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Policy-Practice Gap in Nigeria's Upstream Petroleum Environmental Governance: Evidence from Regulatory Effectiveness, Environmental Outcomes and Reporting Systems

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ABSTRACT

Nigeria has one of the most elaborate environmental governance frameworks in Africa's petroleum sector, built on the Petroleum Industry Act (PIA) 2021, the National Oil Spill Detection and Response Agency (NOSDRA) Act, and the Upstream Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (UEGASPIN). Yet despite this regulatory architecture, oil spills, gas flaring, ecosystem degradation and community grievances persist across the upstream petroleum industry. This study examines the policy-practice gap in Nigeria's upstream petroleum environmental governance using a convergent mixed-methods approach that draws on survey data (n = 142), documentary analysis, and environmental performance records. The analysis combines descriptive statistics, reliability analysis (Cronbach's alpha), Pearson correlation, and one-way ANOVA with thematic analysis and triangulation of secondary datasets. The findings reveal a clear disconnect between policy design and implementation: legislative clarity scored 3.92/5.00, while enforcement consistency reached only 3.20/5.00; a measurable governance gap. Environmental outcomes posted the lowest overall score (2.96/5.00), and reporting transparency exposed striking divisions between stakeholder groups (industry: 3.76 vs. community: 2.43; $F = 53.59$, $p < 0.001$). The paper concludes that Nigeria's environmental governance system is formally sophisticated but operationally weak, and traces the policy-practice gap to three interconnected deficits: enforcement, reporting integrity, and institutional capacity.

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INTRODUCTION

Nigeria's upstream petroleum sector sits at the heart of its economy, driving government revenue, foreign exchange earnings, and export income. Since commercial oil production began at Oloibiri in 1956, petroleum has defined the country's economic path. But that same industry has left a long trail of environmental harm, and governance of those consequences, particularly in the Niger Delta remains deeply contested (Watts, 2022; Obi, 2022; Akujobi, 2023).

Oil spills, gas flaring, contaminated groundwater, ecosystem collapse, biodiversity loss, and serious public health risks are everyday realities for communities living near petroleum operations (UNEP, 2022; Okonkwo and Nnaji, 2023; Zabbey and Ordinioha, 2022). Nigeria has responded with a raft of environmental legislation and regulatory bodies designed to enforce accountability. Key instruments include the Petroleum Industry Act (2021), the National Oil Spill Detection and Response Agency Act (2006), and the Upstream Environmental Guidelines and Standards for the Petroleum Industry in Nigeria (UEGASPIN).

Despite these reforms, the evidence of environmental deterioration continues to mount. This contradiction poses a pointed governance question: why does an extensive body of environmental law consistently fail to deliver better environmental outcomes? This paper approaches that question through the concept of the policy-practice gap, the distance between

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environmental policies as written and as actually implemented (Biermann and Pattberg, 2022; Hanberger, 2022). It assesses how wide that gap is in Nigeria's upstream petroleum sector and traces the institutional factors that keep it open.

LITERATURE REVIEW

Environmental Governance and the Policy-Practice Gap

Environmental governance refers to the full web of institutions, legal frameworks, processes, and actors that shape how environmental decisions are made and carried out (Biermann and Pattberg, 2022; Gupta et al., 2022). Sound legislation is only part of what makes it work; effective governance also demands implementation capacity, enforcement mechanisms, monitoring systems, transparency, and accountability (Cox et al., 2022; Koontz and Newig, 2022; Baird et al., 2022).

Research across resource-dependent economies shows that environmental governance tends to break down not because of poor policy design, but because of weak implementation (Peters, 2023; Kaufmann and Kraay, 2023; Scott, 2022). Fragmented regulation, under-enforced rules, political interference, inadequate funding, and thin monitoring capacity are all recurring culprits (Mol et al., 2022; Spaargaren, 2022; Addison et al., 2022; Le Billon and Good, 2022). The policy-practice gap has emerged as a central concept in this literature, capturing the situations where policies look solid on paper but consistently fall short in practice (Carroll et al., 2022; Moore et al., 2022; Turner and Ledwith, 2022).

