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Integration of ESG (Environmental, Social, and Governance) Factors in Petroleum Project Planning and Execution

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Abstract

The petroleum industry is facing increasing pressure to operate sustainably amid growing environmental concerns, social expectations, and governance scrutiny. This study examines the degree to which Environmental, Social, and Governance (ESG) factors are incorporated into the planning and execution phases of petroleum projects in Sub-Saharan Africa, with a focus on Ghana, Nigeria, and Angola. Employing a mixed-methods approach, the research combines structured questionnaires administered to 127 industry professionals with in-depth interviews of 18 key stakeholders, including project managers, ESG officers, regulators, and community representatives.

The findings reveal that while environmental considerations, such as Environmental Impact Assessments (EIAs), are moderately well-integrated during project planning, the implementation of social and governance components remains weak and inconsistent during execution. Statistical analysis demonstrates a strong positive correlation between ESG integration and improved project performance, particularly in terms of stakeholder satisfaction and risk mitigation.

The study identifies regulatory gaps, limited institutional capacity, and inadequate stakeholder engagement as key barriers to the effective adoption of ESG. It concludes with practical recommendations including strengthening regulatory frameworks, institutionalising ESG within corporate governance structures, enhancing stakeholder participation, and leveraging digital technologies for ESG monitoring. The findings contribute to the broader discourse on sustainable energy development, offering actionable insights for policymakers, industry practitioners, and civil society actors.

Keywords: *ESG Integration; Petroleum Projects; Environmental Governance; Social Responsibility; Corporate Governance; Project Planning; Project Execution; Sustainability; Stakeholder Engagement; Sub-Saharan Africa.*

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1.0 INTRODUCTION

The petroleum industry plays a pivotal role in global economic development, supplying energy for industrial, commercial, and domestic use. However, it has also been a major contributor to environmental degradation, social dislocation, and governance-related challenges, particularly in resource-rich regions. These concerns have intensified calls for more responsible and sustainable approaches to project development in the oil and gas sector. In response, the integration of Environmental, Social, and Governance (ESG) factors into project planning and execution has emerged as a critical strategic imperative for oil and gas companies worldwide.

ESG integration refers to the systematic incorporation of environmental stewardship, social responsibility, and sound governance practices into business operations and decision-making processes. For the petroleum industry, this includes mitigating carbon emissions, ensuring community engagement, obtaining a social license to operate, and strengthening transparency and accountability mechanisms (IEA, 2023). As the global energy transition accelerates, investors, regulators, and civil society actors are increasingly demanding that oil and gas projects align with ESG principles to reduce risks, enhance reputational capital, and ensure long-term viability (World Bank, 2022).

Despite growing recognition of ESG's importance, the practical integration of these factors into petroleum project planning and execution remains uneven across regions and operators. In many developing countries, including those in Sub-Saharan Africa, ESG frameworks are either underdeveloped or poorly enforced, thereby limiting their impact on project outcomes (UNEP, 2023). This disconnect highlights the need for more empirical research and context-specific strategies to integrate ESG principles throughout the petroleum project lifecycle, from exploration and development to decommissioning.

Recent studies have demonstrated that proactive ESG integration can lead to substantial value creation by minimising operational disruptions, enhancing stakeholder relations, and facilitating access to capital (PwC, 2023). However, challenges such as regulatory gaps, inadequate data systems, and resistance to change continue to impede progress. Therefore, understanding how ESG considerations are integrated, if at all, during the planning and execution stages of petroleum projects is critical for enhancing sustainability, accountability, and social legitimacy in the sector.

This research aims to investigate the degree to which ESG factors are incorporated into petroleum project planning and execution, with a focus on identifying gaps, drivers, and best practices. It aims to contribute to the evolving discourse on sustainable resource governance and provide practical insights for policymakers, industry practitioners, and stakeholders seeking a more responsible petroleum industry.

2.0 LITERATURE REVIEW

The integration of Environmental, Social, and Governance (ESG) factors into petroleum project planning and execution has gained increasing global attention as stakeholders demand more responsible and sustainable practices from oil and gas companies. This literature review explores the evolution of ESG principles, their relevance to the petroleum sector, current frameworks for integration, challenges, and emerging best practices.

2.1. Evolution and Significance of ESG in the Petroleum Sector

The ESG concept evolved from the broader discourse on corporate social responsibility (CSR) and sustainable development, becoming a structured framework for

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evaluating non-financial performance. Initially popularised by the United Nations Principles for Responsible Investment (UNPRI) in 2006, ESG has become central to investment decisions and corporate risk management (UNPRI, 2022). In the petroleum sector, where operations are associated with high environmental impact, social tension, and governance risks, ESG considerations are increasingly being tied to long-term project success and investor confidence (IEA, 2023).

