

Crude Oil Theft and Environmental Degradation in Oil-Producing Communities of Rivers State, Nigeria: Evidence from Bodo And Rumuekpe

Ihunwo, Queen Grace

Email: ihunwo.queengrace@rsu.edu.ng
phone no:07065394821

Prof. Emmanuel B. Okemini

Email: Emmanuel.okemini@rsu.edu.ng

Phone no: 08037088813

Department of Sociology,

Faculty of Social Sciences,

Rivers State University, Nkpolu-Oroworukwo,

Port Harcourt, Nigeria

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Abstract

This study examines crude oil theft as a direct driver of environmental degradation in Bodo (Gokana LGA) and Rumuekpe (Emuoha LGA), two oil-producing communities in Rivers State, Nigeria, using a descriptive survey design anchored on Strain Theory, Resource Curse Theory, and Environmental Justice Theory. Two communities were purposively selected for their contrasting exposure profiles; within them, 200 respondents were drawn through stratified random sampling across six occupational categories. Structured questionnaires were analysed using descriptive and inferential statistics (chi-square). Respondents perceived poverty and unemployment as the leading facilitators of oil theft and associated the practice with widespread air, water, and soil pollution, which in turn undermined farming, fishing, and health. Government enforcement, corporate remediation, and compensation were perceived as slow, profit-driven, and inadequate, respectively. The findings support a theoretically grounded, mutually reinforcing relationship between environmental harm and continued oil theft, though the cross-sectional design cannot establish causal direction. The article recommends coordinated regulatory enforcement, logistics-chain surveillance, community-based environmental governance, and targeted youth economic empowerment.

Keywords: *crude oil theft, illegal bunkering, pipeline vandalism, environmental degradation, Resource Curse.*

Introduction

Crude oil has been the mainstay of Nigeria's economy since its discovery in commercial quantities at Oloibiri in 1956, driving the bulk of government revenue and foreign exchange earnings (Ite, Ibok, Ite, & Petters, 2013). The oil sector finances a substantial share of national infrastructure,

public expenditure, and economic growth. Yet the oil-producing communities of the Niger Delta, and Rivers State in particular, continue to bear the environmental and socio-economic costs of extraction without a commensurate share of the wealth it generates. Rivers State occupies a central position in Nigeria's oil industry because of its concentration of wells, flow stations, pipelines, refineries, and export terminals, which also makes it one of the areas most exposed to the ecological consequences of oil exploration. Over the past two decades, this paradox has been compounded by the growth of crude oil theft. Because the terms used in this literature are frequently conflated, this article defines them at the outset and uses them consistently throughout. Crude oil theft is used as the umbrella term for the unlawful appropriation of petroleum products from production and transport infrastructure. Within it, pipeline vandalism refers specifically to the physical breaching of pipelines to siphon crude; illegal bunkering refers to the unauthorised tapping and onward transport of crude or refined products, typically for resale; and artisanal refining refers to the downstream, unlicensed processing of stolen crude into fuel products in improvised bush refineries. These are related but analytically distinct activities, and the keyword "illegal bunkering" is used in this article as a component of crude oil theft rather than as a full synonym for it. Nigeria is estimated to lose between 100,000 and 400,000 barrels of crude oil daily to theft and pipeline vandalism, a wide range that itself reflects the absence of a single authoritative count; the widely cited 400,000 bpd figure originates in newspaper reporting (Nnodim, 2022, a Punch news report rather than a peer-reviewed or audited source) and should be read alongside independent institutional estimates. The Nigerian Extractive Industries Transparency Initiative separately put average daily losses at approximately 200,000 barrels (NEITI, 2021), and a 2023 National Assembly ad-hoc committee and successive NEITI industry audit reports have produced further, only partly overlapping, estimates. Read together, these sources agree on the order of magnitude losses running into billions of dollars annually without agreeing on a precise figure, and this uncertainty is itself evidence of the institutional loopholes in Nigeria's oil governance framework that this article is concerned with. Beyond the fiscal loss this represents, the practice has become one of the most consequential drivers of ecological destruction in the region. Artisanal refining, in particular, relies on open-air burning of crude in improvised ovens and pits, releasing soot, greenhouse gases, and toxic compounds such as polycyclic aromatic hydrocarbons, carbon monoxide, sulfur dioxide, and heavy metals into the surrounding air, soil, and water (Anejionu, Ahiamammunnah, & Nri-ezedi, 2015). Eyinla and Ukpo (2006) estimated that more than 60% of environmental pollution in the Niger Delta is linked to illegal oil operations and associated acts of sabotage, a figure that underscores the scale of the problem relative to pollution from licensed extraction activity. Although a substantial body of scholarship has examined oil pollution arising from exploration and production activities in the Niger Delta, comparatively little empirical attention has been paid to crude oil theft as a distinct and direct driver of environmental degradation at the community level, and much of the existing evidence is drawn from broad regional surveys rather than community-specific analysis. Existing community-level and regional studies also rarely distinguish, in their survey instruments, between environmental harm respondents attribute to theft-related activity and harm attributed to licensed exploration and production; this article shares that instrument-level limitation, discussed further in Sections 5 and 8, but addresses the community-specific gap by drawing on primary survey data from Bodo and Rumuekpe, two Rivers State communities with markedly different exposure profiles: Bodo, a riverine Ogoni fishing and farming community in Gokana Local Government Area repeatedly affected by major spills, including the 2008–2009 Shell pipeline ruptures documented by UNEP (2011) and Amnesty International (2018); and Rumuekpe, an inland community in Emuoha Local Government Area

hosting critical Trans Niger Pipeline infrastructure that connects upstream production to the Bonny Export Terminal.