Environmental Governance in Nigeria's Petroleum Sector

Nigeria's environmental governance involves a constellation of bodies, the Nigerian Upstream Petroleum Regulatory Commission (NUPRC), the National Oil Spill Detection and Response Agency (NOSDRA), the Federal Ministry of Environment, and the Hydrocarbon Pollution Remediation Project (HYPREP). Each carries a statutory mandate for environmental oversight, yet their overlapping jurisdictions and fragmented responsibilities have repeatedly been identified as obstacles to effective regulation (Ihua and Ajayi, 2023; Ikelegbe and Umukoro, 2022; Akhigbe-Mudueku, 2022; Okoro et al., 2022; Okonkwo and Udenwagu, 2023).

The environmental record of Nigeria's upstream sector is well-documented and troubling. Amnesty International (2022) recorded ongoing violations, while the UNEP (2022) Ogoniland remediation report found that progress has been far too slow. Obi-Iyeke and Omoruyi (2023) point to regulatory capture as a structural explanation for weak enforcement, a finding consistent with Human Rights Watch (2023), Idemudia and Amaeshi (2022), and Ogele and Ezirim (2022), all of whom examine how governance failures, corporate behaviour, and community harm intersect. Sovacool et al. (2022) situate this within the broader human and financial costs of upstream energy accidents, while Chukwu and Obiora (2023) and Nwankwo and Ogbonna (2022) trace the specific environmental damage pathways; gas flaring and hydrological disruption; that lie at the core of the Niger Delta's governance crisis.

Reporting Systems and Transparency

Environmental reporting is a cornerstone of governance accountability, connecting regulatory oversight to verifiable outcomes (GRI, 2023; IPIECA, 2024; EITI, 2023). In practice, however, reporting quality in extractive industries is routinely undermined by information asymmetries, selective disclosure, and conflicts of interest between operators and affected communities (Loh et al., 2022; Idemudia and Amaeshi, 2022; Human Rights Watch, 2023; NEITI, 2024). The European Commission's (2023) Corporate Sustainability Reporting Directive and the IPCC's (2022) sectoral emissions guidance reflect growing institutional pressure for mandatory, independently verifiable reporting; an acknowledgement that voluntary frameworks are insufficient on their own. Gupta et al. (2022) offer a theoretical lens for understanding how such transparency deficits ripple through governance systems in extractive industries.

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THEORETICAL FRAMEWORK

This study draws on two complementary theoretical traditions: Process Evaluation Theory (Carroll et al., 2022; Moore et al., 2022; Rossi et al., 2022; Mertens and Wilson, 2024) and Institutional Governance Theory (Peters, 2023; Scott, 2022; Cox et al., 2022). Process Evaluation Theory centres on implementation fidelity; asking whether policies are actually being executed as designed. Institutional Governance Theory focuses on how institutional arrangements, enforcement structures, and regulatory capacity determine outcomes. Used together, these frameworks offer a robust foundation for analysing where and why Nigeria's environmental governance system falls short of its stated objectives.