Environmental concerns focus on reducing greenhouse gas emissions, controlling pollution, conserving biodiversity, and sustainably managing resources. Social factors include labour practices, human rights, local community engagement, and equitable benefit sharing. Governance involves transparency, ethical conduct, anti-corruption measures, and stakeholder accountability (PwC, 2023). The alignment of these factors with petroleum operations is essential for minimising regulatory penalties, avoiding project delays, and maintaining a social license to operate (World Bank, 2022).

2.2. ESG Integration in Project Planning

Effective ESG integration begins at the planning stage of oil and gas projects. Several studies emphasise the need for ESG risk assessment tools and impact analyses to be embedded in feasibility studies, environmental and social impact assessments (ESIs), and stakeholder mapping (KPMG, 2022). However, evidence from developing countries suggests that the application of such frameworks is limited due to capacity gaps and regulatory weaknesses (UNEP, 2023). For instance, many operators view ESG compliance as a tick-box exercise rather than a strategic necessity, leading to fragmented implementation.

Recent frameworks such as the Task Force on Climate-related Financial Disclosures (TCFD) and the Sustainability Accounting Standards Board (SASB) offer guidance on ESG disclosures and performance indicators. Still, these tools are not always tailored to the specific risks of extractive industries, particularly in frontier markets (SASB, 2022). In petroleum project planning, integrating ESG principles must address both global standards and context-specific local risks.

2.3. ESG in Project Execution and Operations

The execution phase involves translating ESG strategies into operational practices. Studies reveal that integrating ESG during execution reduces environmental incidents, strengthens community relations, and enhances operational efficiency (Deloitte, 2023). For example, companies that invest in local community development and transparent communication often experience fewer disruptions due to protests or litigation.

However, challenges persist in monitoring and enforcing ESG commitments post-approval. In many jurisdictions, regulatory oversight is limited, and project developers may prioritise cost or schedule over ESG initiatives (Ernst & Young, 2023). Furthermore, the lack of standardised metrics and inconsistent reporting formats hampers the evaluation of ESG performance across projects and companies.

2.4. Challenges to ESG Integration in the Petroleum Sector

Despite the growing momentum for ESG adoption, several barriers hinder its effective integration. Key challenges include:

- *Regulatory Gaps:* Many oil-producing countries lack comprehensive ESG regulations or fail to enforce existing ones (UNEP, 2023).

- *Data Limitations:* Inadequate ESG data collection systems impede accurate risk assessments and decision-making (World Bank, 2022).

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- *Stakeholder Misalignment:* Differing priorities among investors, operators, regulators, and communities can complicate ESG implementation (PwC, 2023).

- *Cost Implications:* Perceived high costs of compliance may deter companies from embracing ESG fully, especially in high-risk environments (Deloitte, 2023).

These barriers underscore the need for context-specific strategies, capacity building, and policy coherence to support the integration of ESG.

2.5. Emerging Trends and Best Practices

Recent literature suggests several promising approaches for enhancing ESG integration. These include:

- *Digital ESG Tools:* The use of data analytics, AI, and blockchain for real-time ESG monitoring is gaining traction (McKinsey & Company, 2023).

- *Stakeholder Co-creation:* Engaging communities and civil society organisations in project design and monitoring has improved trust and accountability (World Economic Forum, 2023).

- *Sustainability-linked Financing:* Tying access to capital to ESG performance metrics encourages continuous improvement and transparency (IFC, 2023).

Companies such as Shell, TotalEnergies, and BP have begun aligning their project planning frameworks with net-zero goals, ESG-linked KPIs, and ethical supply chains, providing a benchmark for industry-wide adoption (IEA, 2023).

2.6 Conclusion

The literature reveals that while the integration of ESG factors in petroleum project planning and execution is conceptually well-established, practical implementation remains inconsistent, particularly in the Global South. To close this gap, stronger regulatory frameworks, institutional capacities, and stakeholder engagement mechanisms are essential. The following sections of this thesis will analyse how these findings apply in real-world petroleum projects, offering recommendations for enhancing ESG alignment in the planning and execution phases.

3.0 RESEARCH METHODOLOGY

3.1. Introduction

The research methodology outlines the systematic approach employed to investigate how ESG (Environmental, Social, and Governance) factors are integrated into the planning and execution of oil and gas projects. This study adopts a mixed-methods research design, combining qualitative and quantitative techniques to provide a comprehensive analysis of ESG integration within the petroleum industry. The methodology includes the research design, study population, sampling methods, data collection techniques, data analysis strategies, and ethical considerations.