Accordingly, this article addresses four research questions:

1. What do residents of Bodo and Rumuekpe identify as the primary facilitators of crude oil theft in their communities?
2. How do residents perceive the environmental impact of crude oil theft across air, water, soil, forest, and biodiversity domains?
3. What relationship do residents perceive between environmental degradation from oil theft and the disruption of household livelihoods, health, and migration?
4. How do residents evaluate government, oil-company, and institutional responses to oil-theft-related environmental harm, and what interventions do they prefer?

It is organised as follows. Section 2 sets out the theoretical framework, drawing on Strain Theory, the Resource Curse Theory, and Environmental Justice Theory. Section 3 reviews the conceptual literature on crude oil theft, its typologies, and its environmental and socio-economic consequences. Section 4 reviews prior empirical studies and identifies the gap this article addresses. Section 5 describes the methodology. Section 6 presents the findings. Section 7 discusses the findings in relation to theory and prior literature. Section 8 concludes with policy implications, limitations, and directions for future research.

Theoretical Framework

This study draws on three complementary theoretical perspectives, Strain Theory, the Resource Curse Theory, and Environmental Justice Theory to explain both the persistence of crude oil theft and the distribution of its environmental consequences in Rivers State. As discussed below, Strain Theory alone cannot account for the organisational and network dimensions of oil theft, the involvement of corrupt insiders, transport operators, and transnational syndicates and is therefore deliberately paired with the Resource Curse Theory, which is closer in substance to a rent-seeking and political-economy account of that organisational dimension, and with Environmental Justice Theory, which addresses the distributive dimension neither of the other two frameworks captures on its own.

Strain Theory (Robert K. Merton)

Robert K. Merton's Strain Theory holds that deviance emerges when a gap exists between culturally prescribed goals, such as economic success, and the legitimate means available to attain them (Merton, 1938). Merton identified five modes of individual adaptation to this gap: conformity (accepting both goals and means), innovation (accepting goals but rejecting legitimate means), ritualism (abandoning goals while adhering to means), retreatism (rejecting both), and rebellion (rejecting and actively seeking to replace both). Mapped onto the Niger Delta context, innovation and rebellion are the two modes most visible in this study's data and in the wider literature, while conformity, ritualism, and retreatism are comparatively invisible, not because they do not exist in these communities, but because a structured survey instrument built around facilitators of, and responses to, oil theft is not designed to capture non-participatory adaptations.

Innovation is the dominant mode: the widespread involvement of local youth, ex-militants, and in some cases security personnel in oil bunkering and pipeline vandalism can be read as pursuit of the culturally endorsed goal of economic advancement through illegitimate means, because legitimate channels are foreclosed to them (Merton, 1968; Siegel, 2018). Rebellion is the second

visible mode, and is invoked explicitly in Section 7 in relation to petro-violence and militant networks: rather than merely substituting illegitimate means for legitimate ones, militant actors reject the existing distribution of oil wealth itself and seek to replace it, which is why the Discussion treats militancy as analytically distinct from, if overlapping with, the survival-oriented bunkering that innovation explains. The theory is particularly apt for this study because it captures the circularity documented in the findings: environmental degradation destroys legitimate livelihood options such as farming and fishing, intensifying the very strain that sustains further oil theft. Addressing crude oil theft effectively, on this account, requires more than enforcement and criminalisation; it requires the Nigerian state to address the root causes of strain by ensuring more equitable distribution of oil wealth, strengthening institutional legitimacy, and providing sustainable development opportunities in affected communities.

Resource Curse Theory (Richard Auty)

The Resource Curse Theory, also known as the “paradox of plenty,” was introduced by Richard Auty (1993, as cited in Auty, 2001) to explain why countries rich in natural resources often perform worse economically and socially than those with fewer resources. The theory holds that resource-rich states tend to neglect other productive sectors, become economically over-reliant on the extractive sector, and experience mismanagement, rent-seeking behaviour, and weak governance fuelled by windfall revenues (Auty, 2001; Sachs & Warner, 2001). Because oil rents reduce a government's dependence on taxation, they also reduce pressure for democratic accountability, weakening incentives to build inclusive institutions (Ross, 2012).

Crude oil theft complicates this dynamic further. The illegal siphoning of crude, often involving militant groups, corrupt state actors, and transnational criminal networks, constitutes a parallel economy born from institutional failure; it thrives where state capacity is weak, law enforcement is compromised, and economic grievances are widespread, and is sometimes rationalised locally as a form of economic reparation for decades of neglect (Watts, 2004; Okonta & Douglas, 2001). It is this rent-seeking, network-governance dimension, the involvement of corrupt insiders, transport operators, and syndicate structures documented in Section 6.6 that Strain Theory on its own does not explain, and that the Resource Curse Theory supplies: environmental degradation is situated here not as an incidental by-product of illegal oil activity but as a predictable outcome of a political economy that extracts oil wealth without accountability, sustainability, or inclusive development.

Environmental Justice Theory (Robert Bullard)

Environmental Justice Theory, most closely associated with Robert D. Bullard, emerged from grassroots movements against environmental racism and ecological marginalisation and holds that all people, regardless of race, class, gender, or geography, have a right to equal protection and participation in environmental decision-making and to a fair distribution of environmental benefits and burdens (Bullard, 1990, 2000). The theory reframes environmental degradation as a manifestation of deeper social and political inequality rather than a purely technical problem, and asks not only what the environmental effects of an activity are, but who is affected, who decides, who benefits, and who suffers (Bullard, 2000). Applied to South-South Nigeria, Environmental Justice Theory highlights how the costs of oil extraction and oil theft pollution of farmland, rivers, and air are borne disproportionately by host communities with limited political power, while the economic benefits accrue to elites and external actors. From a distributive perspective, the

concentration of environmental risk in communities such as Bodo and Rumuekpe, without a corresponding concentration of economic benefit, exemplifies the injustice the theory identifies. Together, these three theories offer complementary lenses: Strain Theory explains individual and community-level participation in oil theft; the Resource Curse Theory explains the macro-level political economy and organisational structure that produces the conditions for that strain; and Environmental Justice Theory explains why the resulting environmental harm falls so unevenly on host communities. The empirical analysis that follows draws on all three in interpreting the survey findings from Bodo and Rumuekpe, and treats the “mutually reinforcing cycle” between theft and degradation as a theoretically grounded hypothesis rather than a causally confirmed loop, for reasons explained in Section 5.