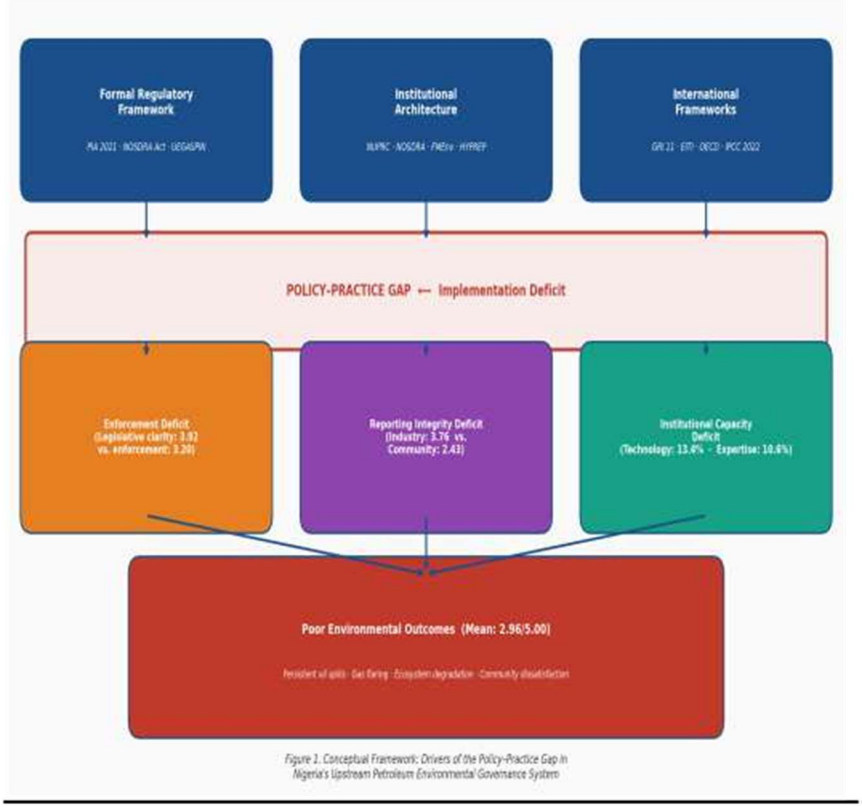


Figure 1. Conceptual Framework: Drivers of the Policy-Practice Gap in Nigeria's Upstream Petroleum Environmental Governance System

METHODOLOGY

The study used a convergent parallel mixed-methods design (Creswell and Creswell, 2022), collecting quantitative and qualitative data simultaneously and integrating them during analysis. This approach was chosen because fully understanding Nigeria's governance performance required both numerical measurement and deeper interpretive insight into institutional dynamics.

Primary data came from 142 respondents across four stakeholder groups (see Table 1). The sample skews heavily toward seasoned practitioners: 89.5% had 11 or more years of professional experience, and 86.6% reported high or very high involvement in environmental monitoring. This gives the findings strong practitioner credibility (Survey data, 2025).

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Table 1. Sample Profile by Stakeholder Group (n = 142)

Stakeholder Group	n	% of Sample	Role
Regulatory Agency (NOSDRA, NUPRC, FMEnv & SMEnv)	46	32.4%	Environmental oversight, permitting, enforcement
Oil & Gas Operating Companies (IOC / National / Independent)	42	29.6%	Upstream operators; E&P licence holders
Host Community Representative / Civil Society Organisation	32	22.5%	Affected communities and advocacy groups
Other Private Sector (CNA and Others)	22	15.5%	Consultants, auditors, legal practitioners
Total	**142**	**100%**	

Secondary data were drawn from the NOSDRA Oil Spill Monitor (NOSDRA, 2022), the World Bank Gas Flare Tracker, NOAA VIIRS satellite records, the World Bank GGFR database (World Bank, 2022), corporate sustainability reports of oil companies operating in the upstream petroleum sector, and relevant regulatory legislation.

The survey instrument included 42 Likert-scale items (1 = Strongly Disagree, 5 = Strongly Agree) and five open-ended questions. From these, three composite thematic scales were constructed: Regulatory Effectiveness (5 items), Environmental Outcomes (4 items), and Reporting Quality and Transparency (8 items).

Quantitative analysis involved: (i) descriptive statistics (means and standard deviations); (ii) reliability analysis (Cronbach's alpha) to assess each scale's internal consistency; (iii) Pearson correlation to explore relationships between themes; and (iv) one-way ANOVA to test for meaningful differences across stakeholder groups. Qualitative responses were analysed thematically, with systematic coding used to surface recurring governance concerns (Survey data, 2025).

