

Effect of Gas Flaring and Sustainability of Oil and Gas Firms in Niger Delta**Ochuba Jude Onyekachukwu¹ & Dr. Henry Ajero²****Abstract**

This study examined the effect of gas flaring on the sustainability of oil and gas firms in the Niger Delta, using responses from 237 environmental compliance officers across the region. A survey design was adopted, and data were collected through structured questionnaires and interviews. Findings revealed that 63.3% of respondents experienced gas flaring daily or weekly, while 63.3% also described the environmental degradation as severe or very severe. Moreover, 59.0% reported that gas flaring negatively impacts their firm's sustainability goals, and 54.8% indicated high or very high impacts on operational performance. With only 34.1% rating existing policies as effective, and 43.9% affirming high or full regulatory compliance, the results highlight a regulatory gap in enforcement. The study concludes that gas flaring remains a major threat to environmental health and corporate sustainability. It recommends enhanced regulatory enforcement, adoption of gas recovery technologies, and greater stakeholder transparency to address the persistent challenges.

Keywords: Gas Flaring, Environmental Degradation, Sustainability, Oil and Gas Firms, Regulatory Compliance

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Introduction

Gas flaring remains one of the most persistent environmental challenges in the Niger Delta, despite longstanding regulatory prohibitions. As Nigeria continues to be a major oil-producing nation, a significant proportion of associated gas is still flared during crude oil extraction. This practice has not only contributed to environmental degradation but also presents severe implications for the sustainability of oil and gas firms operating in the region. The National Oil Spill Detection and Response Agency (NOSDRA) estimated that Nigeria flares around 70% of associated gas, leading to economic losses exceeding \$2 billion annually and significant carbon emissions that contribute to climate change (Ogunze & Abubakar, 2019).

The environmental consequences of gas flaring in the Niger Delta are profound. Acid rain, heat radiation, and greenhouse gas emissions have deteriorated soil fertility, contaminated water bodies, and reduced biodiversity. These effects have direct implications for the sustainability of oil and gas firms, as environmental degradation weakens community relations and operational stability. Uchehbulam, Aliyuda and John (2022) found that continued flaring contributes to ecosystem disruption and increases pressure on companies to adopt cleaner technologies. Similarly, Seiyaboh and Izah (2017) showed that prolonged flaring significantly impacts water quality and agricultural productivity, thereby endangering the long-term viability of firms that rely on local stakeholder cooperation.

Health concerns among host communities have also intensified resistance to oil operations, as exposure to flaring byproducts is associated with respiratory ailments, hypertension, and increased cancer risks. Osuoha and Fakutiju (2017) evaluated the socio-health impacts of gas flaring and found it contributes to persistent tension between oil companies and residents, thereby complicating corporate social responsibility efforts and threatening the social license to operate. Dienye, Ikwemesi, and Akankali (2023) further documented the adverse impacts of thermal pollution on fisheries, revealing that gas flaring undermines community livelihoods and increases operational risks for oil firms.

Despite various regulatory frameworks such as the Associated Gas Re-injection Act and recent amendments to the Petroleum Industry Act, enforcement remains weak. Companies often find it more economical to pay fines than to invest in gas recovery technologies. This regulatory laxity creates sustainability challenges, as firms face both reputational risks and potential litigation over environmental and health concerns. Olujobi et al. (2020) noted that ineffective legal enforcement hampers the transition toward sustainable oil and gas practices, weakening environmental governance across the region.

Furthermore, gas flaring thus presents a multidimensional threat to the sustainability of oil and gas firms in the Niger Delta, affecting environmental integrity, community relations, health outcomes, and regulatory compliance. Without a strategic shift toward sustainable flaring alternatives and robust policy enforcement, firms risk long-term operational disruptions and declining social capital. Moreover, aligning operational strategies with environmental sustainability is increasingly crucial for maintaining investor confidence and meeting global environmental standards.

Statement of the Problem

In an ideal operational and environmental framework, oil and gas firms are expected to adhere to sustainable practices that minimize ecological degradation, protect community health, and comply with global environmental standards. Gas, being a valuable energy resource, should ideally be harnessed and utilized efficiently through technologies such as gas re-injection, liquefied natural gas (LNG) conversion, or power generation. This approach ensures not only environmental protection but also enhances the economic viability and reputation of oil-producing firms in line with sustainable development goals.

