



**Mainstreaming Strategic Thinking in Policy Making for new Oil
and Gas Frontiers in Nigeria through a transition to Strategic
Environmental Assessment**

**A thesis submitted to Newcastle University in fulfilment of the
Degree of Doctor of Philosophy**

by

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ABSTRACT

Despite more than six decades of oil and gas exploration and production in Nigeria's old frontier basin areas in the Niger Delta region, the Nigerian government enacted the 2021 Petroleum Industry Act (PIA), which outlines an ambitious plan to expand oil and gas development into new frontier basin fields that possess significant hydrocarbon resource potential. To date, decisions about energy development are predominantly made based on a project-by-project basis through Environmental Impact Assessment (EIA), and often not within a longer-term policy-planning and strategic context that could help design and guide policy and decision-making for sustainable oil and gas development transition. This study explores the potential for mainstreaming a strategic thinking approach to planning and impact assessment in Nigeria's oil and gas policy sector through a Strategic Environmental Assessment (SEA) to help drive the decision process toward more sustainable outcomes. Informed by ideas from transition management theory, the study applied a mixed method of quantitative and qualitative approaches that included the administration of two survey questionnaires: one with communities who live in the oil and gas old frontier basin areas and one with EIA practitioners. In-depth semi-structured interviews were also conducted with policy-makers, regulators, industry, environmental non-governmental organisations, academics, local community leaders in the old and new frontier basin regions and representatives from the multilateral development organisations. The research findings reveal transition pathways in which a strategic thinking approach to Nigeria's oil and gas policy and plan-making can be mainstreamed through environmental assessment. It unearths well-founded rationales and potential critical decision factors that could enable a transition toward a more strategic approach to planning and environmental assessment. These include slow-changing landscape trends related to learning potential from the prevailing EIA practice in the old frontier of hydrocarbon exploration and development, the influence of the broader exogenous landscape factors such as sustainability consideration and climate change issues, coupled with the increasing demands for SEA implementation as a pre-condition for funding oil and gas development by the international multilateral and bilateral development agencies and the opportunity of a decision window provided by the PIA. The findings also identify potential barriers to the prospects of a transition toward a strategic approach in Nigeria's oil and gas industry, which include key features of the incumbent EIA regime that are characterised by unclear and rigid institutional and regulatory arrangements, value conflicts, disparate objectives, politics and power constellation, path-dependencies and lock-ins. The research concludes by proposing a transition-based EIA framework for Nigeria's oil and gas policy sector, which identifies pathways in which mainstreaming a strategic approach to planning and impact assessment can complement and enhance the efficacy of the existing project-level EIA and support the hydrocarbon development transitions in Nigeria's new frontier basin regions toward a sustainable outcome.

DEDICATION

This thesis is dedicated to the memory of my late father, **Alhaji Kyari Mangga**, who in his lifetime, held my hand and walked me down to a newly opened nursery school just a few meters from our family compound. He would have been proud to see this day. May Allah bless his soul, reward him with the highest rank of paradise and shower him with his boundless mercy. Ameen.

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ACRONYMS AND ABBREVIATIONS

AEIAN	Association of Environmental Impact Assessment of Nigeria
ASUU	Academic Staff Union of Universities
BET	Best Available Technology
BEIS	Business Energy and Industrial Strategy
BP	British Petroleum
CAQDAS	Computer-Aided Qualitative Data Analysis System
CBO	Community Base Organisation
CCME	Canadian Council of Ministers of the Environment
CEA	Cumulative Effect Assessment
CDF	Critical Decision Factor
CNOOC	China National Offshore Oil Corporation
C-NOPB	Canada-Newfoundland Offshore Petroleum Board
CO ₂	Carbon Dioxide
CNPC	China National Petroleum Corporation
C-NSOPB	Canada–Nova Scotia Offshore Petroleum Board
CSR	Corporate Social Responsibilities
CSO	Civil Society Organisations
DPR	Department of Petroleum Resources
DRC	Democratic Republic of Congo
DW	Decision Window
EER	Environmental Evaluation Report
EGASPIN	Environmental Guidelines and Standards for the Petroleum Industry in Nigeria
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EIA	Energy Information Administration
EIS	Environmental Impact Statement
EP	Equator Principle
EPFI	Equator Principle Financial Institutions
ESR	Environmental Screening Report

ENGO	Environmental Non-governmental
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
ESIA	Environmental and Social Impact Assessments
ESIM	Environmental Sensitivity Index Map
EU	European Union
EEZ	Exclsuive Econmic Zone
FDI	Foreign Direct Investment
FMND	Federal Minstry of Niger Delta
FME	Federal Ministry of Environment
FRN	Federal Republic of Nigeria
GDP	Gross Domestic Product
GHG	Greenhouse gases
HSE	Health Safety and Environment
IEE	Initial Environmental Examination
IMM	Impact Mitigation Monitoring
IMP	Integrated Management Plan
IOC	International oil companies
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
IR	International Relations
MDA	Multi-lateral Development Agencies
MEND	Movement for the Emancipation of Niger Delta
MLP	Multi-Level Perspectives
MMR	Mixed Method Research
MPR	Ministry of Petroleum Resources
MPE	Ministry of Petroleum and Energy
NACGOND	Nigerina Coalition for Oil and Gas in the Niger Delta
NCF	Nigerian Conservation Foundation
NESREA	National Environmental Standards and Regulations Enforcement Agency
NDDC	Niger Delta Development Commission

NNPC	Nigerian National Petroleum Company
NMDPRA	Nigerian Midstream and Downstream Petroleum Regulatory Authority
NIOC	National Iranian Oil Company
NOC	National Oil Companies
NOSDRA	National Oil Spill Detection and Response Agency
NPDC	Nigerian Petroleum Development Company
NSA	Non-State Actors
NUPRC	Nigerian Upstream Petroleum Regulatory Commission
PEIAR	Preliminary Environmental Impact Assessment Report
PEMEX	Petroleos Mexicanos
PIA	Petroleum Industry Act
PPP	Policies, Plans and Programmes
PPE	Personel Protective Equipment
PW	Produced Water
OECD	Organisation for Economic Co-operation and Development
ONGC	Oil and Natural Gas Corporation
OPEC	Organisation of Petroleum Exporting Countries
OPRC	Oil Pollution Preparedness, Response and Cooperation
SSSCE	Senior Secondary School Certificate Examination
SEA	Strategic Environmental Assessment
SEPA	State Environmental Protection Agency
TOR	Terms of Reference
UES	Uniform Effluent Standards
UK	United Kingdom
UNDP	United Nations Development Programme
US	United States
UNEP	United Nations Environment Programme
VEC	Value Ecosystem Component
WBG	World Bank Group
WP	Window of opportunity

CHAPTER ONE

Overview and context of the Research

1.0 Introduction

This chapter introduces the background and rationale for the study, followed by the presentation of the research aim and objectives. The chapter then provides an overview of the research methodological approach and concludes with the presentation of the overall structure of the thesis.

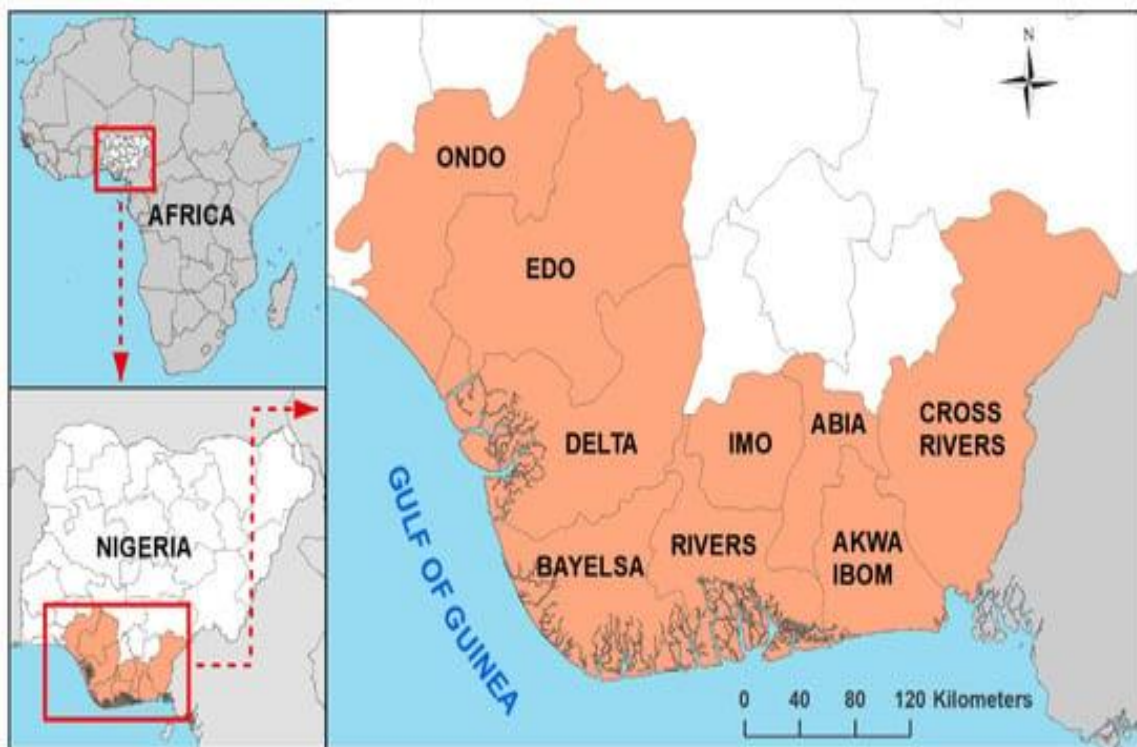
1.1 Background and rationale for the research study

The oil and gas industry has been a key strategic driver of world economic and social growth since the dawn of the second industrial revolution, which triggered a profound paradigm shift in human development, consumption and production patterns (Landes, 1973; Hook and Tang, 2013; Stevens, 2016; Mughal et al., 2022). With the global population projected to increase by two billion by the year 2050 (Food and Agriculture Organization of the United Nations, 2017) and underpinned by the prospects of accelerated industrialisation and technological development, the demand for fossil fuels, particularly oil and gas commodities—appears insatiable (Lu et al., 2019; Wang et al., 2023). This ever-increasing demand has sustained the appeal of potential and proven oil and gas reserves as a new energy frontier. This is evidenced by the intensity and spatial extent of hydrocarbon drilling and production activities taking place in several jurisdictions around the world—stretching from Africa, Australia, the Arctic nations, Southeast Asia, the Gulf of Mexico, the northern North Atlantic Ocean (Norwegian and United Kingdom waters), South America and India (Rotimi and Ngalawa, 2017; Cordes et al., 2016; Zuoqian et al., 2022). Within this context, Nigeria is in the midst of a critical transformation in its oil and gas development as exemplified by the growing interest in exploring the potential hydrocarbon deposits, which are beginning to hold a greater appeal as the new energy frontiers. As such, Nigeria is in a prime position to provide energy to an ever-increasing world population with increasing energy needs. Industrial exploitation of oil and gas reserves in Nigeria has occurred since 1903 (Steyn, 2009), with commercial production of crude oil beginning in 1958 in what is now considered the old frontier of energy in the Niger Delta region (See Figure 1.1). Since then, the importance of the oil and gas industry

to Nigeria's economy has been overwhelmingly undeniable; however, hydrocarbon extraction, production and operations have caused significant impacts on the ecological environment.

According to the United Nations Environment Programme (UNEP—2011), Nigeria's old frontier of energy in the Niger Delta area, where oil and gas exploration and development has been ongoing for over six decades, has become one of the world's most polluted delta regions (UNEP, 2011). Several studies conducted by Anifowose et al. (2012a), Zabbey et al. (2017), Onyancha et al. (2021a; 2021b) and Ukhurebor et al. (2023) have reported the activities of crude oil and natural gas extraction in the Niger Delta region have caused an inestimable range of degradation, biodiversity loss, displacement of human population and disruption of the socio-economic livelihoods of the local inhabitants in the area which more often presents complex sustainability challenges for decision-makers to grapple with.