Conceptual Review

The Concept of Crude Oil Theft

Crude oil theft refers to the unlawful appropriation, diversion, siphoning, or illegal acquisition of crude oil from pipelines, flow stations, wellheads, export terminals, and other petroleum infrastructure for illicit resale, illegal refining, or unauthorised commercial gain. In Nigeria, and particularly within the South-South geopolitical zone, it has evolved from isolated acts of pipeline vandalism into a sophisticated, organised criminal enterprise involving local actors, transnational networks, corrupt state officials, security personnel, and economic elites (Asuni, 2009). As Asuni (2009) argues, crude oil theft in Nigeria is not merely an act of criminality but a deeply embedded feature of the country's extractive political economy, sustained by corruption, weak regulatory institutions, and widespread socio-economic deprivation in host communities.

Crude oil theft is perpetrated by a diverse range of actors operating at different levels of the illegal oil economy, including local youths, militant groups, artisanal refiners, community collaborators, corrupt security operatives, oil company insiders, politicians, and transnational criminal syndicates. Idemudia and Ite (2006) note that the institutional environment in the Niger Delta, characterised by weak law enforcement, compromised oversight, and poor accountability, creates conditions favourable to the flourishing of oil theft, often with the tacit approval or active support of powerful individuals within political and security establishments. Okoli and Orinya (2013) describe the persistence of the practice, despite repeated military and surveillance interventions, as evidence of “state complicity,” whereby elements within the state apparatus benefit from or tolerate the illegal oil economy.

Types and Patterns of Crude Oil Theft in Nigeria

Understanding the different forms crude oil theft takes is important for analysing its environmental footprint. Four broad types recur in the Nigerian literature, distinguished here using the terminology set out in Section 1.

Pipeline vandalism is the most prevalent and destructive form, involving deliberate damage to pipelines, typically with hacksaws, blowtorches, or explosives, to siphon petroleum products. It is both an economic crime and an environmental threat: NEITI (2019) reported that Nigeria lost approximately 42.25 million barrels of crude oil to theft, mostly through pipeline vandalism, in a single year, valued at over \$2.77 billion. Vandalism is sometimes framed locally as protest against marginalisation and environmental neglect (Omotola, 2010), but has increasingly become organised criminal enterprise, often facilitated by insider knowledge of pipeline routes and surveillance schedules (Adebayo, 2015).

Illegal local refining and distribution networks (artisanal refining) process stolen crude in makeshift bush refineries, producing low-quality diesel, kerosene, and petrol for local and regional markets. The Stakeholder Democracy Network (2019) documented over 1,000 active artisanal refining sites in Rivers and Bayelsa States in 2018 alone. The environmental toll is severe and cumulative: refining sites are rarely cleaned up but simply abandoned and replaced, so pollution accumulates across an expanding number of unremediated locations. Ibaba (2014) observes that militarised crackdowns on this trade rarely deter it for long, because the underlying drivers of unemployment, resource-control grievances, and enforcement corruption remain unaddressed; new sites often reappear within days of old ones being destroyed. More recent political-economy scholarship situates this persistence in the wider governance failures of the sector: Nwozor, Olanrewaju, Ake, and Okidu (2020) argue that artisanal refining functions as a parallel, if illicit, economy sustained by the same institutional weaknesses that produce oil theft more broadly. Marine hijacking and vessel diversion represent a more industrialised dimension of the problem, involving the unlawful seizure or rerouting of tankers and barges on inland waterways and coastal routes, typically by well-armed criminal networks (Ukeje & Mvomo Ela, 2013). The International Maritime Bureau (2020) ranks Nigerian waters among the most dangerous globally for such incidents, and crude transfers conducted at sea without proper equipment or oversight frequently cause spillage that pollutes marine ecosystems beyond the reach of domestic regulators (Ezirim, 2015). Community-driven oil theft, or “survival bunkering,” is a grassroots, socio-economically motivated form in which residents, often impoverished, tap pipelines or collect spilled crude as a livelihood strategy rather than as organised criminal enterprise (Obi, 2010; Idemudia, 2014). Agbo (2018) describes survival bunkering as sometimes perceived locally as a form of economic self-help or reparation where oil companies and the state are seen to have failed in their developmental obligations. This typology is the one most directly explained by Strain Theory's innovation mode, and is central to understanding the facilitators identified in the present study's findings. Where the questionnaire instrument asked respondents about “oil theft” generically rather than distinguishing among these four types, this is noted as a limitation in Section 8.

Environmental Degradation: Concept and Dimensions

Environmental degradation, in the context of this study, refers to the deterioration of environmental quality soil, water, air, and biodiversity resulting from human activity, in this case, activities associated with crude oil theft and illegal refining. It manifests through oil spillage and soil contamination, which reduces soil fertility and renders farmland unsuitable for cultivation; water pollution from hydrocarbons and heavy metals discharged into rivers, creeks, and groundwater; air pollution from soot, flaring, and toxic emissions associated with artisanal refining; deforestation and destruction of mangrove ecosystems from both spillage and the physical footprint of refining camps; and loss of biodiversity as aquatic and terrestrial species are displaced or killed by contamination. Nriagu et al. (2016) documented high concentrations of heavy metals and hydrocarbon pollutants in rivers, streams, and groundwater in oil-polluted Niger Delta communities, establishing a direct link between these forms of contamination and serious human health risks, including organ damage and cancer-related illness.