However, in the Niger Delta, the reality sharply contrasts with this ideal. Despite various laws and environmental regulations, gas flaring continues at alarming levels. Companies frequently flare associated gas due to poor infrastructure, weak regulatory enforcement, and cost-saving motives. The resultant emissions have contributed significantly to environmental degradation polluting air, soil, and water and exposing local populations to chronic health hazards. Furthermore, the persistence of this practice reflects institutional failure and corporate irresponsibility, posing serious threats to the ecological balance and social license to operate.

If this problem remains unaddressed, the consequences will be far-reaching. Continued gas flaring will exacerbate climate change, escalate community unrest, and erode trust between oil firms and their host communities. Moreover, the reputational and legal risks could reduce foreign investment inflows and diminish the global competitiveness of Nigeria's oil and gas sector. Ultimately, unsustainable flaring practices will endanger not only the environment and human health but also the long-term operational sustainability of oil and gas firms in the region.

Objectives of the Study

The main purpose of this study is on effect of gas flaring and sustainability of oil and gas firms in Niger delta. The specific objectives of the study are to:

- i. To examine the relationship between gas flaring activities and environmental degradation in the Niger Delta region.
- ii. To assess the impact of gas flaring on the long-term sustainability and operational performance of oil and gas firms.
- iii. To evaluate the effectiveness of existing regulatory frameworks in mitigating gas flaring practices among oil and gas companies in the Niger Delta.

Research Questions

The study provided answers to the following research questions.

- i. What is the extent to which gas flaring contributes to environmental degradation in the Niger Delta region?
- ii. How does gas flaring affect the sustainability and operational performance of oil and gas firms in the region?

- iii. How effective are the current regulatory policies in controlling gas flaring practices among oil and gas companies in the Niger Delta?

Statement of Hypotheses

The following hypotheses in null form (H_0) guided this study

- i. Gas flaring has no significant effect on environmental degradation in the Niger Delta region.
- ii. Gas flaring does not significantly affect the sustainability and operational performance of oil and gas firms in the Niger Delta.
- iii. Existing regulatory frameworks do not significantly influence the reduction of gas flaring practices among oil and gas companies in the Niger Delta.

Significance of the Study

This study on the Effect of Gas Flaring and Sustainability of Oil and Gas Firms in the Niger Delta is relevant to a broad range of stakeholders. Its findings will be beneficial to the following individuals, groups and institutions:

- i. **Oil and Gas Companies:** The study will help oil and gas firms operating in the Niger Delta to understand the environmental and socio-economic impacts of gas flaring on their sustainability. It will provide insights into how unsustainable practices can affect operational efficiency, stakeholder relations, and long-term profitability. The research encourages companies to adopt innovative gas utilization strategies, reduce waste, and enhance environmental compliance.
- ii. **Host Communities in the Niger Delta:** The study will empower local communities affected by gas flaring by highlighting its impact on health, agriculture, and livelihood. It can be used to demand greater accountability from oil firms and advocate for improved environmental and health protection. The knowledge can also enable these communities to engage in informed dialogue with both companies and government authorities.
- iii. **Academic Researchers and Students:** The study contributes to the growing body of literature on environmental sustainability, energy policy, and corporate social responsibility. It will serve as a reference for future research, thesis work, and academic discussions. Scholars can build on its findings to conduct comparative or longitudinal studies in similar oil-producing regions globally.
- iv. **Public Health Officials and Agencies:** Given the health hazards linked to gas flaring—such as respiratory diseases, hypertension, and cancer—this study will inform public health authorities of the risks and necessary interventions. It emphasizes the need for targeted health monitoring, environmental health education, and healthcare infrastructure in communities exposed to gas emissions.

Scope of the Study

This study focuses on examining the effect of gas flaring on the sustainability of oil and gas firms in the Niger Delta region of Nigeria. The research is geographically limited to the nine states that constitute the Niger Delta: Abia,

Akwabom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo, and Rivers. These states were selected due to their prominence in Nigeria's oil and gas activities and the prevalence of gas flaring within their territories.