Figure 1.1: Map of Africa showing Nigeria and the old frontier of oil and gas exploration and production in the Niger Delta region



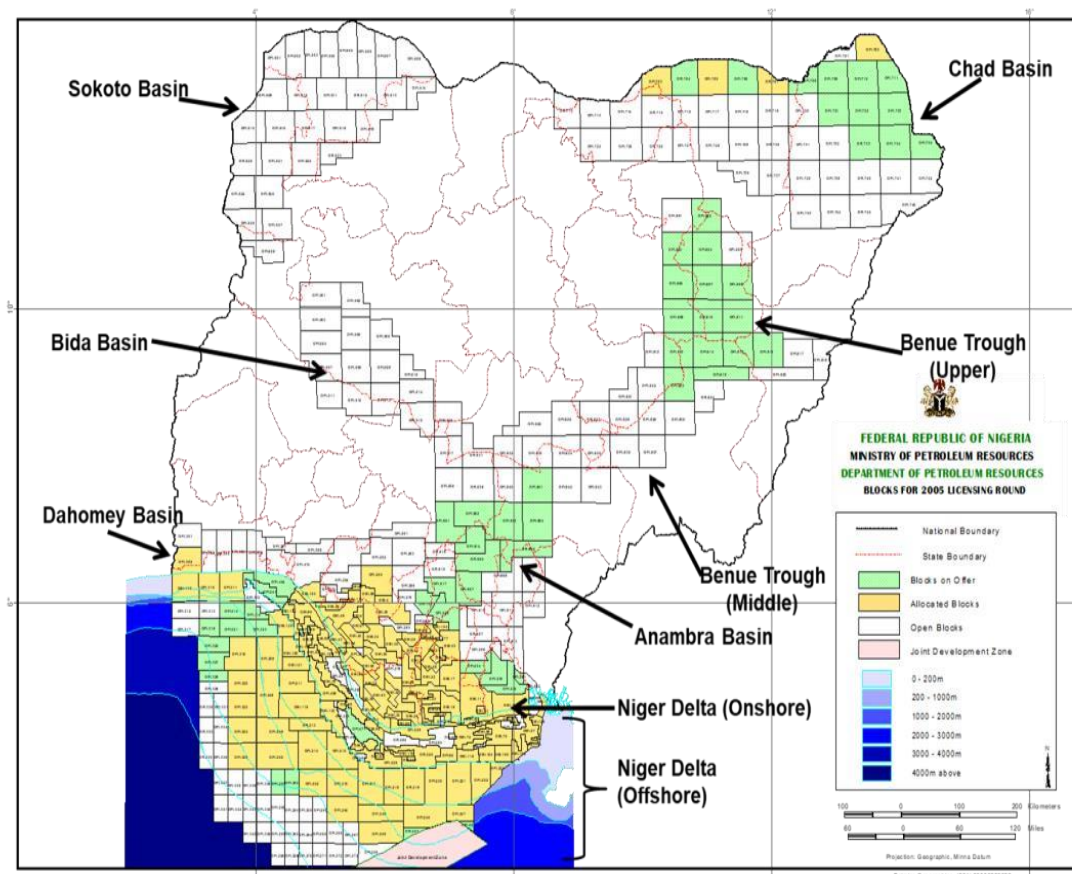
Source: Ebhuoma et al. (2020)

However, despite the environmental consequences of the hydrocarbon extraction and development in the old frontier of the Niger Delta region, the Nigerian government recently enacted the 2021 Petroleum Industry Act (PIA), which outlines an ambitious plan to expand energy development into new frontier basins that possess significant hydrocarbon resource potential. The PIA envisions opening up new frontier basins to potential hydrocarbon extraction and development to complement more than 93 per cent of the current crude oil production that comes from the Niger Delta region (Nigerian National Petroleum Company—NNPC, 2019; Habib and Xie, 2012; PIA, 2021). The new frontier basins comprise the Anambra Basin, Benue Trough, Bida Basin, Chad Basin, Dahomey Basin, Mid-Niger Basin, Sokoto Basin as well as the deep and ultra-deep offshore areas of the Niger Delta region (Adekoya et al., 2014; Obaje et al., 2022) (See Figure 1.2). The new frontiers are remarkably rich in hydrocarbon resources. Preliminary evaluation indicated that new frontier basins constitute a significant quantum of energy resource deposits, with a projected 75% natural gas and 25% crude oil in volumetric ratio (Obaje et al., 2004). In particular, the successful discovery of a commercial quantum of oil and gas in the Kolmani River-2 well in the Upper Benue Trough by the Nigerian National Oil Company stands as a classical attestation to the potentialities of the new energy frontiers (Obaje et al., 2022; NNPC, 2019). This remarkable discovery set the context for the Nigerian government to embark upon accelerated approval of licenses for hydrocarbon drilling activities in the Benue Trough basin.

However, while the renewed interest in opening new energy frontier to potential hydrocarbon exploration and development has triggered accelerated government attention, it also sparked long-standing concerns regarding Nigeria's preparedness to plan for a sustainable oil and gas development transition in the new frontier basins. Increasing concern regarding the planning and environmental management of the oil and gas development is particularly evident in the new frontier basin areas rich in hydrocarbon resources, considering the circumstances following oil and gas exploration and development in the old frontier of the Niger Delta region in retrospect (Ajiya, 2023). It is anticipated that the potential environmental consequences of oil and gas extraction and production activities in the new frontier basins will likely affect the socio-economic livelihoods of the local inhabitants living proximate to the areas (Ismail et al., 2021),

induce inestimable and long-term impacts on an ecologically sensitive environment and exacerbate uncertainties related to climate change.

Figure 1.2: Map of Nigeria showing new frontier basins of oil and gas resources



Source: Federal Ministry of Petroleum Resources

To date, however, decisions about oil and gas exploration and production in Nigeria and management of the impacts associated with such development are typically made on a project-by-project basis through the environmental impact assessment (EIA) regulatory regime. The EIA has been institutionalised in Nigeria through decree No. 86 of 1992, which provides the main cardinal principle underlying environmental management and protection (Federal Republic of Nigeria, 1992). The EIA act explicitly stipulates that the public or private sectors of the economy shall not undertake or embark on, or authorise projects or activities without a prior consideration of the effects on the environment. The oil and gas projects feature prominently amongst the types of development for which EIA must be carried out (Olokesusi, 1998; Ogunba, 2004; Nwafor et al., 2018). As a result, the EIA has become an established environmental planning and regulatory process by

which the potential environmental impacts of oil and gas project development can be identified, avoided, minimised or compensated in order to achieve sustainable development. The EIA provides the regulatory authorities with evidentiary information on how an ecological baseline condition in the Niger Delta region may change in response to oil and gas project development and activities before issuing exploration and production license permit to developers.

A major concern, however, is that although the project-driven EIA regulatory practice in the Nigerian petroleum industry has been ongoing for more than three decades (Ambituuni et al., 2014; Echefu and Akpofure, 2002), it is mainly useful in informing and improving decisions about individual oil and gas development projects. In part, this may be attributed to the fact that project-based EIA tends to be somewhat reactionary and narrow in focus, as well as implemented too late into the overall policy-planning and decision-making processes. This has often limited its ability to inform the choice of alternatives, address the cumulative and regional environmental impacts of multiple individual energy projects of the same type that are co-located in a particular area within the Niger Delta region in an earlier and more strategic manner rather than reacting to these issues in the context of individual project assessment and decisions (Ingelson and Nwapi, 2014; Anifowose et al., 2016; Fasina, 2016). Therefore, the EIA is often undertaken within a pre-determined policy environment to rationalise or justify predetermined oil and gas decisions and commitments already made at the strategic level of policies, plans and programmes (PPPs). To address the limitations of the current project-based EIA approach to planning for and assessing the impacts of energy development in Nigeria, there is a need to mainstream a more proactive, integrated and future-oriented decision-support tool known as strategic environmental assessment (SEA) into oil and gas policy-planning and decision-making process.

SEA was originally conceived and has been increasingly recognised and used in part to address the shortcomings of the traditional EIA procedure; and in part to help ensure the proactive consideration of environmental issues in higher-level strategy-making, including policies, plans and programme development initiatives (Thérivel and Partidário, 1996; Gazzola, 2006; Lobos and Partidário, 20014). SEA can function as an upstream

checking mechanism to help facilitate the assessment of the environmental impact of PPP development initiatives and their alternatives right at the formative stage of policy-planning and decision-making before decisions and actions are undertaken, thereby broadening the scope and opportunities to explore various developmental pathways while alternative futures and options for development are still widely open (Fundingsland Tetlow and Hanusch, 2012; Partidário, 2022). In this way, SEA can enable strategic thinking in the planning and environmental assessment in a more broad-based framework—offering a sound basis for long-term policy-planning within a strategic context to help drive the decision process toward a sustainable outcome (Noble and Gunn, 2009; Partidário, 2015). By proactively focusing on strategic PPP development initiatives, SEA can enable the mainstreaming of sustainability principles and criteria into the decision process, ensure that the potential effects of PPP are identified and the benefits of early environmental considerations cascade downward, resulting in more informed, efficient and focused project-level assessments and decisions (White and Noble, 2013; Therivel and González, 2021).

Therefore, in principle, the benefits of integrating early strategic thinking into upstream policy-planning and decision-making can enable the formulation of a well-thought-out development strategy and environmental management portfolio for a particular region endowed with energy resources (CCME, 2009) and, in turn, can help support the decision-makers to identify key strategies and priorities for future management and development from a broader sustainability perspective (Gunn and Noble, 2015; Fidler and Noble, 2012; Harriman Gunn and Noble, 2009).

A transition from managing individual energy development projects based on the traditional EIA system to a more strategic approach has begun to take root internationally in environmental management. European member states and North American countries rich in hydrocarbon resources have during the last two decades shown considerable interest and progress in mainstreaming a strategic approach in the context of hydrocarbon planning and development to ensure that the energy sector is developed in a more sustainable way. This has been evidenced in the application of SEA as part of policy-planning, regulation and development decision-making to decide where

and when to open new frontier basins to potential oil and gas drilling activities in Australia (Marsden, 2016), United States (Doelle et al., 2013), United Kingdom (Caddell, 2016), Canada (Noble et al., 2013; Kapoor et al., 2021), Norway (Hasle et al., 2009; Fidler and Noble, 2012) and Greenland—Denmark (Lamorgese et al., 2015).

Indeed, there are several plausible reasons why the transitions to a more strategic approach in environmental management practice in the energy sector have received considerable impetus in the developed economies. First, it is recognised that the environmental consequences of hydrocarbon exploration and development are far greater in scope and complexity than a traditional project-level EIA can address, particularly when achieving sustainable development is at stake. Second, there is an understanding of the necessity to address the environmental implications of oil and gas development early in the planning process, before key important decisions and policy commitments are taken and energy projects become a reality at the strategic level of policies and plans. The third factor is substantial political capital, along with a strong environmental governance, which has been instrumental in facilitating the transitions toward a strategic approach in the oil and gas industry (Fidler and Noble, 2012; Kapoor et al., 2021; Doelle et al., 2013; Caddell, 2016; Geißler et al., 2021).

However, while the trends towards a more strategic approach to environmental assessment, as well as the rationale and benefits for applying it in the context of oil and gas planning and development, has received considerable traction in several oil-producing countries in the developed economies, SEA remains largely an uncharted territory within the countries of the global south rich in hydrocarbon resources. In Africa, there is evidence that many oil-rich countries have not yet mainstreamed strategic EA approach into oil and gas policy-planning and decision-making processes to inform decisions about when and where to open new frontiers to potential hydrocarbon exploration and development regarding which potential frontiers are going to be explored for oil and gas (Foluke, 2012; Lamorgese et al., 2015) and are still largely reliance on the traditional EIA-based practice given the centrality to the now widely acknowledged overwhelming need for improved environmental performance in the petroleum industry.

Like many oil-rich resource countries in Africa, Nigeria has no SEA system for oil and gas planning, regulation and development (Fasina, 2016). Part of the challenge for transitioning toward a more strategic approach in the oil and gas sector is the dominance of the project-based environmental management practice, which has become "locked-in in the current EIA regime," i.e. the self-perpetuating inertia created by the EIA system, inhabiting the prospects to mainstream strategic thinking approach to development impact assessment and management. The current lock-in in environmental management practice based on the EIA regulatory regime from a confluence of various factors, including path dependency arising from political interests, disparate objectives, values conflicts and institutional and regulatory inertia, as well as the economies of scale enjoyed by the multi-national oil companies as well as the propensity to rely on past decisions to pre-determine what further steps may be taken in environmental management. Collectively, these elements reinforce the current status quo of EIA practices. Another common explanation for a continual reliance on project-based EIA regulatory practice in Nigeria is that a much greater understanding of what SEA is, its potential added value and realised benefits in the context of energy development assessment and decision-making has yet to be empirically investigated. Evidence in the scholarship literature reveals that the majority of research on environmental assessment in Nigeria, in general (Ogunba, 2004; Olokesusi, 1998; Adomokai and Sheate, 2004; Osuizugbo et al., 2024) and in the oil and gas sector in particular (Nerry and Akpofure, 2000; Ogunba, 2004; Fasina, 2016; Ingelson and Nwapi, 2014; Agha et al., 2002; Anifowose et al., 2016; Hembra and Phil-Eze, 2021), have focused on the EIA practice. Intriguingly, despite the lack of SEA system for oil and gas planning, regulation and development in the Niger Delta area, considering numerous environmental challenges in the region, none of the referenced authors have explored the potential to advance a strategic approach to help guide the policy-planning and decision-making process to plan for oil and gas development.

This drawback in the literature presents a compelling imperative to examine the prospects of mainstreaming strategic thinking into policy-planning and impact assessment through a transition to SEA, especially as energy development is looming in

the new frontier basins. This is important because continual reliance on a project-centric EIA regulatory approach with the potential outcome of a business-as-usual scenario, i.e. focusing on environmental improvement of individual projects akin to the current practice in the Niger Delta region, may likely imperil the prospect of achieving sustainable oil and gas development in the new frontier basin regions. Therefore, this study argues that the potential environmental issues that may be associated with hydrocarbon extraction and development in the new frontier basins need to be addressed at a higher level of policy-planning and decision-making processes, and environmental management and protection need to be built into overall strategic energy frameworks at a much earlier stage of conception to ensure sustainable oil and gas development in Nigeria. Exploring shifts or transitions toward a more strategic approach in the environmental management practice in the natural resources domain such as the oil and gas sector, however, requires an understanding of the complexities and dynamics of the sustainability transition process, particularly the relevant actors and networks involved, political and institutional structures, and the obstacles posed by path-dependent trajectories and lock-ins (Markard et al., 2012; Geels et al., 2017; Loorbach et al., 2017).

