cross-Cutting Observations

The synthesised survey research, focus group discussions (FGDs), and key informant interviews (KIIs) are offered in this study that reveals the multidimensional account of environmental degradation, socioeconomic distress, behavioural adjustment, and government malfunction on the oil-bearing communities of Ewelesuo, Nembe Creek and

Oluasiri, Bayelsa State. The results indicate that despite the strong perception of environmental risk that the communities have created, the adaptive capacity is limited by failures within the institutions and scarce ability to access structured mechanisms of support. The visual presence of the recognition of the degradation of the environment due to chronic oil spills is the most common theme observed when all the data were cross-referenced. Quantitative and qualitative evidence merge to state that oil spills have caused serious pollution of water sources, ruination of arable land and loss of biological diversity-thus compromising the ecological base where local communities rely as their only means of livelihood. This corruption has instigated a radical change in the occupational sojourns. The predominant economic activities, fishing and farming, which used to remain dominant, have not been sustainable with pollution and soil toxicity, as revealed in the results. The communities are being compelled to use other and more vulnerable survival strategies, such as petty trading, craft production of raw materials, and seasonal migration. This goes in line with prior studies that have discussed oil-related pollution and its effects on long-term environmental fitness and socioeconomic displacement of people in the Niger Delta by UNEP (2011) and Nriagu *et al*. (2016).

In addition, the problem of institutional mistrust became a sociopolitical leitmotif. More than three-quarters of the respondents who took part in the quantitative survey have rated the response of the government and companies on issues of oil spills as poor. This feeling has been repeated during FGDs and KIIs, in which it has been common to hear the oil corporations described as unanswerable and state actors, where they can be characterised as parties involved or uncaring. It would be impossible to say that such perceptions are merely emotional, but a matter of lived experience, to use the terms of interventions that have come too late to be effective, remediation that did not work, and exclusionary systems of compensation. All this mistrust subsumes civic trust and cuts dependence on collaborating with the management of environmental activities. The lack of coordinated and transparent accountable institutions in resource-rich societies usually causes policy alienation, grassroots apoliticism, and social and political instability, even as it is observed in instances documented by Oviasuyi and Uwadiae (2010). The other prominent cross-cutting observation is that adaptive strategies are reactive and uneven. Even though the majority of the communal members have come up with self-help or home-level solutions for dealing with the pollution, using rainwater storage, transferring their fishing, or filtering drinking water with cloth and charcoal, the response is disjointed and limited. The clustering and PCA indicated that communities had a great variation in terms of the level of adaptive response, with Nembe Creek being associated with better organisation and proactive adaptation, whereas Oluasiri was associated with passive adaptation. Such disparity is a characteristic of certain inherent differences in the potential social capital, the potential external aid (e.g., NGOs), and the self-efficacy of leadership. In the way Adams and his colleagues (2019) argue in their research on adaptation in flood-prone

Niger Delta communities, dependability of local resilience greatly relies on integration of indigenous knowledge and institutional capacity and resources-which is the case in study areas, to a great extent.

Most striking perhaps is the psychosocial consequences of the environmental degradation, an aspect that is usually poorly explored in the ecological impact assessment. In both FGD and KII stories, all three communities highlighted increased cases of stress, fear, and anxiety. Supplemented by women groups, reproductive health issues and low birthweight, and those of healthcare works, were chronic skin diseases, respiratory infections, and unidentified ailments that might be attributed to the effect of exposure to hydrocarbons. Although these challenges could not be quantitatively extrapolated in the quantitative part, they create a pattern evident in the qualitative section, which indicates that they are an unaddressed public health emergency. This result is in line with Nriagu *et al*. (2016) and Agho *et al*. (2019), who in a broader view highlighted the syndemic of interactivity between environmental catastrophes and the add-on of mental/physical health burden in vulnerable communities. Last but not least, the disparity between risk perception and reporting behaviour is identified as shown in the logistic regression analysis, which should be critically addressed. Regardless of the low level of awareness on environmental risks, the data exhibited no statistically significant predictors of willingness to report oil spill incidences or sanitation risks, by gender, education level or age. This observation implies that individual demographic factors may not be key determinants of sexual violence support in some cases due to underlying structural and contextual obstacles like fear of retaliation, cultural norms or a record of unresponsiveness. It makes the commonly held belief that an increased perception of risk, which naturally produces responsible environmental behaviour, as presented in Protection Motivation Theory (PMT), fall into place much harder. Rather, the results are similar to those reached by Eker *et al*. (2021), who said that the sociopolitical environment should be taken into account when such behavioural outcomes occur in disaster-prone areas.