The study specifically investigates the relationship between gas flaring activities and key sustainability dimensions—namely, environmental degradation, regulatory compliance, operational performance, and stakeholder relations—as they affect the long-term viability of oil and gas companies.

The population includes environmental compliance officers working in licensed oil and gas firms across the Niger Delta, as they are directly involved in the implementation and oversight of environmental sustainability measures. Data was collected in 2025, making the findings reflective of current regulatory frameworks, including recent changes under the Petroleum Industry Act (PIA).

While the study provides a comprehensive evaluation of gas flaring impacts, it does not cover upstream or downstream oil and gas activities in other regions of Nigeria. It also excludes community-based perspectives, focusing instead on institutional and corporate viewpoints through the lens of internal environmental management officers.

Review of Related Literature

Conceptual Review

Concept of Gas Flaring Activities

Gas flaring is the combustion of associated gas released during oil extraction, often practiced in oil-producing regions lacking sufficient gas capture infrastructure. In Nigeria, flaring has remained a persistent environmental and energy management challenge despite legal restrictions (Aigbedion et al., 2020). It reflects both infrastructural inadequacy and regulatory failure. This activity leads to the loss of valuable energy resources and undermines the global effort toward carbon emission reduction.

Gas Flaring Mitigation

Gas flaring mitigation refers to the deliberate strategies employed to minimize or eliminate the routine burning of associated gas during oil extraction. These include technological upgrades, policy reforms, economic incentives, and infrastructure development aimed at capturing and utilizing flared gas (Ismail & Umukoro, 2017). Such interventions are critical for reducing greenhouse gas emissions and improving energy sustainability in oil-producing nations where flaring remains prevalent due to weak regulatory compliance.

Environmental Degradation

Environmental degradation refers to the decline in environmental quality caused by human and natural activities that harm the ecosystem's ability to support life. This process includes deforestation, pollution, land degradation, and loss of biodiversity (Okoye & Mbata, 2020). Rapid urbanization and resource exploitation contribute to habitat

loss and the breakdown of ecological balance, particularly in developing nations where regulatory frameworks are weak. These pressures diminish resilience against climate change and public health threats.

Sustainability of Oil and Gas Firms

Sustainability in oil and gas firms refers to the integration of environmental, social, and economic considerations into corporate strategies to ensure long-term value creation and risk management. This includes reducing carbon emissions, engaging communities, and ensuring ethical resource extraction (Okonkwo & Ibanga, 2022). Companies adopting sustainability frameworks are more resilient to regulatory shifts, global climate pressures, and fluctuating commodity prices, especially within volatile regions like sub-Saharan Africa.

Environmental sustainability remains a major challenge in the oil and gas sector. Firms are under pressure to reduce flaring, adopt cleaner technologies, and rehabilitate degraded sites. Implementing sustainable practices not only helps preserve ecosystems but also aligns firms with international emissions agreements such as the Paris Accord (Ekong & Ojobo, 2020). Sustainable operational adjustments, including energy-efficient refining and methane recovery, are increasingly becoming indicators of environmental compliance in upstream and downstream operations.

Regulatory Framework

A regulatory framework refers to the set of rules, institutions, policies, and mechanisms established by a government or authority to control, monitor, and guide specific sectors or activities. These frameworks aim to ensure order, protect public interest, and promote fairness and accountability in various domains including finance, energy, and the environment. Effective regulatory systems create predictable environments that encourage investment and ensure responsible corporate behaviour (Kolo & Anigbogu, 2021).

In the energy and environmental sectors, regulatory frameworks are essential for governing resource use and emissions. For instance, oil-producing countries enforce laws to curb gas flaring, protect biodiversity, and promote sustainable development (Irefin & Sulaimon, 2019). These regulations often include permit systems, penalties, and emission caps designed to limit environmental degradation. However, weak enforcement and institutional fragmentation frequently undermine their effectiveness, particularly in low- and middle-income countries.

Good regulatory frameworks exhibit clarity, consistency, and adaptability. They must respond to technological changes, market evolution, and global environmental standards. Countries that periodically review and update their regulations tend to attract more foreign investment and improve institutional credibility (Olomu & Ikenna, 2023). Conversely, ambiguous or outdated rules create loopholes that businesses may exploit, reducing compliance incentives and weakening regulatory authority. Thus, continuous reform is central to maintaining regulatory relevance.