This research has adopted a transition theory as a theoretical framework to explore the prospects of how the trajectory of environmental management practice based on the current project-based EIA in Nigeria's oil and gas industry could be strategically shifted toward the SEA approach. Transition theory emerged over the recent decades in response to perceived path-dependencies and lock-ins in society hampering necessary transitions to a more sustainable (Markard et al., 2012; Rotmans et al., 2001; Köhler et al., 2017). In theory, the transition literature has categorised four distinct frameworks for comprehending transition processes. These frameworks include the multi-level perspective (MLP), strategic niche management (SNM), transition management (TM), technological innovation systems (TIS) and the techno-economic paradigm (TEP) (Geels, 2002; Smith et al., 2010; Bergek et al., 2015; Markard and Truffer, 2008; Hekkert et al., 2007; Geels and Schot, 2007). Although the TM is used to facilitate an orientation toward a long-term vision of sustainable development with short-term experiential learning to probe options and find pathways to realise the transition vision (Voß et al., 2009), the MLP is the widely embraced framework used to decipher or make sense of the dynamics

and complexities of transitions in a given system, which may also enable the examination of the prospects of a transition from the prevailing environmental management practice, which has become locked-in in an EIA regime to a more strategic approach in Nigeria's oil and gas policy sector.

The MLP is a middle-range theory that conceptualises overall dynamic patterns in sustainability transitions. The MLP posits that transitions evolve non-linearly and through the interplay of endogenous and exogenous dynamics at three levels of regime, landscape and niche (Geels, 2002; Geels and Schot, 2007). Central to this analytical framework is the notion that a regime comprises a coherent configuration of institutional rules, practices, shared interests and assumptions, belief systems and actors with disparate values that underlie strategies of institutional and governance regimes, which often help to create and maintain path-dependent trajectories and lock-ins that preserve the status quo—inhabiting necessary transitions to a more sustainable future (Geels, 2002). At this level, it is posited that more often attempts to unlock the status quo of the regime by mainstreaming new ideas such as alternative environmental management approach by a few select actors are usually neutralised by the internal actors within the regime (Kemp et al. 1998; Loorbach et al., 2017).

Accordingly, the landscape encompasses broader and evolving exogenous shocks and trends such as environmental tipping points, climate change, biodiversity crises and sustainability concerns, which are often beyond the direct influence of regime actors and cannot be changed at will (Geels and Schot, 2007). These exogenous transition drivers from the landscape environment may exert pressure on the prevailing regime to create windows of opportunity for niche innovations to gain momentum (Geels et al., 2018). Within this context, niches serve as an incubation arena where new novel ideas can be nurtured to potentially challenge the existing regimes. Niches are important because they provide experimental space where learning and network formation among the frontrunner actors can potentially emerge, leading to the development of radical innovations. According to the niche-based perspective, the dominant practice of the incumbent regime may begin to change when new innovative ideas developed in the niche become a mainstream ideal and are adopted more widely (Berkhout et al., 2003).

However, while it has been recognised that niche innovations may initially require some protection from the selection pressures of the dominant regime (Hoogma et al., 2002; Smith and Raven, 2012), their development ultimately necessitates transcending this protective shell, as this is crucial for transforming the unsustainable policies, practices or approaches within the existing regime (Geels and Schot, 2007), such as in the case of oil and gas environmental management regime based on EIA in Nigeria.

Several studies have been undertaken to investigate a transition from a dominant unsustainable system to a more sustainable regime. For instance, Correlje and Verbong (2004) investigated the transition from a coal-based energy system to a gas and oil-based energy system in the Netherlands during the 1950s and 1960s. Geels (2005) explored the transition dynamics from horse-drawn carriages to a contemporary car-based transportation system. Furthermore, Geels (2012) investigated the transition dynamics within the transport sector. His research revealed a range of transition drivers and pathways that could facilitate a low-carbon transition in the transport industry, including the barrier hindering such transition.

In a similar vein, Rweyendela et al. (2023) and Nwanekezie et al. (2022) researched the transition prospects to low-carbon energy development in Ireland and Canada. In his study, Paredis (2011) focused on the transition to policy innovation in the Flemish waste system, and Peterson et al. (2022) leaned on the agricultural sector in the United States to demonstrate how a transition from the dominant phosphorus (P) system to a more circular P system could unfold. Van der Brugge (2009) examined a transition in the governance of Dutch water management. The study focused on processes of transformation conceptualised in a double loop that comprises the reproduction cycle of regime and actors and a loop on processes that transformed the water management regime. Conceptualising the dynamics as a product of transition processes, the author translated the dynamics into processes that occur in stages and construct patterns of change. These transition processes ranged from the regime to water management regime to niche and niche to a regime, reflecting the direction of influence and from endogenous to exogenous based on the drivers of the transition dynamics.

Intriguingly, there has, however, been no application of transition theory to explore the prospects of a transition in the environmental management practice within the oil and gas industry. This is perhaps because the oil and gas sector is still largely perceived as antithetical to the goal of sustainable development, as it is often associated with environmental and climate change challenges (Kark et al., 2015; Cordes et al., 2016). Therefore, contrary to the dominant flip-side of transition scholarship literature focusing on a wide range of different transitions ranging from historical cases to contemporary cases (Köhler et al., 2019) and overlooking the environmental management regime in the oil and gas industry, this study redefines a new functionality and applicability of transition theory, particularly the MLP to explore the prospects of transition from the dominant EIA practice toward a more strategic approach to planning and environmental assessment in Nigeria's oil and gas sector.

1.2 Aims and objectives

The overarching aim of this research is to explore the prospects of mainstreaming strategic thinking to policy-planning and decision-making for new oil and gas frontier basins in Nigeria through a transition to SEA. The achievement of the aim will require the pursuit of the following objectives;

- i. To assess the impact of oil and gas exploration and production on the environment and socio-economic characteristics in the old frontier of the Niger Delta region.
- ii. To examine the strengths and weaknesses of the current EIA practice in oil and gas planning, regulation and development in Nigeria's old frontier of the Niger Delta region.
- iii. To critically identify and analyse the prevailing conditions and perceived critical decision factors that can enable a transition from project-level EIA toward a strategic-level approach in Nigeria's oil and gas sector.
- iv. To conceptualise a transition-based framework which highlights potential transition drivers and pathways that can enable the transition from project-level EIA toward a strategic-level approach in Nigeria's oil and gas sector.

1.3 Overview of research methodology

A mixed-method research strategy was considered suitable for exploring the prospects of mainstreaming strategic thinking to policy-planning and decision-making for new oil and gas frontier basins in Nigeria through a transition to SEA. As such, the study adopted a case study strategy to achieve the overall aim of the research. Consistent with the principles of the case study strategy (Johnson and Onwuegbuzie, 2004; Yin, 2009), the study employed quantitative and qualitative techniques for data collection at various stages of the research process. The quantitative data was collected through the administration of two survey questionnaires: one with community members living in the oil and gas old frontiers in the Niger Delta region and another with the EIA practitioners. The community survey questionnaire was designed to obtain responses on environmental management practices based on the current EIA approach from the locals who resides within the Niger Delta region, where oil and gas extraction and development have been ongoing for more than six decades. In the same vein, the EIA practitioners' questionnaire examined the current EIA regime and practice-related processes for oil and gas project development in the Niger Delta region to explore the prospects of transitioning towards a strategic approach in Nigeria.

Semi-structured interviews were conducted with key actors and stakeholders who have either policy, strategy, regulation, operational, oversight and monitoring or related roles and interests in the environmental management of oil and gas exploration and production in Nigeria. The interviews served to validate the findings from the expert questionnaires and further explored the prospects of advancing strategic-level approach to oil and gas development assessment and decision-making, particularly in the new frontier basins where energy development is imminent. Furthermore, document analysis was conducted to review a comprehensive range of relevant materials, including EIA reports, legal and legislative documents and sectoral guidelines for oil and gas project developments, as well as the recently published Petroleum Industry Act. While the EIA-related documents provided essential insights into the legal requirements and other key silent features of EIA procedural practices in the oil and gas industry that were not captured in the questionnaires and interviews, the PIA document uncovered the prime objectives underlying the greater appeal for oil and gas exploration and development in

the new frontier basins.

The quantitative data was analysed and interpreted using descriptive statistical methods and non-parametric inferential statistics, with detailed outcomes presented in Chapters 6 and 7. Interview results were coded thematically and analysed using QDA Nvivo© v.11 to classify and manage qualitative information. The thematic analysis approach, which involved transcribing and coding the data, revealed underlying patterns and themes. These themes were interpreted and discussed in Chapters 8 and 9 respectively. The quantitative and qualitative findings were triangulated to provide insights into how the current environmental management practice based on the EIA system in Nigeria's oil and gas industry could be strategically shifted toward strategic EA to help guide policy-planning and decision-making for oil and gas development in the new frontier basins.

1.4 Structure of the thesis

This thesis is organised and presented in ten chapters, providing a clear and comprehensive guide through the research content. Figure 1.3 illustrates the overall layout of the thesis, followed by brief descriptions of each chapter in the sections below.

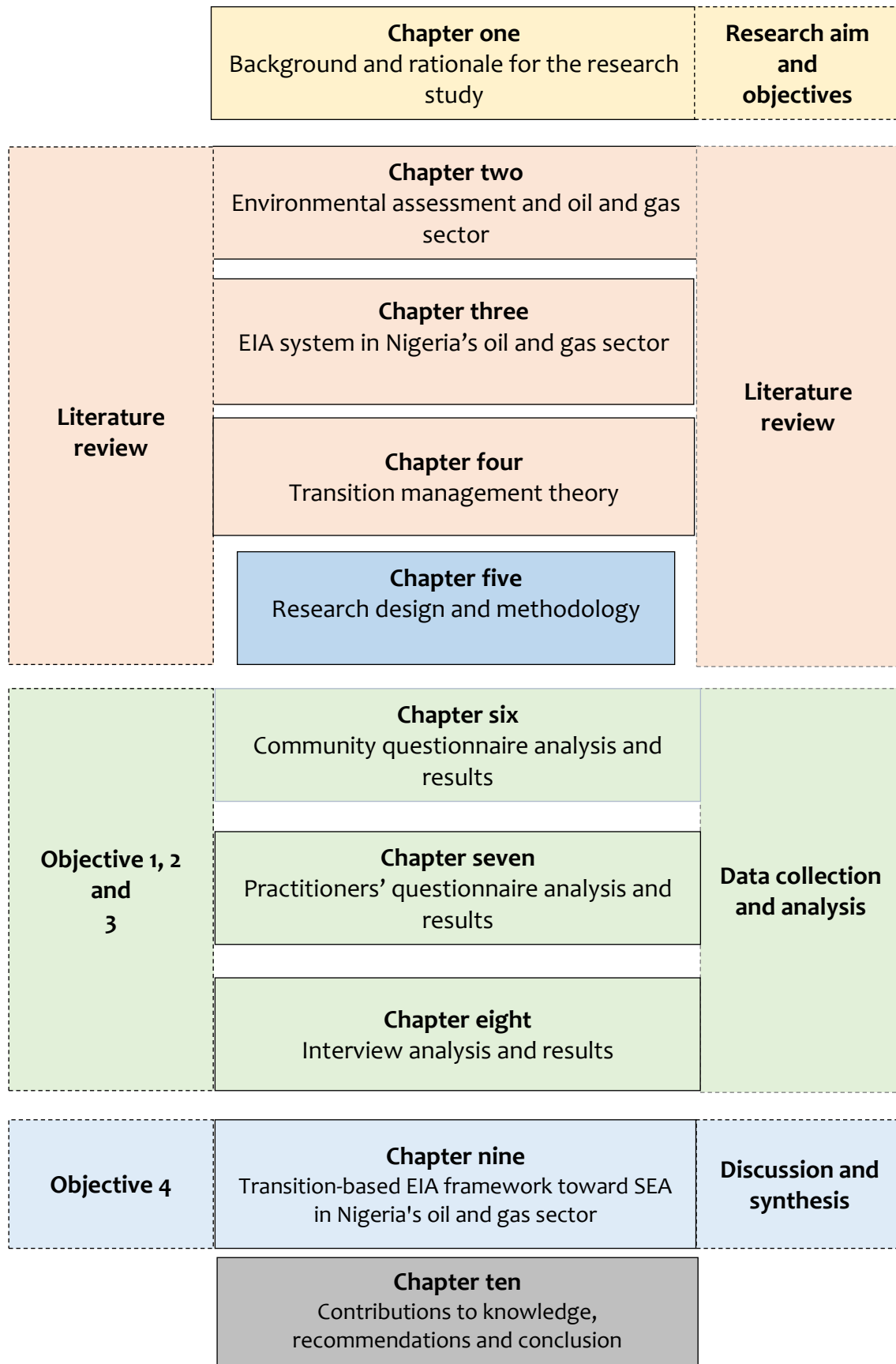


Figure 1.3: Thesis structure

Chapter One: Introduction: This chapter conceptualised the research in relation to the background and rationale for the study. It outlined the research aim and objectives alongside the methodological approaches employed to achieve the overall aim of this study.