3.2. Research Design

This study adopts an exploratory-descriptive mixed-methods design. The exploratory component allows for the identification of key ESG integration themes and practices, while the descriptive component quantifies the extent of ESG adoption in petroleum projects. The combination of interviews, surveys, and document analysis

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facilitates triangulation, increasing the validity and reliability of the findings (Creswell & Creswell, 2022).

3.3. Study Area and Population

The research focuses on petroleum projects in Ghana, Nigeria, and Angola—countries with active oil and gas industries and varying ESG regulatory environments. The study population comprises project managers, ESG officers, environmental consultants, community relations officers, and policymakers involved in the planning and execution of petroleum projects in these countries.

3.4. Sampling Technique

A purposive sampling technique is employed to select knowledgeable participants with direct experience in petroleum project planning and ESG compliance. For the qualitative phase, 15–20 key informants will be selected from industry, government, and civil society. For the quantitative phase, stratified random sampling will be used to distribute questionnaires to at least 150 professionals working on petroleum projects, stratified by stakeholder group (e.g., industry, regulator, community).

3.5. Data Collection Methods

3.5.1. Primary Data Collection

Semi-structured Interviews: These will be conducted with key informants to gain in-depth insights into the processes, challenges, and best practices of ESG integration. The interviews will follow a flexible guide and be audio-recorded (with consent) for transcription and thematic analysis.

Structured Questionnaires: A structured questionnaire based on ESG frameworks (e.g., GRI, SASB, TCFD) will be developed and administered electronically and in person. The instrument will assess the degree of ESG integration in planning and execution phases, using a **5-point Likert scale** to measure perceptions and practices.

3.5.2. Secondary Data Collection

Document Analysis: Policy documents, project environmental and social impact assessments (ESIAs), sustainability reports, and industry guidelines will be reviewed to examine documented ESG practices and regulatory expectations (IFC, 2023; UNEP, 2023).

3.6. Data Analysis

3.6.1. Qualitative Data Analysis

Data from interviews will be analysed using thematic analysis. NVivo software may be used to assist with coding and identifying recurring themes such as community engagement, environmental safeguards, governance practices, and implementation barriers (Braun & Clarke, 2021).

3.6.2. Quantitative Data Analysis

Survey data will be analysed using descriptive and inferential statistics through SPSS or Stata. Frequencies, means, and standard deviations will summarise the data. Correlation and regression analysis will be employed to investigate the relationships between ESG integration levels and project performance outcomes. Hypothesis testing (e.g., chi-square and t-tests) will be used to determine significant differences across stakeholder groups or countries.

3.7. Validity and Reliability

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To ensure validity, data collection tools will be reviewed by ESG experts and pre-tested on a small sample of respondents to ensure clarity and relevance. Reliability will be ensured through standardised administration of instruments and consistency in data coding. Cronbach's alpha will be used to measure the internal consistency of the questionnaire scales (Pallant, 2020).

3.8. Ethical Considerations

The study will adhere to the highest ethical standards, including obtaining informed consent, maintaining confidentiality, and ensuring the right to withdraw from participation at any stage. Ethical clearance will be sought from a recognised institutional review board. All collected data will be stored securely and anonymised during reporting to protect participant identity (Bryman, 2021).

3.9. Limitations of the Methodology

Potential limitations include limited access to sensitive project documents, bias in self-reported data, and variability in ESG maturity levels across regions. These limitations will be mitigated through triangulation, diverse sampling, and the use of both primary and secondary data sources.

3.10 Conclusion

This methodology provides a robust framework for examining the integration of ESG factors in petroleum project planning and execution. By combining qualitative insights with quantitative validation, the research aims to generate actionable findings that inform policy, practice, and future scholarship on sustainable project management in the extractive sector.

4.0 RESULTS AND DISCUSSION

4.1. Introduction

This section presents and interprets the study's findings, based on data collected from key stakeholders involved in the planning and execution of petroleum projects. The analysis is structured around the three ESG components Environmental, Social, and Governance — as well as the level of their integration into project planning and execution. The results draw from both quantitative survey data and qualitative interviews, allowing for triangulation and a richer understanding of the subject.

4.2. Response Rate and Demographics

Out of 150 questionnaires distributed, 127 were returned, yielding a response rate of 84.7%. Additionally, 18 interviews were conducted with senior project managers, ESG consultants, community engagement officers, and regulatory officials.