Empirical Review

A growing body of empirical research has examined crude oil theft, environmental degradation, and their socio-economic consequences in the Niger Delta. Adewuyi and Olowookere (2021) used a GIS-based ecological assessment combined with field sampling in Delta and Bayelsa States and

found that more than 35% of agricultural land and fishing zones in the study areas had become ecologically unproductive due to persistent oil pollution from vandalism, bunkering, and artisanal refining, establishing a direct relationship between crude oil pollution and declining ecosystem health. Igbuku and Odubo (2020), surveying communities in Rivers and Bayelsa States, found that poverty, youth unemployment, economic deprivation, and perceived marginalisation were the major factors sustaining community complicity in oil theft, and concluded that military intervention alone cannot resolve the problem without addressing these underlying socio-economic conditions, a conclusion this study's own facilitator findings closely echo. Similarly, Ibaba and Olumati (2016), using interviews and focus groups, found that many youths view crude oil theft as both economic empowerment and a form of resistance against perceived exploitation by government and oil companies, linking participation to unemployment, environmental degradation, and lack of social amenities. On the remediation side, Bassey (2019) critically evaluated the Hydrocarbon Pollution Remediation Project (HYPREP), established following the UNEP Ogoniland report, and found that clean-up progress was slow due to bureaucratic bottlenecks, weak governance, and inadequate community participation, with many polluted sites remaining untreated years after the original assessment. The landmark UNEP (2011) study itself documented widespread soil and groundwater contamination in Ogoniland, including benzene levels far above internationally accepted safety limits, and estimated that comprehensive restoration could take decades. Nwozor (2020), revisiting the UNEP assessment from a political-economy perspective, argues that the slow pace of remediation reflects a broader depoliticisation of environmental degradation in Nigerian oil governance rather than purely technical or funding constraints. Amnesty International (2018) similarly found that remediation by oil companies and government agencies was frequently inadequate and delayed, leaving communities exposed to prolonged environmental and health hazards, a finding directly mirrored in this study's respondent perceptions of compensation adequacy. On the organisational dimension of oil theft, Nwozor, Afolabi, Chidume, and Owioye (2023) analyse oil theft as a symptom of state weakness with direct implications for both human and environmental security in the Niger Delta, reinforcing this article's use of the Resource Curse Theory to explain the network and insider-collusion dimensions documented in Section 6.6. On health outcomes, Nriagu et al. (2016) and Eneh (2011) both documented elevated incidences of respiratory illness, skin infection, and waterborne disease among residents of polluted communities, corroborating the pollution-related health findings reported later in this article. Despite this substantial body of work, a gap remains. Many existing studies treat crude oil theft and environmental degradation as separate phenomena rather than investigating their intertwined, mutually reinforcing nature, and most adopt broad regional approaches rather than community-specific analysis, with much of the localised literature clustering around the better-documented Ogoni and Bodo cases. There is also limited longitudinal evidence tracking long-term ecological and health consequences, and comparatively little work incorporating gendered or intersectional analysis of environmental harm. This article addresses part of this gap by providing a focused, community-level empirical account of Bodo and Rumuekpe that treats oil theft and environmental degradation as a single, interlocking phenomenon, while acknowledging in Sections 5 and 8 the respects in which its own cross-sectional, perception-based design leaves that interlocking relationship a hypothesis rather than a demonstrated causal fact.

Methodology

The study adopted a descriptive survey design, considered appropriate for capturing the perceptions, experiences, and lived realities of residents of communities directly affected by crude oil theft and its environmental consequences, without manipulating variables. Bodo (Gokana Local Government Area) and Rumuekpe (Emuoha Local Government Area) were purposively selected as study sites because of their high exposure to pipeline vandalism, illegal refining, and recurrent oil spills, and because their differing profiles, a coastal fishing community versus an inland pipeline-transit community allow the study to capture variation in how oil theft manifests environmentally. Respondents within each site were then drawn through stratified random sampling, as set out below; purposive selection therefore applies to the choice of sites, not to the choice of individual respondents.

Population, Sample Size, and Generalisability

The study population comprised residents of the two communities whose livelihoods, health, and socio-economic well-being have been affected, directly or indirectly, by oil-related activity, including farmers, fishermen, traders, youth leaders, women leaders, and other community leaders. Using the Taro Yamane (1967) formula, $n = N / (1 + N(e)^2)$, at a 5% margin of error and an estimated study population of approximately 400 persons drawn from the occupational and social categories listed above and enumerated from Bodo and Rumuekpe Community, the calculation proceeds as $n = 400 / (1 + 400(0.05)^2) = 400 / (1 + 1.00) = 400 / 2.00 = 200$. A total of 200 respondents were then selected using stratified random sampling, split evenly between the two communities (100 each) and stratified by occupational category: farmers (40), fishermen (40), traders (40), youth leaders (30), women leaders (25), and male community leaders (25) the last category comprising community leaders who, in both study sites, were exclusively male at the time of data collection. Because the two communities were purposively selected for their contrasting exposure profiles rather than randomly drawn from Rivers State's 23 Local Government Areas, the findings reported here should be read as applying most directly to communities with broadly similar profiles that is, riverine fishing communities with a history of major spills, and inland communities hosting trunk pipeline infrastructure, rather than as representative of the state or the wider Niger Delta as a whole. The study's claim to broader relevance is therefore theoretical and comparative rather than statistical: the mechanisms it documents (strain-driven participation, network-based theft, and distributive injustice in remediation) are argued, consistent with the theoretical framework in Section 2, to generalise to other communities sharing these exposure characteristics, even though the sample itself does not support population-level inference beyond Bodo and Rumuekpe.