Chapter Two: *Environmental assessment and oil and gas sector:* This chapter provides a comprehensive literature review on the role of the oil and gas industry in the global economy. It includes an overview of the interplay of power, politics and elite interests in oil extraction and development, as well as the governance structures that govern the energy sector by delineating the roles of key actors and stakeholders. The chapter then explores the environmental ramifications associated with hydrocarbon extraction, production and operations. Additionally, the chapter discusses the key role of EIA in oil and gas project planning and development and its limitations in the overall policy-planning and decision-making processes. It also considers insights into EIA and governance issues in the oil and gas industry. Within this literature section, the chapter further reviews the role of the SEA approach in policy-planning, regulation and decision-making to help drive the oil and gas decision process toward more sustainable outcomes. Finally, it examines international SEA practices in the oil and gas sector and identifies barriers to transitioning toward an SEA system, particularly in developing countries.

Chapter Three: Context and background — EIA system in the Nigerian oil and gas sector: This chapter presents an overview of the historical development of oil and gas extraction and development in Nigeria's old frontier basin region in the Niger Delta region, including a description of the new frontier basins where hydrocarbon development is looming in Nigeria. It also examined the evolution of environmental management laws related to the petroleum sector. It discusses the current EIA regime in Nigeria's oil and gas industry. The chapter focuses on the current state of practice of EIA in the Niger Delta region, institutional and regulatory administration, and power dynamics between the regime actors and key stakeholders within the EIA governance regime in the petroleum industry.

Chapter Four: *Transition management theory:* This chapter presents the theoretical framework guiding this research, beginning with a discussion of the origin and evolution of transition management theory and emphasizing the importance of the multi-level perspective as the foundational framework. The MLP posits that transitions are co-evolutionary and multi-dimensional processes that are driven by the interplay of three analytical levels: regime, landscape influences and niche development, all interacting within a nested hierarchy. The chapter further outlined the justifications for the adoption of MLP to explore the prospects of a transition from project-level assessment to a strategic approach to planning and impact assessment in Nigeria's oil and gas sector and developed a conceptual framework aligned with the research aim.

Chapter Five: *Research design and methodology:* This chapter presents a comprehensive discussion of the research methodology employed for this study. It begins by exploring the philosophical stance underpinning the research, followed by a justification for the use of a mixed-methods research approach and the key factors that informed the choice of a case study strategy. The chapter also details the rationale behind the sample size, the techniques for data gathering, the data collection process, and the methods used for data analysis and interpretation. Finally, the chapter concludes by outlining the ethical considerations adhered to throughout the research.

Chapter Six: *Community questionnaire analysis and results:* This chapter presents the results from the community survey questionnaires obtained in various oil-producing communities in the Niger Delta region through the preceding methods of data collection described in chapter five. SPSS was employed for coding and data analysis. The results reveal the inestimable impact of oil and gas exploration and production on the environment and socio-economic livelihoods, environmental management practice through EIA, public participation and the roles of relevant actors in environmental management as well as the threshold of compensation in the Niger Delta area.

Chapter Seven: *Practitioners' questionnaire analysis and results.* This chapter presents the findings from the practitioners' questionnaire. As with the preceding chapter, SPSS was used for coding and data analysis. The results reveal that while the traditional EIA has

been an important environmental management tool in oil and gas project planning and assessment, it is also reactive, has limited scope and implemented too late into decision-making to generally effective means to explore strategic concerns and options. The findings underscore the need to adopt a strategic-level approach in planning for oil and gas exploration and development in Nigeria. The chapter concludes by identifying key drivers of SEA, potential models for its integration, and potential barriers to the transition toward SEA in Nigeria's oil and gas sector.

Chapter Eight: *Interview analysis and results:* This chapter presents the results of the interviews conducted with key relevant actors and stakeholders who have either policy, strategy, regulation, operational, oversight and monitoring or related roles and interests in environmental management in Nigeria's oil and gas sector. The results of the interviews were organised and presented using the MLP framework described in Chapter Four above as a guide and then coded thematically and analysed using NVivo© v.9 to classify and manage the data. The emergent themes of the EIA regime were centred on the role of EIA in decision-making. It reveals that while the existing EIA approach to a large extent, exerts influence in the decision-making by providing a detailed understanding of the impacts of specific energy projects development in order to formulate mitigation measures in the Niger Delta region, such a project-level assessment practice lacks the capacity to address critical issues above its tiers. The results also reveal the need to shift toward a more strategic approach as attention turns to opening the new frontier to potential hydrocarbon exploration and development in Nigeria. It unearths well-founded rationales and potential critical decision factors that could enable a transition toward a more strategic approach to planning and environmental assessment and challenges to advancing a strategic approach to EA in the new frontier regions.

Chapter Nine: *Discussion and synthesis of findings.* This chapter is the meeting point of the quantitative and qualitative analysis reported in Chapters Six, Seven and Eight. It synthesised and discussed the identified themes and sub-themes from the data analysis within academic discourse, culminating with the conceptualisation of a transition-based framework that illustrates potential transition drivers and pathways that can enable the

transition from project-level assessment to a strategic approach in Nigeria's oil and gas sector. The framework is designed to underscore the benefits of a transition toward a more strategic and integrated approach to help inform the preparation of energy development strategy and environmental management framework for the new energy frontier regions and, in doing so, identify strategies and priorities for future management and development while strengthening and offsetting the limitations of the traditional project-level EIA.

Chapter Ten: *Summary, recommendations and conclusions.* This chapter summarises how this research study successfully answered the research aim and objectives outlined in Chapter One. The chapter also highlights the contributions to knowledge. Based on the insights from the preceding sections, the chapter provides recommendations for potential further areas of research work and ends with a concluding remark.

CHAPTER TWO

Environmental Assessment and Oil and Gas sector

2.1 Introduction

This chapter provides a comprehensive review of the petroleum industry, focusing on global oil and gas production and consumption, the interplay of power, politics, value contestation and elite interests within the energy industry. The chapter discusses the governance of the oil and gas sector and the roles of key actors in energy policy, regulation, strategy and operations. It then reviews the environmental impacts of oil and gas exploration, production and operations, highlighting the role of EIA in oil and gas decision-making and its associated limitations. The chapter further examined EIA and governance issues in the oil and gas industry. Additionally, It provides an overview of the benefits of mainstreaming SEA into energy policy-planning and decision-making processes, which sets the context for examining the international SEA practices in the oil and gas industry. Finally, it describes the barriers to strategic transition to planning and environmental assessment approach in hydrocarbon-rich countries in the global south, particularly in Africa.

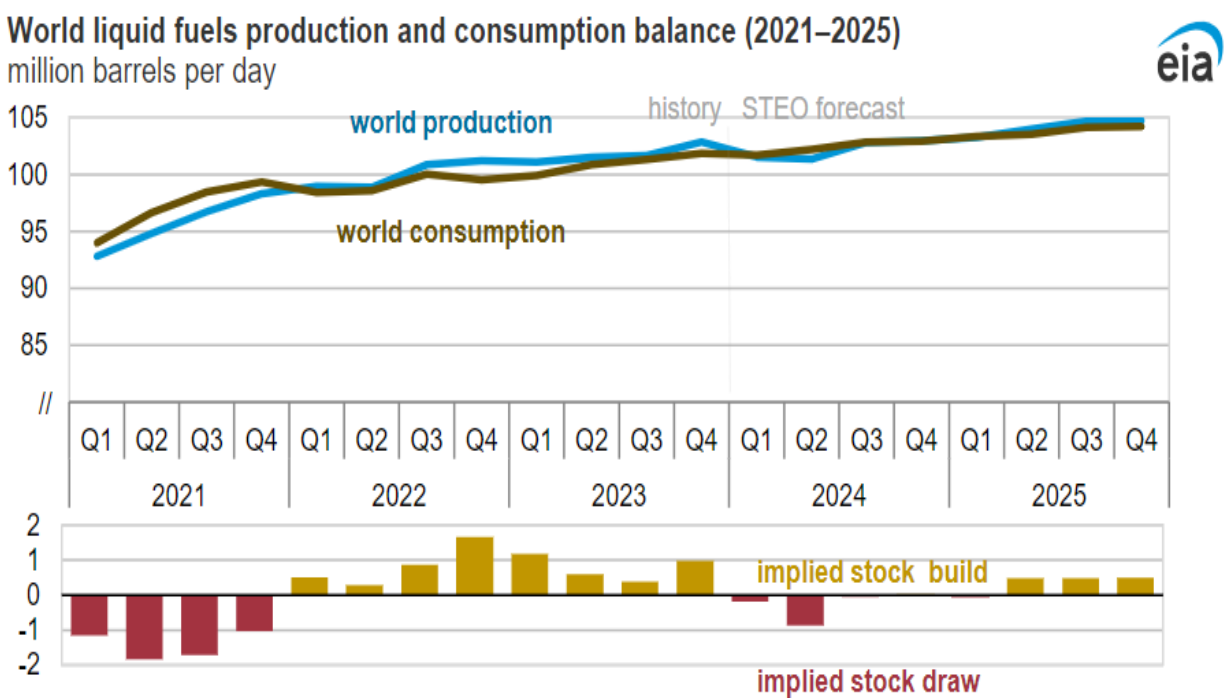
2.2 Oil and gas production and consumption

The emergence of oil and natural gas resources as tradeable commodities since the dawn of the second industrial revolution has been widely recognised as a pivotal moment that has undeniably had a profound consequential impact on the world economy for two important reasons (Smil, 2017; Landes, 1969; Klemz et al., 2021; Steven, 2016; Geng et al., 2020). First, the current paradigm of global economic development is heavily dependent on fossil fuels as indispensable ingredients of primary sources of energy supply. Crucially, for instance, nearly all major industrial production and transportation networks begin with burning oil and gas—end with it, and heavily depend on it to effectively facilitate the flow of goods, commodities and services across national and transnational borders. It has been reported that the world's mobility industry accounts for over two-thirds of the energy demand and consumption because of the profound reliance of cars, aeroplanes, rails and ships on petroleum motor spirits and aviation fuel derived from organic liquid hydrocarbons (Graham and Ovadia, 2019). Second, the by-products of oil and natural gas are ubiquitous and serve as raw material for various industries and

countless products such as power generation systems, process heating, manufacturing of computers and smartphones, pharmaceuticals, toothpaste and lipstick, fertilisers, solvents, plastics and diapers (Speight, 2017). In 2022 alone, the volume of crude oil (including biofuels) consumed globally reached 100.37 million barrels per day Energy Information Administration, 2024).

The Energy Information Administration (EIA), an official forecaster of the energy market, has projected that the global fossil fuel demand will reach a record 102.3m b/d in 2024 to service ever-growing global demand (See Figure 2.1). Oil, for example, is forecast to remain the largest component of the primary energy mix, contributing an estimated 30 per cent of global energy for the foreseeable future (Zuoqian et al., 2022). Likewise, natural gas, which currently accounts for 21 per cent of the world's energy, will continue to grow to an estimated 25 per cent by 2030 (IEA, 2024).

Figure 2.1: Projection of world liquid fuels production and consumption for 2021—2025



Source: Energy Information Administration (2024)

However, it is important to note that most of the demand for fossil fuel is predicted to come from countries outside of the Organisation for Economic Co-operation and Development (OECD) (Graham and Ovadia, 2019). In part, this is due to the pace of

industrialisation in developing countries and the meteoric rise of the economic and geopolitical standing of the emerging markets in the Asia/Pacific countries, particularly China and India, which is rivalling North America and Europe's influence that has shaped the global economy for over half of the last century (Abor et al., 2023; World Bank, 2019). This suggests, among other things, that the predictions about the imminent end of the petroleum era have come to pass or perhaps proven unfounded as the demand for fossil fuel, particularly oil and gas commodities continues to rise due to increasing consumption across the globe and the adoption of new technologies to extract conventional and unconventional (shale fracking) oil and gas natural resources reserves in various regions and jurisdictions in the world (Fulwood, 2023; Zuoqian et al., 2022).

2.3 Oil and gas extraction: exploring the interplay of power, politics, value contestation and elite interest in the energy industry

The scramble for oil and gas natural resources has defied the conventional configuration of time and space because of its unparalleled position as the world's primary source of energy supply (Cordes et al., 2016). This is said to be the key factor that has transformed oil and natural gas as politically charged commodities—transcending individual communities, regions and national borders (Devold, 2013) and has led to the emergence of international order in oil politics (Van de Graaf and Colgan, 2016). The concept of "international order" in the oil and gas industry has been defined in various ways by different scholars; therefore, there is no universally accepted definition of international order in the scholarship literature. For instance, Ikenberry (2000: p. 23) described international order as "the governing arrangements among a group of states, including its fundamental rules, principles and institutions". Bull (1977: p. 8) defines international order as "a pattern of activity that sustains the elementary or primary goals of the society of states or international society". Reus-Smit (2018: p. 13) views international order as a "systemic configuration of political authority."

In offering a more nuanced understanding of the condition that shapes international order in oil politics, it is important to lay credence to the dominant and yet contrasting work of scholars and researchers such as Mommer (2000), Claes (2018), Wilson (2019), Colgan (2021) and Goldthau and Witte (2010), which draws inspiration from the

International Relations (IR) and interdependence. They premised their arguments, particularly on two theoretical accounts that dominate the IR and interdependence scholarship literature. A geopolitical approach—conceptually linked to IR realism and a global energy governance approach that draws inspiration from IR liberalism to underscore the centrality of politics, power, values contestation and elite interests that characterise the energy industry. Central to the geopolitical account is the proclamation that hydrocarbon energy resources are a product of geographical reality and are unevenly distributed between jurisdictions and countries. For instance, some countries have abundant energy resources, enabling them to potentially export oil and natural gas commodities, while others lack such mineral resources endowments and must depend partially or wholly on imports. These inherent structural disparities in energy resources endowment form the foundation of the geopolitical dynamics surrounding the oil and gas industry. It shapes the interplay of hydrocarbon exploration, production and operations, trade and market forces and the influence wielded by the corporate interest of major oil companies and their powerful countries seeking to control these resources based on specific international governance systems (Hughes and Lipsky, 2013; Overland, 2015; Stevens, 2019).