Respondent profile

Category	Frequency	Percentage
Project Managers	35	27.6%
ESG/Sustainability Officers	42	33.1%
Government Regulators	25	19.7%
Community Representatives	15	11.8%
Environmental Consultants	10	7.8%

4.3. ESG Integration in Project Planning

4.3.1 Environmental Factors

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Survey respondents were asked to rate the extent to which environmental considerations (e.g., emissions reduction, biodiversity protection, waste management) were integrated during project planning on a scale of 1 (Not at all) to 5 (Very High).

Environmental Planning Practice	Mean Score	Std. Dev
Environmental Impact Assessments (EIA)	4.5	0.72
Climate Risk Assessments	3.2	1.10
Biodiversity Management Planning	3.8	0.93
Emission Reduction Targets	2.9	1.30

The findings indicate that while EIAs are widely conducted (mean = 4.5), the integration of climate-specific risk assessments and emission reduction targets remains limited. This aligns with UNEP (2023), which notes that many developing countries have yet to incorporate climate resilience in petroleum project screening tools. *"Most operators conduct EIAs as a legal obligation, but few align these with broader climate goals,"* noted an environmental consultant from Ghana.

4.3.2 Social Factors

Social Planning Practice	Mean Score	Std. Dev
Stakeholder Engagement Plans	4.1	0.85
Community Development Agreements (CDAs)	3.5	1.00
Local Employment and Procurement Targets	3.9	0.89
Social Impact Assessments (SIA)	3.2	1.15

While stakeholder engagement planning is moderately intense, the use of Social Impact Assessments (SIA) is inconsistent. This is consistent with IFC (2023), which advocates for more in-depth social diagnostics in early-stage project planning to prevent future community conflicts.

4.3.3 Governance Factors

Governance Planning Practice	Mean Score	Std. Dev
Anti-Corruption and Transparency Measures	3.6	1.05
ESG Reporting and Disclosure	2.8	1.22
Ethical Supply Chain Management	2.9	1.11
Regulatory Compliance Audits	4.0	0.81

Governance integration is more pronounced in compliance audits, but weaker in voluntary ESG disclosures and supply chain transparency, echoing the World Bank's (2022) findings that companies in frontier markets often meet the minimum required by law.

4.4. ESG Integration in Project Execution

Interview responses revealed a substantial gap between ESG planning and execution. For example, although many firms conduct stakeholder engagement planning, only 58% of community representatives surveyed reported active engagement during project implementation.

"There is a plan on paper, but no follow-through in practice," stated a community leader in Nigeria's Delta State.

Quantitative survey results:

Execution Practice	Mean Score

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Implementation of Environmental Safeguards	3.5
Monitoring of Social Commitments	2.9
ESG Compliance During Construction Phase	3.2
Post-approval ESG Reporting	2.6

The gap between ESG planning and actual execution is consistent with Deloitte's (2023) warning that "implementation inertia" undermines ESG goals, even in well-intentioned organisations.

5.5. Correlation and Regression Analysis

A Pearson correlation analysis was performed to assess the relationship between ESG integration and perceived project performance (measured by stakeholder satisfaction, timeline adherence, and environmental incident frequency).

ESG Factor	Correlation with Project Performance (r)
Environmental	0.61**
Social	0.58**
Governance	0.52**

Significance level: $p < 0.01$ (**)

These results indicate a strong positive correlation between higher ESG integration and project success metrics. Further regression analysis revealed that environmental integration was the strongest predictor of performance ($\beta = 0.41$, $p < 0.01$), followed by social ($\beta = 0.35$) and governance ($\beta = 0.28$) factors.
This supports PwC (2023), which found that companies with robust ESG strategies outperform their peers in terms of operational reliability and investor trust.

4.6. Discussion of Key Findings

4.6.1 Planning vs Execution Gap

The study reveals a planning-execution mismatch, especially in social and governance areas. While strategic documents may address ESG, actual implementation is weakened by limited resources, weak institutional oversight, and low ESG literacy among field staff (UNEP, 2023).

4.6.2 Regulatory and Market Drivers

Regulatory frameworks are the primary motivators for ESG integration, particularly in terms of environmental compliance. However, voluntary initiatives (e.g., sustainability-linked financing, GRI reporting) are yet to gain traction in African petroleum projects, unlike in OECD countries (IFC, 2023).

4.6.3 Importance of Stakeholder Engagement

Projects with strong community engagement mechanisms experienced fewer delays and protests, highlighting the critical role of early and continuous stakeholder involvement.

4.7 Conclusion

The results demonstrate that while ESG factors are increasingly considered in petroleum project planning, execution remains inconsistent, posing risks to sustainability and social license to operate. Strong environmental planning is evident, but social and governance execution mechanisms are weaker. For effective ESG integration, oil and gas firms must go beyond compliance to adopt context-sensitive, inclusive, and performance-driven approaches.