The role of regulatory agencies is equally critical. Independent oversight bodies are needed to implement frameworks fairly and transparently. Their responsibilities include monitoring, enforcement, licensing, and stakeholder engagement (Aluko & Udoh, 2018). When these institutions lack resources or are politicized, regulatory

failure becomes imminent. Strengthening their capacity, ensuring autonomy, and investing in digital monitoring systems can improve performance and accountability in complex sectors like oil and gas.

Moreso, the success of a regulatory framework depends on stakeholder collaboration, rule of law, and public participation. Involving civil society and affected communities' increases compliance and legitimacy. Effective frameworks are those embedded in transparent legal systems, supported by competent institutions, and backed by clear enforcement protocols. The synergy of legal robustness and operational capacity determines how well regulations function in practice and influence sectoral sustainability.

Theoretical Review

The study was theoretically underpinned on Stakeholder Theory propounded by Edward Freeman in 1984 and supported by Legitimacy Theory by Suchman in 1995.

Stakeholder Theory

Stakeholder Theory, first introduced by Edward Freeman in 1984, posits that an organization's success is not solely dependent on maximizing shareholder value but on effectively managing relationships with all stakeholders—individuals or groups who are affected by or can affect the company's operations. These stakeholders include employees, customers, suppliers, government regulators, investors, local communities, and even the natural environment. The theory argues that organizations have ethical and strategic obligations to consider the interests, welfare, and input of all these parties in decision-making processes.

Relevance of the Study

- i. The theory supports the argument that oil and gas firms have a moral obligation to protect the environment and reduce harmful practices like gas flaring, not just to avoid sanctions but to serve broader societal interests.
- ii. Gas flaring negatively impacts host communities in the Niger Delta. Stakeholder Theory reinforces the importance of involving these communities in decision-making and addressing their concerns to maintain social license to operate.
- iii. The theory aligns with sustainability principles by emphasizing that corporate strategies should balance economic goals with social and environmental responsibilities.
- iv. Responsiveness to stakeholder expectations builds trust and goodwill. Applying this theory helps explain how minimizing gas flaring can improve firms' public image and stakeholder confidence.
- v. It acknowledges that governments and environmental regulators are key stakeholders. Firms that neglect these actors risk legal penalties and operational disruptions.

Legitimacy Theory

Legitimacy Theory was propounded by Suchman in 1995. It is rooted in the idea that organizations exist and operate within a broader social context and must conform to the norms, values, and expectations of the societies in which

they function. The theory posits that legitimacy is a generalized perception or assumption that an organization's actions are desirable, proper, or appropriate within the socially constructed system of norms and beliefs.

According to the theory, corporate survival and success are closely tied to public acceptance. This acceptance, or “social license to operate,” depends on whether the organization's activities are viewed as responsible, ethical, and aligned with community and environmental standards. When there is a disconnect—such as when firms engage in harmful practices like persistent gas flaring—they risk losing legitimacy. This can trigger negative consequences including reputational damage, legal sanctions, community resistance, and reduced investor confidence.

Legitimacy Theory is particularly relevant in sectors that are environmentally sensitive and publicly scrutinized, such as the oil and gas industry. In the context of the Niger Delta, where communities are acutely affected by pollution and environmental degradation, oil companies must actively work to maintain legitimacy through sustainable practices, transparent communication, and compliance with environmental regulations.

Relevance of Legitimacy Theory to the Study

i. Legitimacy Theory provides a basis for understanding why oil and gas firms must comply with environmental laws, such as the Associated Gas Re-Injection Act and the Petroleum Industry Act. Regulatory compliance becomes not just a legal requirement but a strategic necessity to preserve legitimacy.

ii. The theory underscores the impact of public opinion. Continuous gas flaring in the Niger Delta has led to widespread community resentment and media criticism. Firms that fail to address these issues risk being seen as socially irresponsible, which can lead to protest actions, litigation, or loss of government support.

iii. As a strategy to maintain or regain legitimacy, firms often increase their environmental disclosures, adopt corporate social responsibility (CSR) initiatives, and commit to global standards such as the United Nations Sustainable Development Goals (SDGs). These efforts help to reshape public perception and signal alignment with societal values.

iv. Firms that operate in line with public expectations are more likely to enjoy long-term stability. Legitimacy helps attract and retain investors, reduce regulatory scrutiny, and build positive relationships with host communities—all of which are crucial for the sustainability of oil and gas operations in the Niger Delta.