The rationale for the emergence of the governance system in the oil and gas industry evokes a long-term historical antecedent; they were conceived and established at a time when the international oil companies (IOCs), largely based in the United States and Europe exercise unfettered monopolistic powers in the global politics (Pirog, 2012). The IOCs are privately owned anglo-american oil companies that constitute what was known as the international petroleum cartel or seven sister oligopolies that largely influenced the arrangements of the first global oil system prior to World War II to explicitly and implicitly govern the oil and natural gas exploration, production, operations and trade regardless of the prevailing affinities of values, geography and regime type and complexities (Parra, 2003). Russett (1984) and Colgan (2021) argued that the configuration of the oligopolistic structure in the energy industry at the time was driven by the hegemonic industrial capitalism that was built around the commodification of oil and natural gas resources in the international market to protect the interest of elite oil corporations and their powerful western countries. This system conceptualised energy

resources as indispensable economic ingredients and scarce assets of existential value for the major powers and their military establishments. Wilson (2019) posits that the system framed the struggle for access to energy as a zero-sum game whereby any threat posed to the exploitation of hydrocarbon resources in producer countries can be seen as a potential security threat to the interest of the West.

Oil politics is therefore inextricably intertwined with the energy security interests of the Western countries, which makes it a critical driver of foreign policy that led to the emergence of the rules of the game—that is to say, the institutional framework that underpins the global energy industry—governing the key aspects of the licencing regime, production and operation, trading, financing and hedging oil and gas ventures through international financial markets, investment treaties and trade agreements (Buzan et al., 1998; Andrews et al., 2016; Overland, 2015). These institutional ecosystems of international oil and gas systematically undermine the roles and interests of smaller or less powerful states rich in energy resources, along with their sovereignty and the right to ownership of the hydrocarbon reserves as well as bargaining power within the institutional context that framed the oil and natural gas trade, markets, royalties, financing and investment treaties. At the fundamental level, as Claes (2018) pointed out, the systems operate according to the interests, wills and behaviours of the powerful actors who have crafted them. They exert enormous influence over poor resource-rich countries regarding domestic oil and gas policies, regulations and decision-making processes. This involves determining how much oil and natural gas resources are extracted and in which countries or territories to produce them to keep the prices extremely low and steady to ensure sufficient and reliable supplies of these commodities in order not to jeopardise the perceived importance of national security (Deutch et al., 2006; Steven, 2016). Thus, the asymmetric nature of relations based on the rules of the game spurred by the era of corporate interest of the IOCs and the capitalist hegemon of powerful consumer countries contributes to significant implications for local and global oil politics.

However, several factors can explain why the oligopolistic system weighs in global oil and gas geopolitics. These include the threat of punishments (quasi-imperial power), often through military adventures, economic coercion and leadership selection in several

resource-rich countries in Latin America, the Middle East and Africa (Colgan, 2021; O'Sullivan, 2013; Painter, 2014). When these coercive instruments are not used in the event of non-compliance with the existing rule-based that underpin the global order in the petroleum industry, various enforcement options come into play that involve sanctions or embargos and, in some exceptional cases, quota systems which are unilaterally imposed on the subordinate states perceived as pursuing goals that are at variance with the interest of the major powers. A study conducted by Fischhendler et al. (2017) found that about sixty-five cases of energy sanctions have been utilised as a tool of coercive diplomacy since 1938 within the broader landscape of the oil and gas industry to privilege the corporate vis-à-vis interest of the major powers. This situation spectacularly captured what McGowan (2009: p. 21) has coined as a “paradox of sovereignty”, where less powerful yet rich resources countries have limited control over their territorial oil and gas natural reserves, policy and operational pathways—due to the prevailing externalities of governing arrangements that structure energy production and international markets psychology which are beyond the scope of their political and economic reach. Klare (2009), Glaser (2013) and Ravenhill (2013), however, observed that the consequences of the securitisation of energy based on zero-sum competition have become a source of inter-state rivalry and conflict between the powerful consumer nations, predominantly the Western developed economies and poorer producer countries. Nevertheless, poorer countries rich in energy resources tend to oblige or prioritise the interests of the dominant actors rather than to secure greater and fairer rents and royalties from their natural resources commodities for the welfare of their citizens and the protection of the environment (Adams., et al., 2019).

The geopolitical view of the energy governance system is, however, nuanced and challenged on a strategic level. According to Wilson (2019), the central underpinning of the geopolitical arguments only offers a partial view and perspective of the complexities of the global political economy of the petroleum industry by downplaying the political patronage and economic dynamics at the sub-national level. It is argued that such insights overlook local factors and specificities that typically obscure the prevailing interests of the powerful elite in resource-rich countries, particularly in the global south. For instance, the geopolitical insights ignore the asymmetrical power relations that

underlie access to and control of hydrocarbon production and revenues, along with their profound impact on the local population (Mommer, 2000; Hults and Heller, 2011). In essence, the oligopolistic system conventionally represents a political game that is principally about resources rent capturing and commercial interest involving two parties rather than a single dominant power: the national government, which lays ownership of the natural resources beneath the surface and the big multi-national oil companies that have the machinery to dig out crude oil from below the ground (Mehlum et al., 2006). This symbiotic relationship between the powerful political elite in the oil-abundant countries and the IOCs that are backed by powerful countries forms the basis for which new alliances emerged that mediate the outcome of oil and gas exploration, production and operations. Many of the petro-states in the developing countries operate socio-political clientage systems that favour the multi-national oil companies to extract hydrocarbon resources that largely privilege the ruling elite at the expense of their citizens and the integrity of the environment (Osei et al., 2023; Obi, 2019).

In many petro-states in the global south, elites' state-centric quest for power dominance allows them to regulate hydrocarbon licensing, exploration and development and unfettered access to oil and gas colossal proceeds or revenues. Considering the high stakes in the struggles to gain access to or control the oil and natural gas resources, which represent vast influence and wealth, capturing these resources becomes the ultimate prize in a zero-sum game for the rich elites seeking to entrench their political power (De Oliveira, 2007; Yates, 1996). It is, however, important to highlight that the rent-seeking behaviours of the elites often create acute disparities between the elite interest groups and the general populace.

In their studies, Badeeb et al. (2017) and Medase et al. (2023), for instance, found that the poor development outcomes in several oil and gas resources countries such as Angola, Chad, Gabon, Nigeria, Sudan, Sierra Leone, Republic of Congo and Venezuela are linked with the inability of the elite at the sub-national states to explicitly and effectively manage the petroleum resources governance to improve the life and livelihood their citizens. As a result, most of these countries are faced with the often-cited cliché of the “resource curse” or “paradox of plenty”. Cotet and Tsui (2013, p. 77) state that “the

resource curse doctrine holds that natural resource wealth is an obstacle to economic and political development.” It is premised upon a causal “relationship between natural resource abundance and conflict propensity” (Wegenast, 2013: p. 392) and largely due to rampant corruption and embezzlement, political instability and unrest (such as civil wars), high-income inequality and the scourge of environmental degradation (Okwelum, 2020; Wegenast and Schneider 2017; Khan et al. 2020). These flagship issues often induce a recipe for the violent nature of oil politics that shapes most of the low-income countries endowed with oil and natural gas reserves.

In Nigeria, as in other oil and gas-producing countries in Africa, the relentless quest over access to and control of hydrocarbon natural resources has often fanned the embers of intense political scheming, division and marginalisation even among the different classes, ethnicities and regions (Ayotunde, 2018). More often, it has fueled agitation for access and control of hydrocarbon resources by the perceived excluded or alienated groups framed in the discourse of ethnic minorities and environmental rights. For example, the Movement for the Emancipation of Niger Delta (MEND) out-lash a mixture of protests and violence against the perceived corrupt socio-political patronage system, its failure to evenly distributes the proceeds from the oil and gas and its incapacity to protect the natural environment (Gboyega et al., 2011; Obi, 2014; Omeje, 2006). Foreign investors and IOCs often leverage the dysfunctional natural resources governance systems in the host countries to disproportionately benefit their corporate interests and the strategic geopolitical objectives of the Western countries.

However, this line of thinking is highly contested by Lloyd and Klare (2008), who argued that the growing populist and nationalistic energy policy of a rising power among the oil and gas producers to a certain degree is challenging the unequal power relation despite the apparent weakness of the natural resources governance structure in these countries. The nationalistic populist and protectionist behaviours adopted by some developing countries rich in energy resources are often perceived as conflicting with the prevailing status quo of the oil governance system. In this way, the relationship between IOCs and governments becomes inherently conflictual. A range of conflicts may occur along a spectrum of intensities, ranging from contentious negotiations on energy, production,

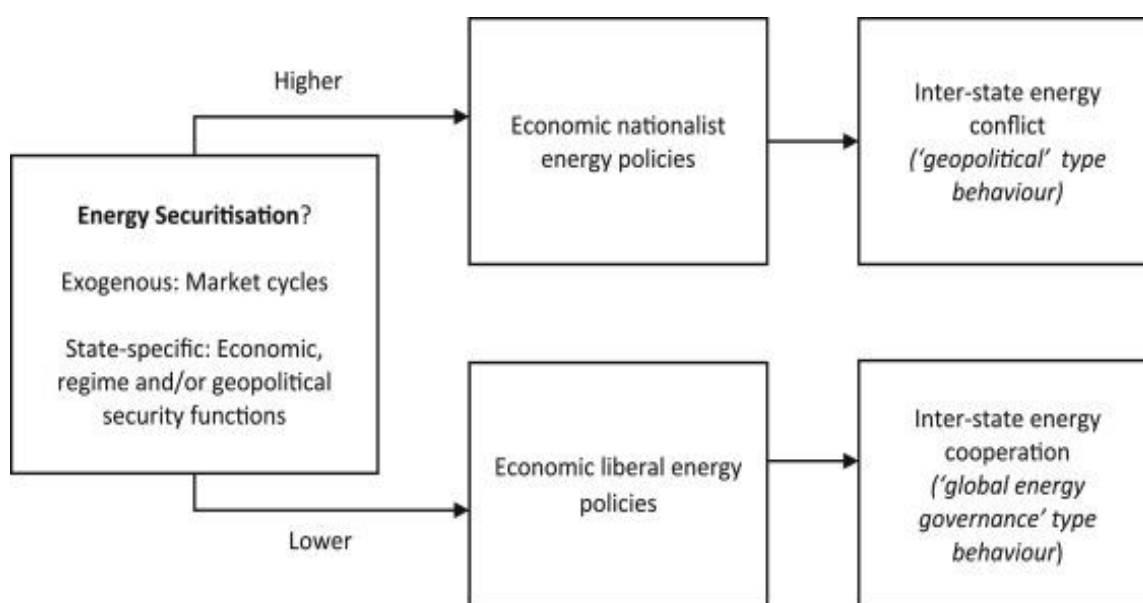
supply and price benchmarks in international markets to trade disputes and the potential risk of sanctions. In the most extreme cases, these disputes may reach the pinnacle of what is commonly known as resource wars. In such situations, the oil-producing state may attempt to assert ownership over oil and gas reserves and deny access to energy resources to the perceived unfriendly parties (O’Sullivan, 2013; Grasso, 2019).

Unlike the geopolitical approach, which conceptualises energy as scarce assets of existential importance for power and economic dominance that has become a source of inter-state conflict, the global energy governance approach, which draws on concepts from neoliberal institutionalist IR theory advanced a scholarly discourse that energy is a potentially cooperative international domain (Wilson, 2019). It defined the energy industry as a positive-sum interdependence capable of fostering more hybrid relationships and interactions between the critical actors in the oil and gas sector (Keating et al., 2012; Goldthau and Witte, 2010; Hancock and Vivoda, 2014). This approach, known as energy globalisation, gained traction with the emergence of the second oil governance when oil and gas-exporting countries established their cartel known as the Organization of the Petroleum Exporting Countries (OPEC) (Garavini, 2019; Hochman and Zilberman, 2015). The OPEC revolution in the early 1970s centred around nationalisation, privatisation, and industrialisation (Victor et al., 2012; Bridge and Le Billon, 2017), significantly shook the very foundation of the first rules of the game led by Anglo-American political control and influence, resulting in profound changes in power dynamics, supremacy and dominance in global oil politics (Colgan, 2021).

The global energy governance approach emphasises market-based principles of energy securitisation (Chester, 2010). This approach emphasises the need to move beyond the dominant access-based imperialist mentality underlying geopolitical strategies and conceptualises energy security concerns as a catalyst for developing inclusive and robust international energy markets (See Figure 2.2). A key aspect of this concept, highlighted by McGowan (2018) and Goldthau and Witte (2009), is the recognition that depoliticising oil and gas interdependence that established the first ‘rules of the game’ can foster market competition centred on equality in investment, production and trade among the inter-states and across all the major parties in the international market. Embracing this

form of an international order based on win-win principles in global oil politics is promoted as having the potential added-value to develop and project the petroleum landscape for the 'global public good,' ensuring the energy security of all global economies and engenders a positive-sum game or cooperation (Van de Graaf and Colgan, 2016; Goldthau and Witte, 2010) regardless of geographical size, influence or military prowess. This approach is increasingly seen as a means that can help deepen cooperation and collaboration across various aspects, such as information sharing, robust negotiation, trust-building between governments and major corporate firms and policy co-ordination while addressing issues related to licensing regimes for hydrocarbon exploration and production activities, fiscal regulations, geopolitical competition, sovereign taxation, price control and stability, power dynamics among critical stakeholders, resource exploitation practices, protection of indigenous peoples' rights, and the promotion of sustainable environmental management (Mommer, 2000; Steven, 2016; Wilson, 2019).