RESULTS AND DISCUSSION

Cronbach's alpha was calculated for each of the three thematic scales; the full results appear in Table 2. All three scales showed good-to-excellent internal consistency (alpha ≥ 0.78), confirming that the items within each theme are measuring the same underlying construct reliably. Regulatory Effectiveness returned the highest score (M = 3.40, alpha = 0.783), Environmental Outcomes the lowest (M = 2.96, alpha = 0.798), and Reporting Quality and Transparency fell in between (M = 3.29, alpha = 0.828).

Table 2. Reliability Analysis: Cronbach's Alpha by Thematic Scale

Theme / Scale	Items	Mean (/5)	SD	Cronbach's α	Reliability Rating
Regulatory Effectiveness	5	3.40	0.73	0.783	Good
Environmental Outcomes	4	2.96	0.72	0.798	Good
Reporting Quality & Transparency	8	3.29	0.67	0.828	Good–Excellent

Note: alpha >= 0.70 = Acceptable; alpha >= 0.80 = Good; alpha >= 0.90 = Excellent (Creswell and Creswell, 2022).

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Pearson correlation analysis explored the relationships among the three governance themes, with results presented in Table 3. All three inter-theme correlations were statistically significant at $p < 0.001$. The tightest relationship was between Regulatory Effectiveness and Reporting Quality ($r = 0.796$), followed by Reporting Quality and Environmental Outcomes ($r = 0.745$), then Regulatory Effectiveness and Environmental Outcomes ($r = 0.669$). These strong positive correlations suggest that governance quality operates as an interconnected system rather than a set of independent institutional functions (Survey data, 2025). Respondents who see weak regulation tend to see poor environmental outcomes and opaque reporting in the same breath, reinforcing the case for integrated rather than piecemeal reform.

Table 3. Pearson Correlation Matrix: Inter-Theme Relationships

Theme	Regulatory Eff.	Environmental Out.	Reporting Quality
Regulatory Effectiveness	1.000	0.669***	0.796***
Environmental Outcomes	0.669***	1.000	0.745***
Reporting Quality & Transparency	0.796***	0.745***	1.000

*** *p < 0.001 (two-tailed). All inter-theme correlations are statistically significant at the 0.001 level.*

One-way ANOVA tested whether perceived governance quality differed across stakeholder groups, with results in Table 4. Statistically significant differences emerged on all three theme scores ($p < 0.001$). Host Community/CSO respondents rated every governance dimension 0.7–1.3 points below their industry counterparts. The starkest divergence was on Reporting Quality ($F = 53.59$, $p < 0.001$): industry rated it at 3.76 while communities gave it just 2.43; a 1.33-point gap. The pattern is telling: those with the most direct exposure to environmental impacts have the least faith in reporting transparency, pointing directly to the need for robust independent verification mechanisms (Survey data, 2025; EITI, 2023; European Commission, 2023).

Table 4. One-Way ANOVA: Governance Theme Scores by Stakeholder Group

Stakeholder Group	Regulatory Eff. (M)	Environmental Out. (M)	Reporting Quality (M)	Overall (M)
Oil & Gas Operating Companies	3.75	3.34	3.76	3.62
Other Private Sector	3.49	3.19	3.44	3.37
Regulatory Agency	3.57	2.97	3.37	3.30
Host Community / CSO	2.66	2.30	2.43	2.46
ANOVA F-statistic	**F = 21.67*** **	**F = 18.44*** **	**F = 53.59*** **	**p < 0.001**