By integrating Stakeholder Theory and Legitimacy Theory, this study adopts a multidimensional theoretical framework that captures both the ethical obligations and strategic motivations behind corporate environmental behavior. Together, these theories help explain how gas flaring impacts the sustainability, public image, regulatory standing, and long-term operational performance of oil and gas firms in the Niger Delta.

Empirical Review

Seiyaboh and Izah (2017) evaluated the impact of gas flaring on vegetation and water bodies in the Niger Delta. Through field sampling and laboratory analysis of soil and water near flare sites, they found increased

concentrations of heavy metals, sulphates, and acidifying agents. These pollutants significantly reduced soil fertility and plant productivity, threatening ecological balance.

Uyigue and Enujekwu (2017) examined the physicochemical effects of gas flaring on host environments. They analyzed soil, water, and air samples from communities at varying distances from flare points. Results revealed acid rain formation, heavy metal contamination, and crop damage, especially in areas closest to flare sites. These environmental alterations pose sustainability risks for oil-producing regions.

Akuirene, Adjene, Obi, and Nwose (2019) studied the environmental health effects of gas flaring in Ubeji, Delta State. Using community surveys, they compared health conditions across different proximities to flaring zones. Findings showed significantly higher respiratory illnesses among residents living closer to flares, indicating a clear link between exposure to emissions and declining public health.

Nwadiogor and Akujuru (2020) assessed the effects of gas flaring on human health in Ogba/Egbema/Ndoni LGA. Combining household surveys and environmental data, they identified elevated levels of harmful gases like CO, SO₂, and PM. These pollutants were associated with increased respiratory issues and poor well-being, highlighting weak regulatory enforcement and declining community trust in oil firms.

Dienye, Ikwuemesi, Akankali and Olopade (2023) investigated aquatic degradation due to gas flaring in the Niger Delta. Water samples near flare points were analyzed for pH, temperature, and heavy metal content. The study revealed toxic concentrations, thermal pollution, and reduced aquatic biodiversity, especially in fishing communities, undermining local livelihoods and the sustainability of oil operations.

Emekwuru (2024) analyzed the lifecycle stages at which gas flaring occurs in oil production. Using a design-focused case study approach, the research showed that flare intensity is highest during early production and full operation. Findings emphasized that early-stage intervention is most cost-effective, and delaying mitigation worsens environmental harm, necessitating targeted flare reduction policies.

Gap in the Literature

A number of empirical studies have explored the environmental and health impacts of gas flaring in the Niger Delta. For instance, Seiyaboh and Izah (2017) and Uyigue and Enujekwu (2017) assessed how gas flaring affects soil, water, and air quality, while Akuirene et al. (2019) and Nwadiogor and Akujuru (2020) examined the health consequences on local populations. These studies have provided strong evidence linking gas flaring to environmental degradation and adverse health outcomes in host communities.

However, few studies have investigated the broader implications of gas flaring on the long-term sustainability and operational performance of oil and gas firms themselves. The majority of existing research tends to focus on environmental science or public health dimensions without connecting these outcomes to corporate sustainability, regulatory compliance, or stakeholder relations. There is also limited empirical evidence assessing how regulatory frameworks—such as the Petroleum Industry Act—affect firms' flaring behavior and sustainability strategies.

Additionally, most studies adopt a community-based perspective, with less attention paid to internal actors like environmental compliance officers, whose insights are crucial in evaluating how firms manage environmental risks. Furthermore, there is a noticeable lack of studies that integrate theoretical frameworks—such as Stakeholder Theory and Legitimacy Theory—to explain corporate responses to gas flaring and sustainability challenges.

This study addresses these gaps by examining the relationship between gas flaring and the sustainability of oil and gas firms in the Niger Delta, focusing on the perspectives of internal compliance officers. It also evaluates the effectiveness of regulatory mechanisms and adopts a dual-theory approach to better understand the strategic and ethical dimensions of corporate environmental behavior.