Figure 2.2: Securitisation and governmental approaches to energy interdependence



Sources: Wilson (2019)

Despite the emergence of a global energy governance approach rooted in fairer and equitable international market principles and supporting institutions that govern the 'rules of the game' for the energy industry with the potential to help ameliorate conflict tendencies and encourage positive-sum cooperation, the interaction within the global oil

and gas decision-making space at national and international and across multiple and contrasting dimensions of shared interests have led to the creation of an energy regime complex—a set of formal and informal governmental and non-governmental institutions to designed to manage energy interdependence (Mommer, 2000; Colgan et al., 2012). Therefore, the oil and gas industry is still profoundly intertwined by value conflicts, disparate interests and objectives, politics and power struggles due to the convergence of a wide range of key actors in the oil and gas governance triangle.

2.4 The characteristics of the contemporary governance of the oil and gas industry

The governance structures within the oil and gas sector possess a historical context, having been established during periods when dominant players could exert significant influence under advantageous conditions or favourable circumstances. Nevertheless, the landscape of the oil and gas industry has undergone substantial transformation due to a confluence of factors, including rapidly shifting geopolitical dynamics, advancements in technology, persistent demand, and pressing environmental and sustainability issues that now shape the sector. From a comprehensive viewpoint, numerous fundamental elements of the industry have been significantly altered or redefined. The subsequent sections will provide an in-depth analysis of the characteristics that define the modern oil and gas industry.

2.4.1 The oil and gas governance

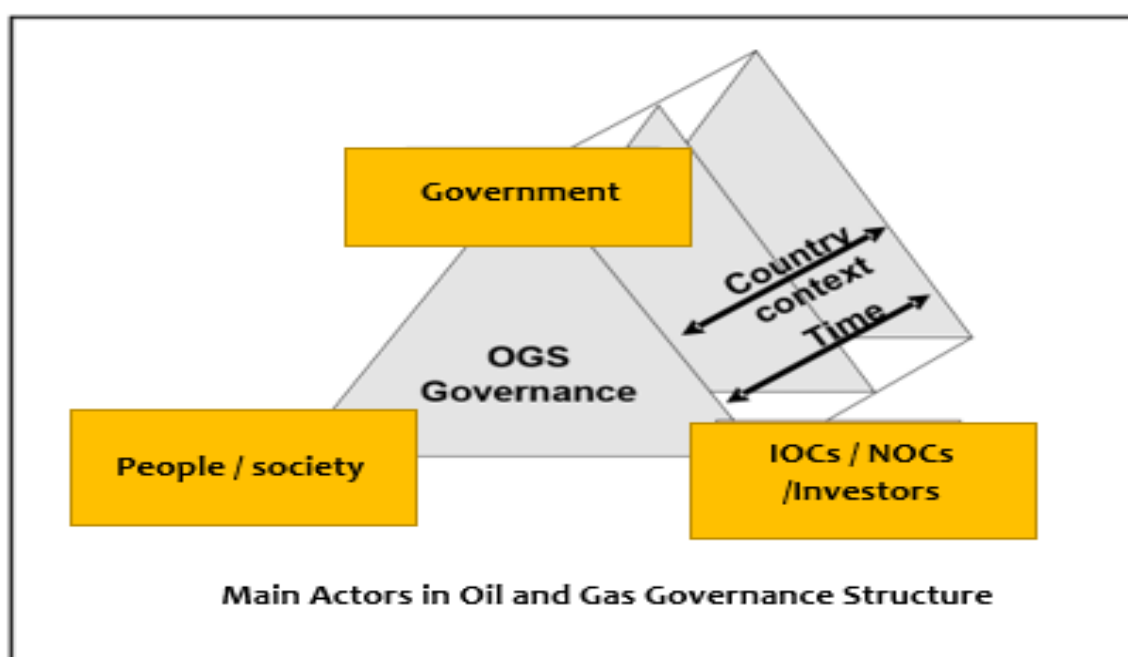
Oil and gas governance is a concept that has become embedded in the 21st-century economic development discourse (Tatar et al., 2024). While often used interchangeably with oil and gas resource management, the two concepts are distinct yet complementary (Ni, et al., 2022). Oil and gas resource management focuses on the interactions between humans and the natural environment, whereas oil and gas governance addresses the systems and institutions that shape these interactions (Ushie, 2013). In essence, oil and gas governance refers to the system of rules, practices, institutions and processes through which the energy industry is regulated and managed, how power and responsibilities over natural resources are exercised, how policy, plan and program decisions are taken, and how actors participate in and benefit from the management of natural resources (Ushie, 2013; Chen et al., 2023). Myers et al. (2009) describe oil and gas governance as the system or arrangement that sets a direction for shaping and

implementing policy, strategy, and operational and monitoring decisions concerning the extraction of a state's oil and gas resources.

2.4.1.1 Major Actors: Characteristics and interests

The oil and gas governance structure comprises key actors: the government or state, the people or society, and the investors or operators. The state actors may include official regulators at various government agencies and organisations, as well as the national bank. Parliament, non-governmental organisations, civil society organisations and media groupings may represent the people and society. Conversely, the investors/operators grouping includes international oil companies (IOCs), national oil companies (NOCs) and investors (See Figure 2.3). It is important to note that the interactions between these actors may differ across different jurisdictions. For instance, state-owned national oil companies can sometimes function more as government agencies than as independent operational companies. The subsequent sections offer detailed insights into each actor's roles, functions, interests and interdependence within the oil and gas governance framework (Lahn et al., 2007).

Figure 2.3: Major actors in the oil and gas governance



Source: Lahn et al. (2007)

2.4.1.2 Government (regulators)

Scholars like Hunter (2014) and Doric and Dimovski (2018) assert that the role of government in the oil and gas industry is synonymous with the state's capacity to effectively govern and control hydrocarbon development for the welfare of its citizens. The importance of government in the petroleum sector largely stems from the recognition that oil and gas reserves can be extracted from a vast potential hydrocarbon field by different multi-national oil companies, often with limited knowledge of the geological, ecological and social contexts of the areas in which they operate. It is therefore the prerogative of the state rather than a particular group of oil companies operating in their designated jurisdiction or frontiers to regulate the patterns of hydrocarbon exploration production and operations. The key elements of government regulations involve (a) setting a comprehensive policy and plan direction that guides the development of a country's oil and natural gas reserves; (b) configuration and organisation of the petroleum sector, the decision-making and communication processes, defining industry key policies and objectives; and (c) effective coordination and regulation between different levels of government departments and sectorial initiatives and for stakeholder engagement and consultation in the formulation and implementation into practice environmental and sustainability strategies for the industry (Kardos, 2012; Florini and Sovacool, 2009).

It is generally acknowledged that the legislative framework developed by the state is a fundamental instrument in administering and managing oil and gas drilling activities. Variations, however, exist in the petroleum governance regulatory framework across different jurisdictions. Several plausible reasons exist for such variations in structuring the oil and gas government framework in various countries. These include the type nature of the political system, the degree of reliance or dependence on oil and gas resources, the life-span of hydrocarbon resources, the level of national economic advancement, the capacity of energy governance and institutional framework, the nature of civil society and commitment to international obligations (Stevens, 2016; World Bank, 2010).

Black (2007) states that the regulatory framework governing oil and gas development can be rule or objective-based. The rule-based regulatory procedure is rooted in the legislatively entrenched rules that enable government regulators to oversee oil and gas extraction and development. This system requires formulating new regulations whenever a new regulatory situation emerges. In addition, rule-based regulation may lead to discrepancies and rigidity in policy decisions, and oil companies are prone to creative compliance measures as they attempt to adapt to changing rules and circumstances. In contrast, objective-based regulation lacks detailed and prescriptive rules; rather, it focuses broadly on stated objectives or principles to establish a reference benchmark by which oil companies undertake their exploratory and drilling activities (Black, 2007). It is often referred to as objective-based regulation because it facilitates the implementation of varying potential and desired outcomes or objectives rather than being inclined toward specific rules or rigid requirements of policy commitments. Under this system, regulatory authorities and oil companies can strive to devise creative and innovative strategies and technologies to achieve sustainable outcomes that align with the overarching goals and principles embedded in the government's policy and regulatory framework. For instance, objective-based regulations can prioritise a range of overarching objectives, such as sustainable environmental management practices, resource conservation and the culture of corporate social responsibility (CSR), enabling flexibility for oil companies to determine the most appropriate and relevant means to achieve these goals within the prevailing policy and regulatory framework (Appiah-Adu, 2016; Melyoki, 2017; Oyewunmi et al., 2017).

Of significance, as underscored by Hunter (2014), is that irrespective of the specific regulatory framework adopted by a country in its oil and gas industry, the state must ensure coordinated and effective implementation of the regulatory system across departments and agencies in a manner that is transparent, predictable and align with the country's overarching petroleum objectives. This is because poor coordination may create fragmented and duplication of administrative roles and responsibilities, leading to discordant and frictions within the petroleum organisational structures and the compartmentalised scope of the policy-planning decision-making process. Several studies have highlighted the key challenges arising from centralised, hierarchical and

tightly controlled petroleum governance systems, including jurisdictions where ambiguity in institutional regulatory roles and responsibilities has led to duplicative and overlapping oversight in hydrocarbon regulations and management decisions. In their studies, for example, Emeseh (2012) and Ambituuni et al. (2014) have found the prevalent of conflicts, rivalries and jealousies among various levels of government and federal and state parastatals in Nigeria due to poorly defined and unclear jurisdiction on oil and gas regulation, management and monitoring decisions.

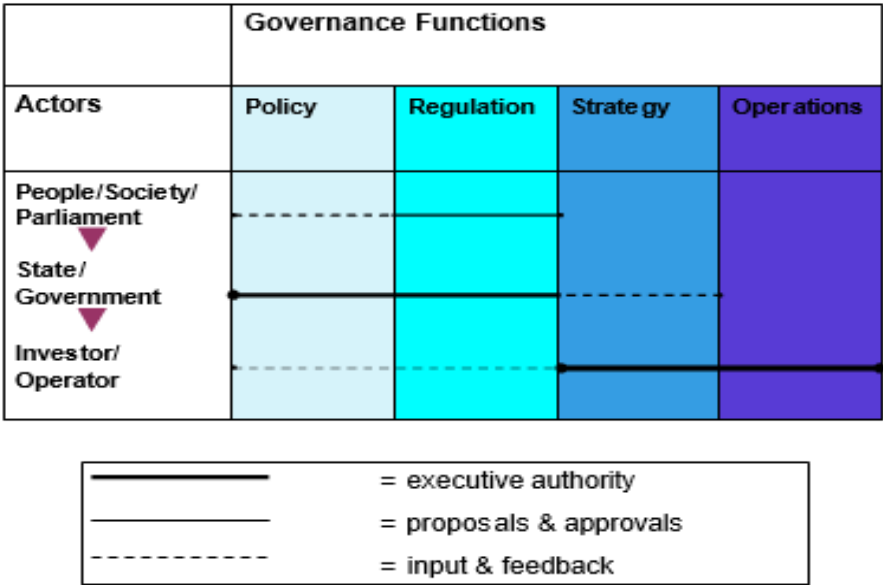
In contrast, in the United Kingdom, Norway, Canada and the United States, oil and gas regulatory regimes are decentralised with well-defined administrative roles and responsibilities, which facilitate more effective coordination and engagement with the oil companies, relevant stakeholders and interested parties in the policy-planning and decision-making process regarding hydrocarbon licensing, exploration, production, operations and management (Bennear, 2015; Doric and Dimovski, 2018). For instance, the multi-jurisdictional roles and responsibilities for hydrocarbon regulations in the UK are explicitly delineated between the Oil and Gas Authority and the Department for Business, Energy and Industrial Strategy (BEIS), along with other subsidiary agencies at national and local levels, each assigned with a specific task to minimise duplication of effort and policy paralysis in the petroleum sector (Oil and Gas UK, 2015; Oil and Gas UK, 2020).

Doric and Dimovski (2018) reported that the Norwegian interagency administrative structure within the petroleum sector separated functions among three government-controlled entities: the policy-making is overseen by the Ministry of Petroleum and Energy, which manages the issuance of licenses for exploration and production. A distinct regulatory agency, the Norwegian Petroleum Directorate oversees all aspects of hydrocarbon extraction conducted by oil companies, including revenue collection, while providing technical advice to the Ministry. A commercial entity, the Norwegian national oil company, also plays an active role in petroleum operations in Norway and internationally. This decentralised administrative design is widely recognized as a best practice model for regulating petroleum resources within government institutions to harness and promote sustainable production (Thurber et al., 2011). Similar governance structures exist in Canada and the US, where roles and responsibilities are clearly defined

between entities such as the Canadian National Energy Board (NEB), provincial energy agencies, and the US Federal Energy Regulatory Commission (FERC) and its counterparts to facilitate a more coordinated policy and decision-making to foster a more sustainable energy development (Atris and Goto, 2019; Makhholm, 2015).