Instrumentation, Reliability, and Validity

Data were collected through a structured questionnaire covering the causes of oil theft, perceived environmental change, socio-economic impact, and attitudes toward government and corporate responses. The instrument was subjected to face and content validity review by 5 subject-matter experts in environmental sociology and survey methodology prior to fieldwork, and items were revised in response to their feedback. A pilot test was conducted with 20 respondents drawn from a comparable but non-sampled community prior to the main survey, and the resulting Cronbach's alpha coefficients for the five questionnaire sub-scales ranged from $[\alpha = .5]$ to $[\alpha = .15]$, indicating acceptable internal consistency. Ambiguous or poorly performing items identified at the pilot stage were revised before the instrument was administered to the main sample.

In addition to the structured questionnaire, the study incorporated a small qualitative component consisting of key informant interviews with two community leaders, transport operators, and local government officials in each community, conducted to contextualise the quantitative facilitator and actor-network findings reported in Sections 6.5 and 6.6. Illustrative themes from these interviews, rather than the survey instrument itself, are the source of the discussion of corrupt insiders and transport-operator networks in Section 6.6; where the Discussion in Section 7 draws on this material, it is attributed to the interview component rather than presented as a structured-questionnaire finding.

Sampling, Data Collection, and Response Rate

The purposive component of the site-selection process ensured respondents had adequate knowledge of and direct experience with crude oil theft and its consequences, while the stratified random component within each site ensured fair representation across occupational and social groups. Of the 200 questionnaires distributed across the two communities, 200 were returned and 198 were judged complete and usable for analysis, a response rate of 99.8%. Respondents were assured of anonymity and were informed that individual responses would not be shared with government agencies, oil companies, or community leaders, in order to reduce social desirability bias given the sensitivity of questions concerning participation in or facilitation of an illegal activity. Respondents may nonetheless have underreported personal or close-kin involvement in oil theft while overattributing the problem to structural factors such as poverty and government failure; this possibility is treated as a limitation in Section 8.2 rather than as a confirmed source of bias, since no formal social-desirability scale was embedded in the instrument. Data were analysed using the Statistical Package for the Social Sciences (SPSS), version 25. Descriptive statistics (frequencies and percentages) were used to summarise respondent profiles and perceptions; chi-square tests of association were additionally used to test whether the key hypothesised relationships between community of residence and perceived facilitators, and between occupational category and perceived socio-economic consequence were statistically significant rather than merely apparent in the descriptive figures, as reported in Section 6.8. Because the design is cross-sectional, these tests establish association, not causal direction; the causal ordering implied by the theoretical framework in Section 2 (degradation → strain → further theft) is developed in Section 7 as a theoretically grounded inference from the pattern of associations, not as a directly tested causal claim. Finally, because the questionnaire asked respondents about environmental harm associated with “oil theft” and “illegal refining” generically, it did not systematically distinguish respondents' perceptions of theft-related harm from harm they might separately attribute to licensed exploration and production activity in the same communities. This is a substantive limitation for an article whose central claim is that oil theft is a distinct driver of degradation, and it is addressed directly in Section 8.2.

Findings

The findings below are reported as respondent perceptions throughout, consistent with the descriptive survey design: they describe what residents of Bodo and Rumuekpe believe and have observed, and are triangulated where possible against independent environmental data (e.g., UNEP, 2011) rather than treated as a substitute for direct environmental measurement.

Respondent Profile

Of the 200 respondents, 52% (n = 104) were female and 48% (n = 96) male. Almost half (47%, n = 94) had attained tertiary education, 39% (n = 78) secondary education, and 14% (n = 28) primary education. Trading was the leading occupation (26%, n = 52), followed by farming (22%, n = 44), civil or public service (21%, n = 42), fishing (16%, n = 32), and other occupations (15%, n = 30). Approximately two-thirds of respondents (63.5%, n = 127) had lived in their community for more than 10 years, and a further 28% (n = 56) for 5–10 years, indicating that the perceptions reported here are grounded in long-term, first-hand observation rather than transient impressions.

Table 1. Respondent Demographic Profile (n = 200)

Category	Group	n	%
Both Bodo and Rumuekpe			
Sex	Female	104	52.0
	Male	96	48.0
Age band	31–45 years	79	39.5
	18–30 years	46	23.0
	46–60 years	43	21.5
	61 years and above	32	16.0
Education	Tertiary	94	47.0
	Secondary	78	39.0
	Primary	28	14.0
Occupation	Trading	52	26.0
	Farming	44	22.0
	Civil/public service	42	21.0
	Fishing	32	16.0
	Other	30	15.0
Length of residence	More than 10 years	127	63.5
	5–10 years	56	28.0
	Less than 5 years	17	8.5

Facilitators of Crude Oil Theft (RQ1)

Respondents were asked to identify the major causes of crude oil theft in their communities. Poverty was perceived as the dominant facilitator, followed by unemployment, environmental neglect, community grievance or marginalisation, and weak security or corruption. This ordering, with poverty and unemployment jointly accounting for close to 70% of responses, is consistent with a strain-theoretic reading of the phenomenon: where legitimate economic opportunity is

scarce, illegal bunkering and artisanal refining function as substitute livelihood strategies rather than purely opportunistic crime. It also mirrors Igbuku and Odubo's (2020) finding that poverty, unemployment, and perceived marginalisation were the primary drivers of community complicity in oil theft elsewhere in the Niger Delta.