*** *p < 0.001. M = Group mean score on 1-5 Likert scale. All F-statistics significant at the 0.001 level.*

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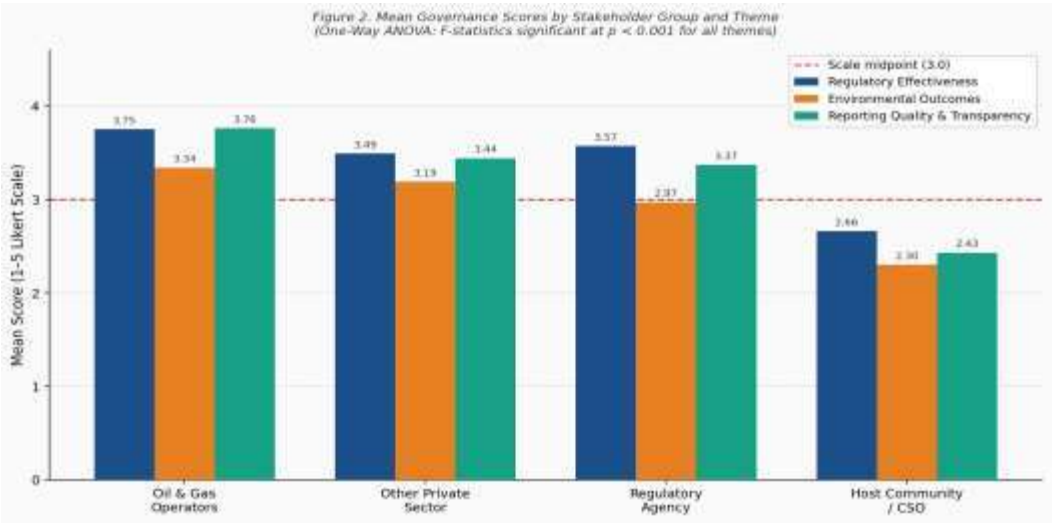


Table 5 sets out the item-level statistics for the Regulatory Effectiveness scale. Legislative clarity came in highest (M = 3.92, SD = 0.85), reflecting wide agreement that Nigeria does have relatively comprehensive environmental laws. Enforcement consistency, however, scored considerably lower (M = 3.20, SD = 1.05). That 0.72-point gap is quantitative evidence of exactly the kind of policy-practice disconnect documented by Ihua and Ajayi (2023), Obi-Iyeke and Omoruyi (2023), and Okoro et al. (2021).

Table 5. Item-Level Descriptive Statistics: Regulatory Effectiveness Scale

Survey Item	Mean (/5)	SD
Laws & regulations (PIA 2021, NOSDRA Act) are clear & comprehensive	3.92	0.85
Environmental policies aligned with economic/energy development goals	3.49	0.81
Oil companies are held accountable for violations	3.39	1.08
Effective coordination between NUPRC, NOSDRA & FMEnv	3.27	1.08
Communities & CSOs meaningfully involved in decision-making	3.23	0.94
Environmental laws consistently enforced for all companies	3.20	1.05

Table 6 shows the item-level statistics for the Environmental Outcomes scale. The two lowest scores were for environmental quality improvement in communities (M = 2.62, SD = 0.86) and gas flaring reduction (M = 2.71, SD = 0.97), both below the scale midpoint. These results confirm that formal regulatory reforms have not produced meaningful environmental improvements on the ground, a finding consistent with NOSDRA's (2022, 2024) records of persistent spill trends, World Bank (2022, 2024) flaring and governance data, and Zabbey and Ordinioha (2022) on ongoing Niger Delta ecosystem degradation.

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Table 6. Item-Level Descriptive Statistics: Environmental Outcomes Scale

Survey Item	Mean (/5)	SD
Oil spills have decreased over the past five years	3.04	0.99
Gas flaring & emissions significantly reduced	2.71	0.97
Air, water & soil quality improved in oil-producing communities	2.62	0.86