In light of the above, as Lahn et al. (2007) emphasised, the petroleum governance system should not be centralized, hierarchical, and tightly controlled; instead, it should adopt a more hybrid model that clearly delineates institutional roles and responsibilities while incorporating the involvement of relevant and interested actors. This is largely because the oil and gas industry is complex and characterized by value conflicts, disparate objectives, and power struggles among the state as a regulator, the corporate interests of oil companies, and the aspirations of society (Grasso, 2019). Therefore, a more inclusive administration of petroleum activities is essential. Figure 2.4 below illustrates an ideal and generic governance model for governing the petroleum sector with clarity of goals, roles and responsibilities between the principal yet heterogeneous actors in terms of those responsible for oil and gas policy and decision-making, providing informational input, recommending a course of strategy and operational decision and those responsible for implementing the decision and monitoring the implementation (Lahn et al., 2007).

Figure 2.4: The roles of key actors in oil and gas governance



Source: Lahn et al. (2007)

2.4.1.3 International oil companies (IOCs)

The international oil companies (IOCs), referred to as 'Super-Majors' or 'Big Oil', were established in the late 19th to early 20th centuries (White, 1976; Yergin, 1991). This group comprises several leading transnational oil and gas corporations, including Chevron and Exxon Mobil, British Petroleum (BP), Royal Dutch Shell, Eni and Total Energies (Thomas, 2003; Bricout et al., 2022). These oil majors are not government-led entities but privately owned Western-led business-oriented conglomerates with headquarters in Europe and the United States (Steven, 2016). These large and integrated oil corporations developed a solid and influential system of interlocking prowess that allowed them to operate internationally across the oil and gas development cycle or value chain: upstream (crude oil production), midstream (distribution of petroleum products) and downstream (transportation, refining and marketing).

According to Beck et al. (2021), IOCs are characterised by technical competence and financial wherewithal, investment capacity, human resources and skills in large-scale project development and management. In the energy sphere, these features accord the

IOCs inherent strategic leverage to engage in highly complex, risky and capital-intensive hydrocarbon drilling activities requiring state-of-the-art technologies. For example, the super-majors as the transnational oil elite, possess an unparalleled capacity that can be linked to a modern miracle: they can discover hydrocarbon molecules trapped beneath layers of sand and rock within a short timeframe of two to four weeks, which traditionally and painstakingly took a substantial number of years to achieve (Grasso, 2019). Their prominence in the technical and financial trade and markets relative to the existence of the national oil companies afforded them a leading role and influence in the global oil and gas political economy (Bricout et al., 2022).

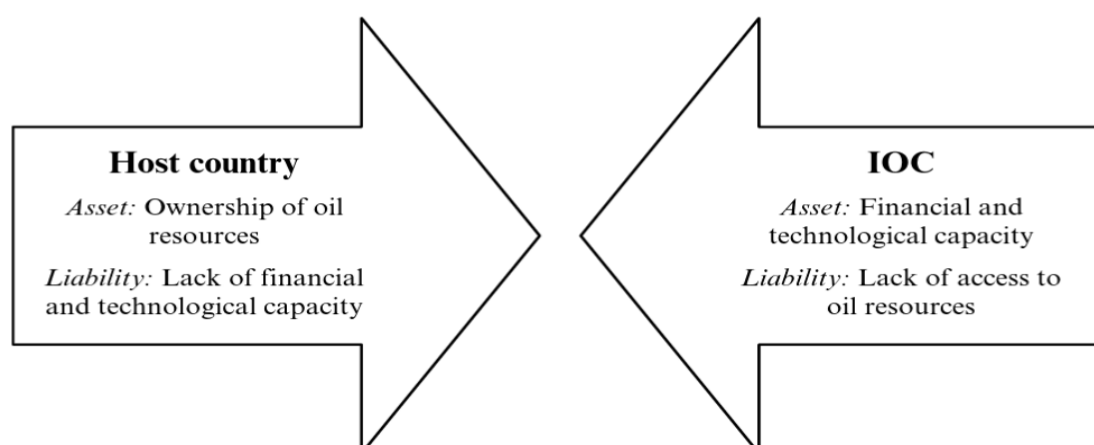
Until the 1960s, at the core of the geopolitical arena and the political economy, the Western IOCs essentially play a leading role on a global scale, giving them immense collective bargaining strength in terms of strategic disposition in the oil and gas industry. These oil companies possess unparalleled influence and wealth—much more affluent than the individual oil-producing countries in which they operate, particularly in the global south. In their analysis of the transnational activities of major oil companies de Graaff (2017) and Roe (2012) stressed that the IOCs' have established deep networks of partnerships and influence through a bundle of strategic geopolitical options such as coercion, co-operation and competition. However, scholars such as Keating (2015) and Stevens (2008) state that in many instances, the IOCs have been used as strategic assets by their country of origin to pursue rent-seeking and project soft power influence to drive or achieve their government's foreign policy goal. This practice is largely driven by the securitization of energy and the dependence of powerful net-importing countries, which significantly influence the global economic and political landscape.

Therefore, the IOCs' control of the energy infrastructure has made them a critical part of strategic national security mechanisms to address supply disruptions and price volatility issues to achieve the socio-political goal of their countries of origin. These include maintaining stable supplies of cheap oil and gas commodities, revenue for their home governments, profits for investors/shareholders and employment for the expatriates working in the oil and gas value chain (Maugeri, 2006; Beck et al., 2021). Similarly, Frynas and Paulo (2007) opined that the IOC's engagement in several petro-states, particularly

in the developing nations has political and economic dimensions. The former relates to the IOC's unilaterally quest to gain access to and control of oil and gas reserves through coercion, lobbying and political campaign donations and the latter is mainly informed by the IOC's thirst for rent-seeking to maximise the profit for their shareholders (Alden, 2005; Graham and Ovadia, 2019; Bridge and Billon, 2017). This view was further reinforced by Stander and Becker (1990), who posit that the major multi-national companies have no specific national allegiance but are ideologically disposed to consolidate their corporate presence or reach in any natural resources-rich country in which it is deemed profitable to be domiciled.

Colgan et al. (2021) observed that the relationship between International Oil Companies (IOCs) and host countries can resemble a bargaining game, with the balance of power shifting over time. The core objectives of this arrangement stem from the respective goals and resources of each party involved. Host countries control access to valuable natural resources and issue licenses for oil exploration and production, often requiring upfront payments from IOCs. Consequently, IOCs typically invest funds despite the uncertainty of future hydrocarbon discoveries. However, if no IOCs are willing to leverage their capabilities to apply for hydrocarbon licenses, the host country cannot exploit its oil and gas resources, at least in the short term. This scenario grants IOCs an advantage in negotiations. Nonetheless, it is crucial to recognize that IOCs cannot independently develop the petroleum sector; they rely on cooperation with the host country to ensure their investments are worthwhile.

Figure 2.5: Schematic illustration of the obsolescing bargaining model



Source: Colgan et al. (2021)

However, the above postulation is contested by Wokoro and Emeka (2009), who argued that even when the IOCs negotiate and finalise applicable international hydrocarbon exploration contracts with host countries, they often face non-binding demands from the hosts. This is because the host countries typically adopt a hands-off approach to major issues such as environmental and social consequences that result from the hydrocarbon exploratory activities occasioned by the IOCs. Other scholars opined that the power relations between the petro-states in Africa and international oil companies are still characterised by unequal bargaining leverage due to their geopolitical power, cutting-edge technologies and experience, enabling them to influence policy decisions on hydrocarbon development (Obi, 2019). As such, the influence of the IOCs and their operational activities loomed large in many oil-resources-rich countries in the global south and coupled with the laissez-faire attitude of the elite actors at the sub-national, the exploratory activities of the IOCs continue to induce negative environmental and social consequences on the inhabitants in communities living proximate to areas from which they extract oil hydrocarbon resources (Price, 2020; Sam et al. 2017; Cordes et al., 2016; Jiménez et al., 2018; Adeola, 2022).

Although some IOCs are required by law to prepare and implement environmental management strategies to address the risks and impacts associated with their hydrocarbon drilling operations. In particular, some major IOCs report that they

implemented certain measures to mitigate the effects on and protect biodiversity and the social livelihood dimension in countries where they operate (Tomlinson, 2017; UNDP, 2017). However, despite the modest improvements in environmental, social, health and safety performance in several IOCs practices over the last few decades in large part because of the enactment and tightening of national environmental legislation and increased public agitation in some host countries, nevertheless, there are still recurring environmental and social impacts associated with the IOCs hydrocarbon drilling exercises. For instance, the attendant deleterious consequences of the IOC's operational activities on the environment and social fabric have been well documented in Nigeria (Adeola, 2022), Chad (Madumere, 2021), Angola (UNDP, 2019), Ghana (Ayelazuno, 2016) and Peru (Acuña, 2015), among others.

Graham and Ovadia (2019) and Obi (2019) argue that there has been a negative perception of multinational oil and gas corporations on environmental stewardship coupled with complex problematic records related to corruption and unsustainable mineral resource exploitation in these petro-states in the global south. Part of the reason is that the major oil corporations boast more powerful lobbyists than the other segments of the business world, enabling them to donate substantial funds to the major political parties in low-income countries with an abundance of hydrocarbon resources to maintain unsustainable practices that are detrimental to environmental integrity (Ngoasong et al., 2014; Tomlinson, 2017; Obi, 2019).

The multi-national oil firms, through their lobby group, strategically influence the petro-states and, in many instances, entice the high-ranking government officials to downplay the enactment of more robust environmental policy that is deemed to be obstructive to their prevailing oil and gas profitable practice regardless of the state of ecological integrity (Obi, 2010; Wenar, 2015). This practice is also prevalent even in the most ostensibly robust democratic systems in the West, which saw the IOCs funding both the democratic and the republican parties in the US to sidestep the environmental policies deemed unfriendly to their hydrocarbon extractive activities (Hamilton et al., 2004). As observed by Grasso (2019) and Supran and Oreskes (2021) in an attempt to defend their prevailing and lucrative business model, the major IOCs – like BP, Chevron, Amoco, Shell,

Texaco and Exxon Mobil used the global climate coalition, which represents a coalition of business entities to promote a campaign for climate denial. These influential IOCs somewhat reign supreme in casting scepticism on the scientific consensus on critical global challenges like climate change and often vehemently opposed environmental policies designed to curb CO₂ emissions occasioned by oil and gas development. This development exerts variation in response to the ecological implication of oil and gas development by the major multi-national oil firms across different geographical jurisdictions (Tomlinson, 2017; Bricout, 2022).

For example, American oil giants like Chevron and ExxonMobil appear to adamantly persist in their denial of the link between their practices and climate change, strongly proclaiming the exorbitant economic cost of addressing the environmental issues, particularly the greenhouse gas (GHG). As such, these companies lobbied against key environmental and climate policies and continue to apply reactive measures to environmental issues and risks in their oil and gas operational activities. In contrast, European oil firms like Shell and BP recognised the scope and scale of environmental impact occasioned by the oil and gas exploration and aligned with the scientific basis of anthropogenic climate change and espoused the principle of precautionary action, although with little practical evidence in terms of their drilling activities and the quality of the environment, particularly in developing countries (Grasso, 2019; Bricout, 2022; Grasso, 2022; BP, 2021; ENI, 2021; McKie, 2019).

2.4.1.4 National oil compnaies (NOCs)

State-owned National oil companies (NOCs) are generally referred to as a firm or entities that wholly or largely belongs to the national government directly or through owning a greater portion of the equity shares in the company (Nolan and Thurber, 2012; Stevens, 2008a; Hartley and Medlock, 2007). Historically, NOCs emerged as a political reaction against what was traditionally perceived as the long-standing exploitation of oil and gas reserves in resource-rich countries by powerful Western-led international oil companies (Noreng, 1993; Victor et al., 2012; Grasso, 2019). The NOC's development was largely spurred by the nationalistic and populism movement that began in 1938 with Mexico's Petroleos Mexicanos (PEMEX) formation. The PEMEX is the first major NOC established

(or branded entity) by a low-income and oil-producing country (i.e. Mexico) in the global south through the seizure of IOC's national assets to appeal to the growing domestic dissatisfaction with the dominance of the Anglo-American oil firms in the country (V́ctor et al., 2012; Aslaksen, 2010; Raḿrez-Cendrero and Paz, 2017 World Bank, 2011). The proliferation of NOCs reached its climax in the 1950s and 1970s, with several developing countries in the Middle East and Latin America, and to some degree, a few African countries endowed with hydrocarbon resources established their NOCs. This trend of natural resource nationalism through state-owned National oil companies is arguably the pivotal turning point that erodes the influence of the IOCs in many oil-producing countries and elevates the state's participation in the oil and gas sector by forming the Organisation of Petroleum Exporting Countries (OPEC) (Marcel, 2006; Mommer, 2002).