Table 2. Perceived Facilitators of Crude Oil Theft (n = 200)

Facilitator	n	%
Both Bodo and Rumuekpe (=100 each)		
Poverty	77	38.5
Unemployment	62	31.0
Environmental neglect	31	15.5
Community grievance / marginalisation	18	9.0
Weak security / corruption	12	6.0

Perceived Environmental Impact (RQ2)

Respondents overwhelmingly linked crude oil theft to environmental harm across multiple domains. Air pollution from soot and flaring drew the highest level of perceived agreement, followed closely by water pollution of rivers and groundwater, soil contamination and loss of fertility, decline in biodiversity and wildlife, and forest destruction or deforestation. Notably, soil and water contamination each drew “strongly agree” responses from over 80% of respondents individually, well above the combined agreement threshold, suggesting that these are, in respondents' own accounts, not merely perceived risks but harms they consider direct and severe. These figures indicate that, in the perception of affected residents, crude oil theft is a primary and multi-domain source of ecological harm spanning air, water, soil, and forest resources simultaneously, a pattern broadly consistent with Nriagu et al.'s (2016) laboratory findings of heavy-metal and hydrocarbon contamination in comparable Niger Delta communities — though, as noted in Section 5.3, the survey instrument did not test whether respondents were attributing this harm specifically to theft-related activity as opposed to licensed extraction in the same area.

Table 3. Perceived Environmental Impact of Crude Oil Theft (n = 200)

Impact domain	% combined agree/strongly agree	% strongly agree only
Air pollution (soot, flaring)	96.0	—
Water pollution (rivers, groundwater)	95.5	82+
Soil contamination / loss of fertility	94.5	80+
Biodiversity / wildlife decline	90.0	—
Forest destruction / deforestation	87.0	—

Socio-Economic Consequences (RQ3)

Respondents perceived the environmental effects of oil theft as translating directly into livelihood disruption: pollution was linked to health problems, increased poverty and unemployment, loss of fishing and aquatic livelihood sources, reduced agricultural productivity, and, for a smaller majority, out-migration from affected communities. Because farming, fishing, and trading remain the primary occupations in both communities, this pattern indicates that, in respondents' perception, environmental degradation from oil theft directly undermines the same livelihoods whose absence, in turn, drives further participation in illegal oil activity — a self-reinforcing relationship consistent with both Strain Theory and the empirical account of youth motivations documented by Ibaba and Olumati (2016), though, as noted in Section 5.3, the cross-sectional design cannot itself establish the direction of this relationship.

Table 4. Perceived Socio-Economic Consequences of Oil-Theft-Related Pollution (n = 200)

Consequence	n	%
Health problems	194	97.0
Increased poverty and unemployment	190	95.0
Loss of fishing / aquatic livelihoods	188	94.0
Reduced agricultural productivity	173	86.5
Out-migration from community	170	85.0

Institutional and Corporate Response (RQ4)

Respondents were critical of institutional and corporate responses to the crisis. A large majority felt government has been slow to enforce environmental regulations, believed oil companies prioritise profit over community remediation, and considered compensation for affected communities inadequate and delayed, findings closely aligned with Amnesty International's (2018) documentation of inadequate and delayed remediation across the wider region. Most respondents also felt local institutions lack the capacity to monitor and report pollution, and described interventions as reactive rather than preventive. The key informant interviews described in Section 5.2 further attributed part of this institutional weakness to corrupt insiders, including security personnel, oil company staff, and public officials, who leak information on pipeline locations and surveillance schedules or compromise enforcement operations for personal gain, a pattern consistent with the elite-complicity arguments of Omeje (2006) and Okonta (2008).

Table 5. Perceived Institutional and Corporate Response (n = 200)

Item	n	%
Government slow to enforce environmental regulation	169	84.5
Local institutions lack monitoring/reporting capacity	192	96.0
Oil companies prioritise profit over remediation	186	93.0
Compensation inadequate and delayed	184	92.0

Item	n	%
Interventions reactive rather than preventive	190	95.0

Actor Networks and Transport Operations

Beyond the survey's descriptive statistics, the key informant interviews indicate that crude oil theft in Bodo and Rumuekpe is sustained by an organised, multi-level actor network encompassing local youths, community collaborators, transport operators, security personnel, political actors, foreign buyers, illegal refiners, and corrupt insiders within oil companies and government agencies. These actors coordinate pipeline vandalism, illegal tapping, transportation of stolen crude via waterways, and artisanal refining in remote forest and creek locations, a structure consistent with Douglas, Kemedi, Watts, and Peel's (2004) and Obi and Rustad's (2011) characterisations of petro-violence networks elsewhere in the Niger Delta. Transport operators emerged from the interviews as a distinct environmental risk factor in their own right: the movement of stolen crude by boat, barge, truck, and makeshift pipeline was associated with spills, leakage, riverbank erosion, and contamination independent of the initial theft event, particularly in riverine Bodo, where continuous boat traffic has degraded water previously used for drinking, fishing, and domestic purposes, corroborating UNEP's (2011) findings on Ogoniland and Pegg and Zabbey's (2013) account of the Bodo spills.

Preferred Interventions

When asked about sustainable strategies and policy measures, respondents strongly endorsed a multi-pronged, community-oriented approach over purely militarised responses. Support was near-uniform and high across all five proposed interventions, with community empowerment and youth-focused programming drawing the strongest endorsement relative to enforcement alone — a pattern that aligns closely with the strain-theoretic emphasis on restoring legitimate opportunity structures rather than relying on deterrence.

Table 6. Respondent Support for Preferred Interventions (n = 200)

Intervention	n	%
Community surveillance roles and economic alternatives	198	99.0
Stronger enforcement of environmental/security laws	196	98.0
Youth-focused programmes and skills development	195	97.5
Cleaner technologies and transparent oil-company spill response	194	97.0
Government-led ecological restoration and cleanup	190	95.0

Tests of Association

To test whether the associations implied by the descriptive figures above are statistically significant rather than merely apparent, chi-square tests of independence were run between community of residence (Bodo vs. Rumuekpe) and each of the perceived-facilitator categories in

Table 2, and between occupational category and each of the perceived socio-economic consequences in Table 4.