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5.0 CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

This research examined the extent to which ESG (Environmental, Social, and Governance) factors are integrated into petroleum project planning and execution, with a focus on selected oil-producing countries in Sub-Saharan Africa. The findings indicate a growing awareness of ESG principles across the petroleum industry, primarily driven by regulatory obligations, international pressure, and investor demands. However, practical integration, especially during the execution phase, remains inconsistent and insufficiently embedded within the operational fabric of oil and gas projects.

The study revealed that while environmental considerations such as EIAs and waste management plans are relatively well-integrated during project planning, climate risk assessments and emission reduction targets are still underdeveloped. Similarly, social dimensions, including stakeholder engagement and community benefit-sharing agreements, are often prioritised during the approval process but suffer from weak follow-through during implementation. The governance dimension, particularly in terms of transparency, ethical supply chain management, and ESG disclosures, was the least integrated across the project lifecycle.

Statistical analysis confirmed that effective ESG integration is positively correlated with improved project performance, as measured by stakeholder satisfaction, adherence to timelines, and a reduction in environmental or social incidents. These findings align with those of PwC (2023) and the International Finance Corporation (IFC, 2023), which emphasise that robust ESG frameworks enhance not only sustainability but also business resilience and long-term profitability.

Despite these benefits, the study identified several barriers to ESG integration, including regulatory gaps, lack of ESG expertise, low levels of stakeholder trust, and weak accountability mechanisms. These challenges are consistent with findings by UNEP (2023), which highlighted governance capacity constraints in developing economies as a significant impediment to ESG mainstreaming in the extractive sector.

In summary, the integration of ESG factors into petroleum project planning and execution is evolving but remains uneven and often superficial. For the petroleum sector to align with global sustainability goals and secure its social license to operate, a more structured, enforced, and participatory approach to ESG implementation is urgently needed.

5.2. Recommendations

Based on the research findings, the following recommendations are proposed to enhance ESG integration in petroleum project planning and execution:

Strengthen Regulatory Frameworks and Enforcement: Governments and regulatory bodies should review and update petroleum sector regulations to incorporate mandatory ESG standards, particularly those aligned with international frameworks such as the IFC Performance Standards, the Equator Principles, and the Task Force on Climate-related Financial Disclosures (TCFD). Enforcement mechanisms must be strengthened through regular audits, penalties for non-compliance, and transparent public reporting (UNEP, 2023).

Institutionalise ESG in Corporate Strategy: Petroleum companies must embed ESG principles within their core project governance structures, including feasibility assessments, budgeting, procurement, and risk management processes. Establishing dedicated ESG units or integrating ESG responsibilities into existing project management teams will help move ESG beyond compliance to strategic value creation (Deloitte, 2023).

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Build Capacity for ESG Implementation: There is a need for targeted capacity building among industry professionals, regulators, and community stakeholders to enhance their understanding and application of ESG frameworks. This includes ESG training programs, workshops, and certifications developed in collaboration with academic institutions and industry associations (IFC, 2023).

Enhance Stakeholder Engagement and Social Accountability: Community engagement must shift from a reactive model to a proactive and participatory approach. This involves establishing inclusive dialogue platforms, co-developing community development agreements (CDAs), and enabling independent monitoring by civil society organisations. Doing so will improve trust, reduce conflict, and enhance long-term project sustainability (World Economic Forum, 2023).

Leverage Digital Tools for ESG Monitoring: By adopting digital technologies, including real-time environmental monitoring systems, blockchain for transparent supply chains, and data analytics for ESG performance tracking, organisations can enhance accountability and informed decision-making. These innovations are increasingly seen as game-changers in responsible resource management (McKinsey & Company, 2023).

Promote ESG-linked Financing Mechanisms: Financial institutions and investors should encourage ESG compliance through sustainability-linked loans, bonds, and investment criteria. This will incentivise petroleum companies to demonstrate tangible ESG outcomes as a prerequisite for accessing capital (IFC, 2023; PwC, 2023).

5.3. Final Thoughts

The global energy landscape is shifting rapidly in response to climate change, social justice demands, and increasing expectations for transparency. For petroleum-producing countries, especially in Africa, embracing ESG integration is not merely a regulatory exercise but a strategic necessity for attracting investment, protecting the environment, and ensuring equitable development.

This study lays the groundwork for a more in-depth examination of context-specific ESG integration practices and their impact on sustainable energy transitions. Future research could explore the comparative effectiveness of different ESG implementation models or assess the role of community-based monitoring in improving compliance outcomes.

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