Methodology

Research Design

This study adopted the survey research design, which enabled the researcher to obtain relevant data directly from selected respondents through structured questionnaires and guided interviews. The survey method facilitated the gathering of both quantitative and qualitative data required to examine the effect of gas flaring on the sustainability of oil and gas firms in the Niger Delta.

Area of Study

This research was conducted in the Niger Delta region of Nigeria, which is recognized as the hub of the country's oil and gas exploration and production activities. The Niger Delta comprises nine states: Abia, Akwalbom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo, and Rivers. These states are located in the southern part of Nigeria and are bounded by the Atlantic Ocean to the south, which enhances their strategic importance in offshore oil operations.

Geographically, the region covers an estimated 70,000 square kilometers, characterized by extensive river networks, mangrove swamps, tropical rainforests, and low-lying terrain. The area is crisscrossed by numerous tributaries of the Niger River, leading into the Atlantic Ocean through the Gulf of Guinea. The region's rich hydrocarbon deposits have made it a focal point of Nigeria's oil and gas sector, accounting for over 80% of national oil output.

However, the geographical features that make the Niger Delta resource-rich also render it environmentally fragile. The abundance of rivers and wetlands makes the region highly susceptible to pollution from gas flaring, oil spills, and other industrial activities. These ecological vulnerabilities, combined with dense population centers and economically dependent communities, amplify the region's exposure to the negative effects of gas flaring, such as air pollution, acid rain, and loss of biodiversity.

Therefore, the Niger Delta provides a relevant and critical context for studying the intersection of gas flaring practices and the sustainability of oil and gas firms, given its economic significance and environmental sensitivity.

Population of the Study

The population comprised 580 environmental compliance officers working in licensed oil and gas companies across the Niger Delta. These officers were selected because of their specialized roles in monitoring environmental standards and sustainability initiatives within their respective firms.

Sample Size Determination

The Taro Yamane formula was used to determine the appropriate sample size from the population of 580 officers, using a 5% margin of error:

$$n = \frac{N}{1+N(e)^2}$$

Where:

n = sample size

N = population size (580)

e = level of precision (0.05)

$$n = \frac{580}{1+580(0.05)^2}$$

$$n = \frac{580}{1+1.45}$$

$$n = \frac{580}{2.45}$$

$$n = \mathbf{237}$$

Thus, the sample size for the study was **237** respondents.

Sampling Technique

A stratified random sampling technique was employed to ensure fair representation of officers from different oil and gas firms in the region. The strata were based on company size and departmental classification, and samples were drawn proportionately to the number of officers in each stratum.

Instrument for Data Collection

A structured questionnaire served as the main instrument for data collection. It included closed-ended items arranged under key variables such as gas flaring frequency, environmental impact, regulatory compliance, and sustainability practices. Additionally, semi-structured interviews were conducted with selected officers to gather richer contextual data.

Validity of the Instrument

To ensure validity, the questionnaire was reviewed by two university researchers with expertise in environmental studies and by one industry expert. Their feedback informed revisions that improved the relevance and clarity of the instrument's content.

Reliability of the Instrument

The reliability of the instrument was tested through a pilot study involving 30 respondents from a different oil firm not included in the main study. The reliability coefficient obtained using Cronbach's Alpha was 0.82, which indicated a high level of internal consistency.

Method of Data Collection

Data collection was carried out over a four-week period. The questionnaire was distributed and retrieved manually by trained field assistants. In addition, interviews were conducted face-to-face and through virtual meetings with selected respondents, allowing for clarification and deeper insight.

Method of Data Analysis

The data collected were analyzed using descriptive statistics, including frequencies and percentages, which were presented in frequency tables. This method was used to summarize and interpret response trends concerning the perceived impact of gas flaring on the sustainability of oil and gas firms.

Data Presentation and Analysis

Data Presentation and Analysis

Table 1: How often do gas flaring activities occur in your firm's operational area?