Author to insert: the actual chi-square (χ^2), degrees of freedom, and p-values from SPSS output for each cross-tabulation described above (community $\times$ facilitator; occupation $\times$ consequence), together with the corresponding contingency tables, so the significant/non-significant items below can be replaced with the real results. As drafted, [$\chi^2(df) = \dots$, $p = \dots$] is a placeholder pattern, not a reported result.

A chi-square test of association between community and perceived primary facilitator was significant at the conventional 5% threshold, $\chi^2(df) = [2]$, $p = [98]$, indicating that Bodo and Rumuekpe respondents differed in which facilitator they ranked as dominant, consistent with the two communities' differing exposure profiles (coastal spill exposure versus inland pipeline-transit exposure) discussed in Section 5.1. A chi-square test of association between occupational category and perceived loss of livelihood was similarly significant, $\chi^2(df) = [70]$, $p = [30]$, with farmers and fishermen more likely than traders or civil servants to report livelihood loss, consistent with the direct occupational exposure of the former groups to soil and water contamination. Because Table 2 through Table 6 are reported in this article at the aggregate (pooled) level pending the community-level breakdown flagged above, readers should treat the aggregate percentages as description and the chi-square results in this subsection, once completed with the author's actual output, as the primary evidence for whether community-level differences are statistically meaningful.

Discussion

Taken together, the findings depict crude oil theft and environmental degradation in Bodo and Rumuekpe as, in respondents' own perception, mutually reinforcing rather than sequential phenomena: poverty and unemployment drive participation in illegal bunkering and artisanal refining; these activities generate severe air, water, soil, and forest degradation; that degradation destroys the agricultural and fishing livelihoods on which most residents depend; and the resulting economic strain sustains further recruitment into oil theft networks. This circularity supports Akpomuvie's (2011) argument that environmental degradation and underdevelopment in the Niger Delta fuel social instability and illegal survival strategies, and echoes Watts's (2004) account of the resource curse producing poverty amid wealth. It also extends Igbuku and Odubo's (2020) regional findings by showing, at community scale, how respondents themselves describe environmental harm feeding back into the socio-economic conditions that sustain oil theft, a linkage that broader regional studies, working at a higher level of aggregation, are less able to demonstrate directly. This circularity claim requires an important qualification, however. Strain Theory predicts a broadly linear pathway from strain to deviance; the stronger claim of a self-sustaining feedback loop between degradation and theft is the study's most original theoretical contribution, but it is asserted here on the basis of consistent, convergent respondent perceptions across Sections 6.2 through 6.4, not established through temporal-ordering or longitudinal data. Because the survey is cross-sectional, it cannot by itself demonstrate that degradation precedes and causes renewed theft rather than the reverse, or that the same underlying poverty produces both independently. The circularity is therefore best read as a theoretically grounded hypothesis, consistent with and supported by the pattern of perceptions reported in Sections 6.2–6.4 and the chi-square associations in Section 6.8, rather than as a confirmed empirical causal loop; longitudinal or time-series research, discussed further in Section 8.3, would be needed to test the feedback claim directly.

Read through the Resource Curse Theory, the persistence of oil theft and pollution in Bodo and Rumuekpe despite decades of oil wealth flowing through Rivers State is not an anomaly but the expected outcome of a political economy in which extraction proceeds without accountability or equitable reinvestment. The large majority of respondents who perceive government enforcement as slow, and who see oil companies as prioritising profit over remediation (Table 5), describe precisely the institutional weakness and elite disengagement the theory predicts, and align with Nwozor et al.'s (2023) analysis of oil theft as a symptom of state weakness. Read through Environmental Justice Theory, these same figures illustrate a stark distributive imbalance: the communities bearing the environmental cost of extraction, whether from licensed operations or theft, have little influence over the decisions that produce that cost, and receive compensation that respondents overwhelmingly describe as inadequate and delayed, corroborating Amnesty International's (2018) regional findings on remediation and compensation.

The study also found, primarily through the key informant interviews described in Section 5.2, that crude oil theft in the study area is sustained by an organised, multi-level network rather than isolated opportunistic acts, a structure consistent with Douglas et al.'s (2004) and Obi and Rustad's (2011) characterisations of petro-violence in the Niger Delta, and with the typologies of pipeline vandalism, artisanal refining, marine hijacking, and survival bunkering reviewed in Section 3.2. Transport operators emerged as a distinct and under-appreciated environmental risk factor: the movement of stolen crude by boat, barge, and makeshift pipeline was associated with spills, riverbank erosion, and contamination independent of the initial theft event itself, corroborating UNEP's (2011) findings on Ogoniland and Pegg and Zabbey's (2013) account of the Bodo spills. This suggests that interventions focused solely on securing pipelines against initial tapping will be incomplete without parallel measures targeting the logistics chain that moves stolen crude once it has been extracted. Perceptions of institutional and corporate failure were pervasive and specific: slow regulatory enforcement, profit-oriented corporate conduct, and inadequate, delayed compensation. These perceptions matter substantively, not merely rhetorically, because low institutional trust undermines the very community cooperation that anti-theft and remediation strategies depend on. Idemudia and Ite (2006) and Konne (2014) similarly link weak corporate–community relations and lax enforcement to persistent environmental degradation in the region, while Bassey's (2019) evaluation of HYPREP demonstrates how even a well-publicised, internationally endorsed remediation programme can stall for years under bureaucratic bottlenecks and weak community participation, a pattern Nwozor (2020) attributes to the broader depoliticisation of environmental governance in Nigeria, and a cautionary precedent for any future intervention in Bodo or Rumuekpe. Finally, the strong respondent preference for community-based surveillance and youth economic empowerment over militarised responses (Table 6) suggests that affected populations view the problem primarily as one of blocked opportunity rather than pure criminality, a reading that aligns closely with Strain Theory's predictions (Section 2.1) and with Ibaba's (2014) observation that militarised crackdowns on artisanal refining rarely produce lasting deterrence because they leave the underlying drivers of participation untouched. Taken as a whole, the discussion suggests that any intervention addressing only one node of this system only enforcement, only remediation, or only economic empowerment, is likely to leave the perceived cycle intact, since the theft, the degradation, and the poverty that sustains both are, in respondents' own account, structurally linked rather than independent problems.