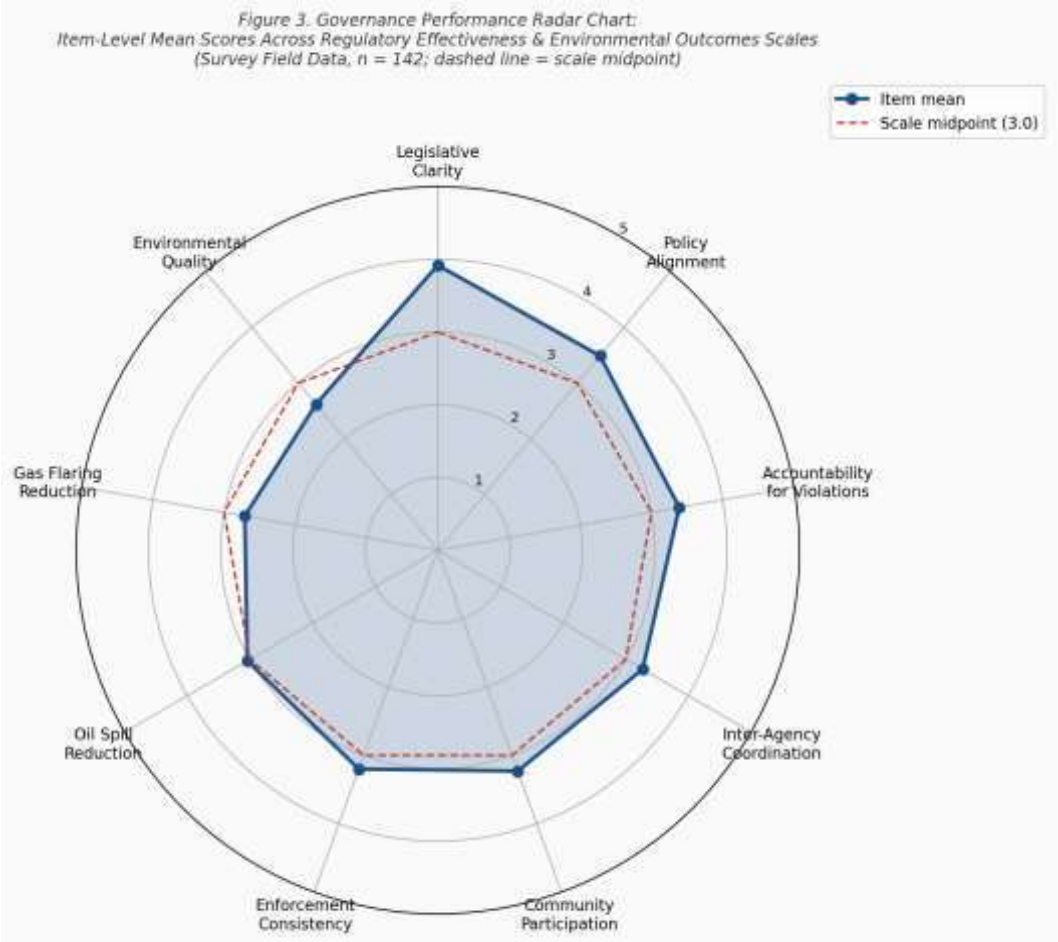
Table 7 covers the item-level statistics for the Reporting Quality and Transparency scale, with scores ranging from 3.11 to 3.54. The item on the gap between reported and actual incidents (reverse-coded) scored 3.35, reflecting widespread acknowledgement that under-reporting is a systemic problem. The lowest score within the theme went to comprehensive public reporting (M = 3.11), in line with the European Commission's (2023) and EITI's (2023) calls for mandatory disclosure standards. Capacity-related findings were particularly striking: only 13.4% of respondents believed agencies have adequate monitoring technology, and only 10.6% believed they have sufficient expertise for effective enforcement (Survey data, 2025).