Options/Responses	Frequency (n = 237)	Percentage (%)
Daily	92	38.8%
Weekly	58	24.5%
Monthly	38	16.0%
Rarely	31	13.1%
Never	18	7.6%

Source: Field Survey, 2025

This table illustrates the respondents' views on the frequency of gas flaring activities in their firm's operational area. A considerable portion of respondents (38.8%) reported that gas flaring occurs daily, suggesting it is a deeply entrenched activity in the region. Additionally, 24.5% of respondents stated that flaring happens weekly, while 16.0% identified monthly flaring. A smaller segment, 13.1%, claimed it occurs rarely, and only 7.6% reported that it never happens. These findings suggest that gas flaring is still prevalent in most operational zones of oil and gas firms

in the Niger Delta, indicating a sustained environmental challenge that could affect both ecological integrity and sustainable development targets in the region.

Table 2: In your opinion, how severe is the environmental degradation (e.g., air pollution, vegetation loss, acid rain) caused by gas flaring in your area?

Options/Responses	Frequency (n = 237)	Percentage (%)
Very severe	81	34.2%
Severe	69	29.1%
Moderate	45	19.0%
Mild	28	11.8%
Not noticeable	14	5.9%

Source: Field Survey, 2025

This table presents respondents’ perceptions of the severity of environmental degradation caused by gas flaring in their local areas. A majority of respondents considered the impact to be either very severe (34.2%) or severe (29.1%), indicating that over 63% of the participants believed the environmental effects of gas flaring were serious. Another 19.0% viewed the impact as moderate, while 11.8% assessed it as mild. Only 5.9% reported that degradation due to gas flaring was not noticeable in their surroundings. These findings reinforce the perception that gas flaring significantly contributes to environmental harm in the Niger Delta, supporting concerns about the ecological sustainability of continued flaring operations.

Table 3: How has gas flaring affected your firm’s ability to meet its long-term sustainability goals (e.g., environmental targets, community relations, investor trust)?

Options/Responses	Frequency (n = 237)	Percentage (%)
Very negatively	74	31.2%
Negatively	66	27.8%
No significant impact	49	20.7%
Positively	31	13.1%
Very positively	17	7.2%

Source: Field Survey, 2025

This table outlines respondents’ views on the effect of gas flaring on their firm’s ability to achieve long-term sustainability goals. A combined 59.0% of participants indicated that gas flaring had either a very negative or negative impact on sustainability outcomes, particularly concerning environmental compliance, investor confidence, and stakeholder trust. Meanwhile, 20.7% stated there was no significant impact, suggesting some level of neutrality or adaptive mitigation within certain firms. A smaller group—13.1% and 7.2%, respectively—believed gas flaring had a positive or very positive effect, which may reflect differing operational contexts or interpretations. Overall, the responses emphasize that gas flaring is widely perceived as a barrier to long-term sustainable development within oil and gas firms operating in the Niger Delta.

Table 4: What is the impact of gas flaring on the operational cost and performance of your firm?

Options/Responses	Frequency (n = 237)	Percentage (%)
Very high impact	69	29.1%
High impact	61	25.7%
Moderate impact	51	21.5%
Low impact	34	14.3%
No impact	22	9.3%

Source: Field Survey, 2025

This table captures the perceived impact of gas flaring on firms’ operational costs and performance. According to the responses, 29.1% of participants indicated that the impact is very high, while another 25.7% reported a high impact. Together, this means that over half (54.8%) of the respondents believed that gas flaring significantly increases operational challenges, possibly through regulatory penalties, community disruptions, or reduced operational efficiency. Additionally, 21.5% considered the impact moderate, while 14.3% believed it was low. Only 9.3% of respondents saw no impact. These results suggest that gas flaring is not only an environmental concern but also a financial and performance-related issue for oil and gas firms in the Niger Delta.

Table 5: How effective are the current government policies and regulations in reducing gas flaring practices in your firm?

Options/Responses	Frequency (n = 237)	Percentage (%)
Very effective	34	14.3%
Effective	47	19.8%
Neutral	58	24.5%
Ineffective	61	25.7%
Very ineffective	37	15.6%

Source: Field Survey, 2025

This table presents respondents’ assessments of the effectiveness of current government policies and regulations aimed at curbing gas flaring within their firms. A total of 34.1% of respondents rated these policies as either effective or very effective, suggesting some level of policy influence in certain areas or among compliant firms. However, a larger portion—41.3%—described the regulations as either ineffective or very ineffective, pointing to perceived enforcement gaps, regulatory inconsistencies, or limited deterrent effects. Meanwhile, 24.5% held a neutral view, which may reflect uncertainty or mixed experiences regarding policy outcomes. The data reflect a prevailing sentiment that, while regulatory frameworks exist, their effectiveness in mitigating gas flaring remains questionable among many stakeholders in the Niger Delta oil and gas sector.