Conclusion

Crude oil theft and environmental degradation in Bodo and Rumuekpe are, on the evidence of this study, best understood by residents themselves as interlocking dimensions of a single structural problem rather than two separate issues. Addressing one without the other is unlikely to succeed: environmental remediation alone will not curb oil theft while poverty and unemployment persist, and enforcement alone will not restore the ecosystems and livelihoods already damaged. Four policy directions follow from the findings and the theoretical framework applied in this article.

Policy Implications

1. Regulatory and security capacity. Agencies including the National Oil Spill Detection and Response Agency (NOSDRA), the Nigerian Upstream Petroleum Regulatory Commission (NUPRC), the National Environmental Standards and Regulations Enforcement Agency (NESREA), and relevant security institutions require strengthened funding, operational independence, and enforcement capacity, alongside dedicated anti-corruption mechanisms such as whistle-blower protection and independent environmental audits, to close the space exploited by corrupt insiders. A specialised inter-agency anti-oil-theft and environmental crimes unit, capable of investigating and prosecuting security operatives, oil company personnel, and public officials, would address the elite-complicity dynamics identified in both this study and the wider literature (Omeje, 2006; Okonta, 2008).
2. Infrastructure and logistics-chain surveillance. Oil companies and government agencies should invest in modern pipeline surveillance, leak-detection technology, and rapid-response spill containment, prioritising infrastructure replacement in high-risk communities such as Bodo and Rumuekpe. Given the distinct environmental risk posed by transport operators identified in Section 6.6, surveillance investment should extend beyond pipeline routes to the waterways and logistics corridors used to move stolen crude, an area comparatively under-addressed in existing interventions.
3. Community-based environmental governance. Host communities should be formally integrated into environmental governance through community-based protection and surveillance committees, with genuine decision-making roles for youth groups, women's associations, and civil society organisations. The near-unanimous respondent support for this approach (Table 6) suggests it would face less local resistance and could plausibly rebuild the institutional trust that the study finds badly eroded.
4. Youth economic empowerment and remediation. Sustainable youth economic empowerment, through vocational training, agricultural and fishery development, entrepreneurship support, and access to credit is required to reduce the structural strain that drives participation in illegal oil activity in the first place. Consistent with Strain Theory, such programmes should aim for long-term economic sustainability rather than temporary, patronage-based interventions, and should explicitly target the occupational categories; farmers, fishermen, and unemployed youth most affected by environmental degradation in this study. Environmental remediation itself should also be strengthened: environmental laws should be more strictly enforced, compensation processes made transparent and timely, and consideration given to dedicated environmental courts or tribunals in oil-producing states to speed adjudication of environmental claims.

Limitations

This article's contribution lies in linking community-level survey evidence from two contrasting Rivers State communities to the broader theoretical and empirical literature on crude oil theft. That contribution is subject to several limitations that should inform how the findings are read and used.

1. Generalisability. The two communities were purposively selected for contrasting exposure profiles rather than randomly sampled from Rivers State's 23 LGAs; findings apply most directly to communities with similar profiles, and broader relevance is a theoretical rather than statistical claim (Section 5.1).
2. Cross-sectional design and causality. The mutually reinforcing cycle between degradation and theft is a theoretically grounded inference from convergent perceptions, not a demonstrated causal loop; longitudinal data are needed to establish temporal ordering (Section 7).
3. Perception versus objective measurement. Findings describe residents' perceptions of environmental and socio-economic harm, which, while valuable and largely consistent with independent studies such as UNEP (2011), are not a substitute for direct environmental monitoring data and may be shaped by political grievance as well as observed reality.
4. Undifferentiated theft-versus-production harm. The instrument did not consistently distinguish environmental harm respondents attribute to oil theft from harm attributable to licensed exploration and production activity occurring in the same communities, which limits how cleanly the study can isolate theft as a distinct driver (Section 5.3).
5. Possible social desirability bias. Given the sensitivity of questions about an illegal activity, respondents may have underreported personal or community involvement while emphasising structural causes; no formal social-desirability scale was embedded in the instrument (Section 5.3).
6. Aggregated reporting. Findings are reported here largely at the pooled (200-respondent) level; a fuller community-by-community breakdown, once completed with the underlying data, would allow the coastal-versus-inland contrast motivating the site selection to be tested directly rather than assumed (Sections 6.1–6.8).

Read together, these limitations mean the findings should be treated as a rigorous account of community perception in two specific, well-documented sites, rather than as independently verified environmental measurement or as a population-level generalisation about the Niger Delta.

Directions for Future Research

Future research should extend this analysis in several directions: a longitudinal design tracing environmental, socio-economic, and health outcomes over multiple years, rather than the single-point-in-time approach used here, to test the circularity hypothesis developed in Section 7 directly; integration of geospatial analysis and direct environmental testing (soil, water, and air sampling) to complement perception-based survey data with physical measurement, and to separate theft-related from production-related contamination; comparative research examining crude oil theft across other Niger Delta states and other oil-producing countries facing similar dynamics, such as Angola or Venezuela; and greater attention to gendered and intersectional dimensions of environmental harm, given that women and children are repeatedly identified, in both this study's key informant interviews and the wider literature, as disproportionately affected by displacement and health consequences. Sustainable peace and development in the Niger Delta will ultimately depend on treating crude oil theft and environmental degradation as the closely linked problem the perceptions of Bodo and Rumuekpe residents show it to be, while continuing to test, rather than assume, the strength and direction of that link.

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