Table 7. Item-Level Descriptive Statistics: Reporting Quality and Transparency Scale

Survey Item	Mean (/5)	SD
Environmental reports follow international standards (e.g., GRI)	3.54	0.94
Incidents promptly reported to regulatory agencies	3.37	1.01
Significant gap between reported & actual incidents (reverse-coded)	3.35	1.10
Reporting system provides transparent compliance monitoring	3.28	0.98
Trust in accuracy & verifiability of environmental data	3.27	0.94
Reports accessible to the public & stakeholders	3.23	0.97
Reports accurately & comprehensively disclose impacts	3.16	1.04
Companies publish comprehensive environmental reports	3.11	0.92

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FINDINGS

Taken together, the quantitative and qualitative findings point to three interconnected structural deficiencies at the root of the policy-practice gap:

1. Enforcement Deficit: The 0.72-point gap between legislative clarity (M = 3.92) and enforcement consistency (M = 3.20), compounded by ANOVA-confirmed inter-group divergence, indicates that legal instruments are not systematically applied across all operators (Ihua and Ajayi, 2023; Obi-Iyeke and Omoruyi, 2023; Petroleum Industry Act, 2021; Olawuyi, 2022).
2. Reporting Integrity Deficit: The 1.33-point gap between industry (3.76) and community (2.43) perceptions of reporting quality, combined with the under-reporting item score (M = 3.35), indicates structural data integrity failures incompatible with effective accountability (Loh et al., 2022; EITI, 2023; GRI, 2023).
3. Institutional Capacity Deficit: Only 13.4% of respondents believed agencies possess adequate monitoring technology; only 10.6% believed agencies have sufficient expertise; the lowest-scoring items in the survey; confirming that governance failure is

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fundamentally a resource and capacity deficit (Survey data, 2025; IPIECA, 2024; IEA, 2023).

CONCLUSIONS

This study provides empirical grounding for what many practitioners already sense: Nigeria's upstream petroleum environmental governance system has a serious policy-practice gap. The regulatory framework is formally sophisticated, but implementation is persistently weak, and communities bear the consequences. The 0.72-point gap between legislative clarity and enforcement consistency, the stark F = 53.59 divergence on reporting transparency, and near-universal concerns about institutional capacity all point to a structural problem, not an incidental one.

This reinforces a key finding from the broader governance literature (Cox et al., 2022; Peters, 2023; Biermann and Pattberg, 2022; Kaufmann and Kraay, 2023; Nwapi, 2023): implementation capacity often matters more than policy design in determining real-world environmental performance. Future reform efforts should invest in enforcement capacity, independent reporting verification, technological modernisation, and genuine community participation and not simply add more legislation. The study has limitations: self-report bias and a cross-sectional design constrain causal inference. Future research using panel designs with satellite-validated environmental outcome data would significantly strengthen these conclusions.

POLICY RECOMMENDATIONS

Drawing on the three governance deficits identified above, and reflecting the broad reform consensus among respondents (Survey data, 2025), the following priority reforms are recommended:

1. Harmonisation of regulatory mandates among NUPRC, NOSDRA, and the Federal Ministry of Environment through a codified national enforcement framework with published Key Performance Indicators (Peters, 2023; EITI, 2023).
2. Establishment of an independent Environmental Monitoring and Enforcement Fund with ring-fenced, multi-year budgetary allocation insulated from political interference (IEA, 2023).
3. Mandatory integration of satellite-based environmental monitoring and IoT pipeline sensors, aggregated on a single publicly accessible real-time dashboard (IPIECA, 2024; World Bank, 2022).
4. Deployment of digital and blockchain-enabled incident reporting systems to prevent retrospective data manipulation and enable independent audit trails (GRI, 2023; European Commission, 2023).
5. Institutionalisation of formal community representation on Environmental Monitoring Committees at field and national levels, with guaranteed rights of access to incident data (Survey data, 2025; Zabbey and Ordinioha, 2022).
6. Introduction of stronger administrative penalties, including operating licence suspension for repeated non-compliance or false reporting, linked directly to licence renewal decisions (Petroleum Industry Act, 2021; Okoro et al., 2022).
7. Independent third-party environmental audits and mandatory public disclosure of Joint Investigation Visit (JIV) findings and remediation progress timelines (EITI, 2023; Amnesty International, 2022).
8. Adoption of international reporting frameworks including GRI 11, ISSB, and OGMP 2.0 standards, with regulatory verification requirements (GRI, 2023; IPIECA, 2024; European Commission, 2023).

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