Finally, through this research, it can be seen that, albeit acutely aware of their ecological livelihoods, and resilient in a time of tribulation, the potential of their capacity to adjust and more sustainably respond is greatly diminished by institutional refractoriness, environmental injustice and a lack of institutional organisation.

Conclusion

In this paper, the perception and adaptive reactions of the community were critically analysed through frequent oil spills in the Ewelesuo, Nembe Creek, and Oluasiri communities in the Nembe Local Government Area of Bayelsa State in Nigeria. A rigorous mixed-methods study, combining descriptive statistics, multivariate analyses, FGD, and KIIs, revealed that the environmental crisis under study is deeply entrenched, with extensive ecological, socioeconomic, and psychosocial impacts. The results

demonstrated that oil spills have devastated the land and the water system, and the basis of the livelihood of natives, and this has resulted in lower agricultural production, destroyed fisheries, and decentralisation of traditional occupations. More importantly, communities exhibit high levels of awareness as well as financial and personal handicapping measures. However, the resilience is damaged by institutional indifference, closed systems of compensation, and a lack of adequate or lasting infrastructural or medical care efforts.

The quantitative analyses indicated that there was a significant correlation between perceived risk and adaptive behaviours, but the logistic regressions were not occasion when the demographic considerations like gender, age or education made any significant difference in predicting the willingness to report hazardous conditions within an environment. The implication is that there are structural inhibitors to the extent that even in the face of acute threat, civic engagement is still textured by fear, political disillusionment, or social disempowerment. These trends were assisted by qualitative stories that introduced emotional and historical depth to the problem, which show how deep-rooted mistrust towards oil industries and government institutions is. In general, this study confirms the fact that the oil spill crisis in Nembe is not only an ecological but also a political and psychological issue. It entails a revamped way of thinking about the arrangement of oil-based environmental government and the location of communities not as victims, but as positive main agenda makers with understanding, and entitled to environmental justice.

Recommendations

The works are founded on the findings that a package of context-specific and strategic recommendations aiming at promoting environmental governance, community well-being, and community health in populations exposed to oil spills is suggested. To start with, it is dire that community-based environmental surveillance systems are put in place with real-time reporting capabilities and a legal status. This would be through such structures organised to work in coordination with local governments and the society, which would allow quicker detection and response to oil spill incidents, thereby eradicating ecological damage and creating local trust. Second, processes of compensation need to be transparent and inclusive and equitable. This would include an independent commission of inquiry on compensation comprising community leaders, environmental non-governmental organisations, and legal professionals and accessibility to beneficiary lists and procedures of redress to the population.

Third, there should be an enhancement of health infrastructure within the spill-affected regions, specifically by providing mobile clinics, long-term epidemiological monitoring, and education on the health risks based on awareness of the local exposure conditions. Environmental interventions have to be enshrined in public health policies since the

impact of oil pollution is both ecological and medical. Fourth, oil corporations will be obligated, first through legislative adjustments and secondly through regulatory sanctions, to fund long-term community growth agreements. These agreements would entail sustainable livelihood schemes, water supply, and capacity building for youth and women. Lastly, researchers, NGOs, and development partners must collaborate with local actors to ensure that indigenous knowledge is integrated into formal environmental planning. This integration requires adaptation strategies that are locally based, technically feasible, and culturally suitable. The ingrained effects of oil-related ecological degradation of the Nembe environment and beyond cannot be transcended except there is a participatory, rights-based and multi-sectoral approach to reversing it.

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