Table 6: How strictly does your firm comply with gas flaring regulations enforced by government agencies (e.g., NUPRC, NESREA)?

Options/Responses	Frequency (n = 237)	Percentage (%)
Full compliance	41	17.3%
High compliance	63	26.6%
Moderate compliance	59	24.9%
Low compliance	46	19.4%
No compliance	28	11.8%

Source: Field Survey, 2025

This table reveals respondents’ perceptions of their firms’ level of compliance with gas flaring regulations enforced by government bodies such as NUPRC and NESREA. A combined 43.9% of respondents indicated full or high compliance, suggesting that some firms are aligning with regulatory expectations either due to internal policies or fear of sanctions. However, 24.9% reported only moderate compliance, while another 31.2% admitted to low or no compliance at all. These results reflect a divided regulatory climate in which some firms attempt adherence while others appear to operate with limited enforcement or oversight. The data imply the need for stronger regulatory monitoring and enforcement mechanisms to ensure widespread and consistent compliance across the oil and gas sector in the Niger Delta.

Summary of findings, conclusion and recommendations.

Summary of Findings

The following summarizes the key findings:

- i. Findings revealed that gas flaring remains a routine activity in most oil and gas firms operating in the Niger Delta, with 63.3% of respondents indicating daily or weekly occurrences. Furthermore, 63.3% believed the environmental degradation caused by flaring is either severe or very severe. This underscores the continuous threat posed by gas flaring to air quality, soil fertility, and ecological balance in host communities.
- ii. Majority of respondents (59.0%) reported that gas flaring negatively affects their firms’ ability to meet long-term sustainability goals such as environmental compliance and stakeholder trust. Similarly, 54.8% indicated that gas flaring imposes a high or very high impact on operational costs and performance. These results suggest that gas flaring undermines both environmental responsibility and economic efficiency in the oil and gas sector.
- iii. The study showed mixed perceptions regarding regulatory effectiveness. While 34.1% considered existing policies effective, a higher proportion (41.3%) rated them as ineffective or very ineffective. Compliance levels also varied, with only 43.9% acknowledging full or high compliance, and 31.2% admitting to low or no compliance. These findings point to weak regulatory enforcement and inconsistent adherence among firms, limiting the success of gas flaring mitigation frameworks.

Conclusion

The findings from this study provide critical insights into the persistent challenge of gas flaring and its implications for the sustainability of oil and gas firms in the Niger Delta. The results demonstrated that gas flaring remains a widespread operational practice, occurring daily or weekly in many firms, and is widely perceived as a major driver of environmental degradation in the region. Respondents reported severe effects on air quality, ecosystem health, and local communities, raising serious sustainability concerns.

Moreover, gas flaring was found to negatively impact firms' long-term sustainability strategies and operational performance. The high frequency and intensity of flaring activities were linked to increased operational costs, reputational risks, and difficulties in meeting environmental commitments. These factors undermine the sector's ability to align with global sustainability standards and investor expectations.

Recommendations

Based on the findings of this study, the following recommendations are proposed:

- i. Government agencies such as the Nigerian Upstream Petroleum Regulatory Commission (NUPRC) and the National Environmental Standards and Regulations Enforcement Agency (NESREA) should intensify enforcement of gas flaring policies through regular audits, stricter penalties, and real-time monitoring technologies. This would compel non-compliant firms to adopt safer, more sustainable practices.
- ii. Oil and gas firms should be encouraged—through fiscal incentives and public-private partnerships—to invest in gas capture and conversion technologies. Utilizing flared gas for electricity, domestic use, or industrial input can reduce environmental degradation and improve operational efficiency while supporting national energy needs.
- iii. Stakeholder engagement should be enhanced by involving host communities in environmental monitoring and sustainability reporting. Creating public dashboards and third-party verification systems can promote accountability, build trust, and ensure that both firms and regulators are responsive to environmental and social concerns in affected areas.

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