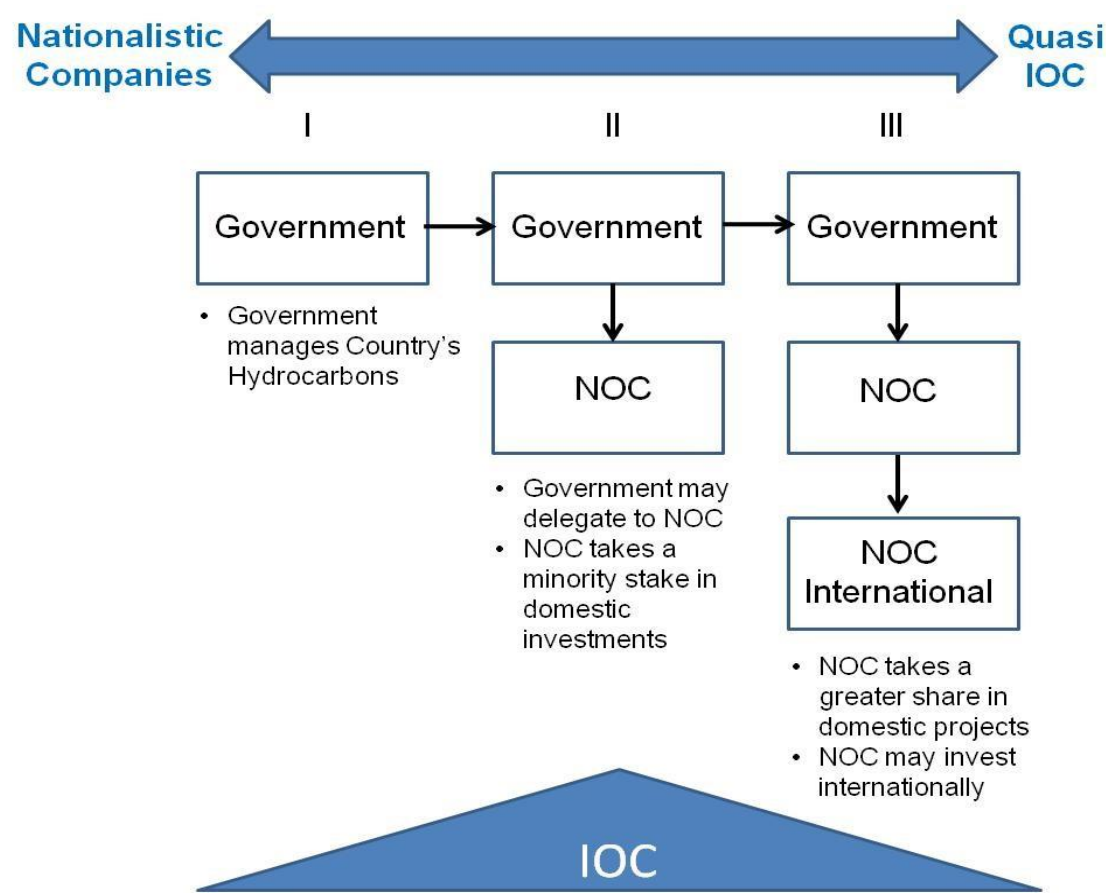
Accordingly, the trend of state-owned NOCs evolution varies from country to country or even continent, although nearly every instance of NOCs formation can be linked to at least one and potentially all of the tripartite factors of politically induced ideology, economic and social factors (Toninelli, 2000; V́ctor et al., 2012; Nem Singh and Chen, 2018). The primary principle objectives of the NOCs, as highlighted by Colgan (2021) and Silva (2020), centred on the need to facilitate the development of the indigenous oil and gas industry in order to wax the flag of sovereignty and national interest to achieve socioeconomic and political development.

Currently, the NOCs control approximately 90% of the global oil and gas reserves and about 75% share of the global production and control of substantial oil and gas infrastructure, unlike in the 1970s when they had access to only 1% of such reserves due to enormous capacity and influence of the IOCs (Tordo, 2011; Bremmer, 2010; Bridge and Billon, 2017; Grasso, 2019; Steven, 2016). Given their size and increasing influence in the global oil and gas industry, the NOC's operational interests have expanded aggressively beyond their national boundaries and are actively competing with the IOCs to acquire and develop new and existing petroleum reserves. According to Bridge and Billon (2017) and Grasso (2019), some NOCS are no longer perceived as operating based on national political interest or logic; instead, they are either principally or simultaneously motivated

by commercial goals mirroring the long-standing broad objective of the IOCs—'resource seeking' rather than 'market seeking' entities.

In a practical sense, while these indigenous oil firms share the same history, they are not homogeneous, and their business portfolio, value chain and market philosophical orientation in various jurisdictions vary significantly. For example, Ledesma (2009) observed that the evolutionary development of several NOCs exhibits distinctive features of entities with international and domestic business investments which almost make them function as an IOC (quasi-IOCs) such as Petronas (Malaysia) to other oil firms which seek solely to promote national interests such as PDVSA (Venezuela) and National Iranian Oil Company (NIOC) (Figure 3.4). The quasi-IOCs arrangement takes the form of a production-sharing agreement, a joint venture, concession or service contract due to acutely limited technical capacity and financial investment. Similarly, Grasso (2019) and Al-Fattah (2013) claim that a valuable differentiation can be made between NOCs that belong to a state with significant hydrocarbon reserves and formed part of the oil exporting blocs and those based in oil-importing countries, often found in Asian regions like China National Petroleum Corporation (CNPC), China National Offshore Oil Corporation (CNOOC) and Oil and Natural Gas Corporation (ONGC, India).

Figure 2.6: Stages in NOC Development



Source: Ledesma (2009)

Moreover, the NOCs are vulnerable to exogenous and endogenous environmental forces. Core among the external factors is economic, political, climate change concerns, socio-cultural and technological (Muhlenkamp, 2015; Victor et al., 2012; Al-Fattah, 2013; Augustynowicz & Kwiatkowski, 2014). For example, it has been argued that the practical decisions and management of the NOC's institutional structure of governance in many developing countries are, to a large extent, politically-driven or decided by the bureaucratic elite in the government, not by the management board (Claes, 2018; Gutiérrez et al., 2021). The government's wholesome bureaucracy intervention in the policy, strategy and operational regulatory and fiscal framework typically constrains the effective integration of the nationalised oil firms in the global market. Empirical evidence indicates that the state's management of the NOCs wholly makes them less viable for attracting investment and capital inflow (Golden and Mahdavi, 2015). Scholars

McPherson (2008), Wolf (2009), Tordo (2011) and Ledesma's (2009) compared the inability of the NOCs in many developing countries to produce substantial crude oil output per unit of labour due to technological deficiency, bad business practices, and avoidance by the foreign investors of a business landscape with high public sector interference or elite pursuing their personal, political and clientage patronage in state-owned oil enterprises.

Another problematic situation that underpins the NOC's institutional governance structure is the state regulatory authorities playing the tripartite role of developer, regulator and enforcer of environmental due diligence in oil and gas development. It is, therefore not unsurprising that a rational discussion to prioritise sustainable environmental management and the social interests of the local inhabitants rarely merits serious government attention due to decisions and actions made based on the economic and political interests of the rich elite in the low-income countries endowed with abundant hydrocarbon resources. As Price (2020) and Obi (2019) reported, the governments in developing countries pay lip service to the plight of the environmental and social impact of oil and gas extraction by the citizens in areas where the NOCs operate. In many instances, the NOCs are deliberately shielded by the regulatory authorities to evade their responsibility and accountability for environmental protection and management and are, therefore not subjected to public accountability or criticism (Grosso, 2019). The IOCs can also leverage upon these apparent loopholes and through their strategic influence and lobby group, facilitate a buy-in clause or way that allows them to seemingly set aside their culpability to the negative environmental impact of oil and gas development in their host countries and in some cases create a perception that addressing environmental impacts or even curbing GHG emissions represent a policy aimed at disrupting their profitable business model which may likely impact the country's revenue and growing their economy (McPherson, 2008; Mehlum et al., 2006; Graham and Ovadia, 2019; Singh, 2007; Grosso, 2019).

2.4.1.5 International and national financial organisations (investors/operators)

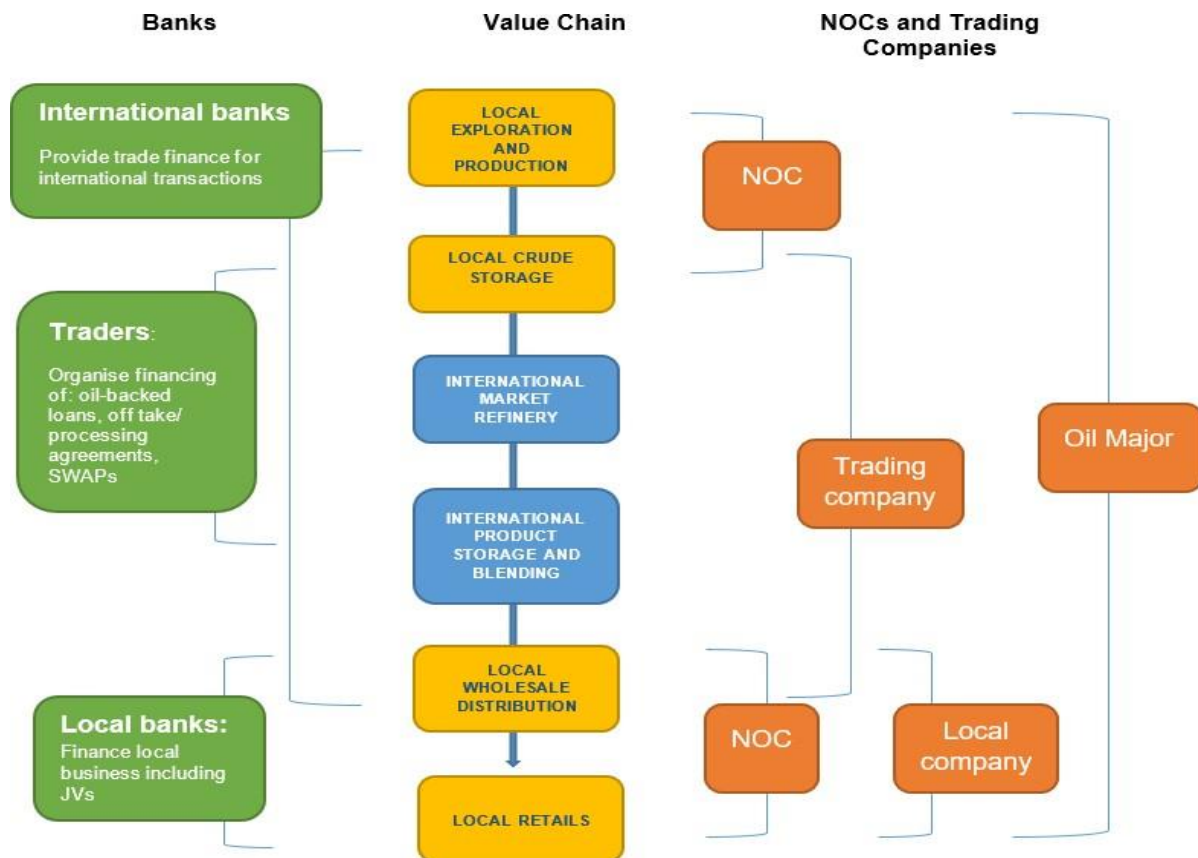
The recourse to capital investment is critical to financing project development in the petroleum industry, which grapples with considerable financial challenges (Abor et al.,

2023). Historically, international oil companies (IOCs) have been the primary financiers of hydrocarbon exploration and production (E&P), midstream infrastructure development, oilfield services and downstream operations, especially in emerging markets and developing economies (Razavi, 1996; Sheppard and Hume, 2016). Energy securitisation has played a significant role in IOC investments, often backed by major petroleum-importing countries to ensure a secure supply of oil and gas commodities (Culp and Forrester, 2009). However, a shift occurred in the late 1970s and early 1980s when oil-producing countries established national oil corporations to exert greater control over their hydrocarbon reserves. This led IOCs to seek financial commitments from national governments, reducing their independent investments (Tafur et al., 2022). This shift has constrained capital availability and national budgets for oil and gas-producing countries, making it more challenging to fund project development amidst competing domestic commitments (Blonigen, 2005; Giwa-Osagie and Ehigiato, 2015). Consequently, sourcing both external and internal investments has become imperative for financing oil and gas projects. To this end, public and private organisations and firms—a group of investors/funders with a hyper-focus on maximising profits —have ventured into the fray. It has been reported that since 2010, for example, the private equity industry has invested at least 1.1 trillion dollars into the energy sector— which is double the combined market value of three of the world's largest energy companies, including Chevron, Exxon and Royal Dutch Shell (New York Times, 2021).

The overwhelming investments play a central role in financing oil and gas project development (International Finance Corporation, 2018; Sara, 2021) and are typically granted through a wide range of financing instruments such as joint venture (JV) partnerships, straight loans, syndicated loans, commercial paper, equity and debt, as well as innovative hybrid financing mechanisms to support oil and gas drilling activities and associated infrastructure projects (Giwa-Osagie and Ehigiato, 2015). Several factors attract private and public capital participation in the oil and gas sector. These include the potential for investors/funders to accrue substantial returns on investment, investment portfolio diversification, stable and mature market, tax incentives, government support, and stimulation of local economic growth. However, most of these factors are related to the increasing demand for energy supply from emerging markets and the rise in oil and

gas prices (OPEC, 2018). In reviewing the scholarship literature, Giwa-Osagie and Ehigiato (2015) identified the advantages of Foreign Direct Investment (FDI) in the oil and gas industry, particularly in countries grappling with human and material gaps, including an opportunity to provide funding for innovative technology, the influx of technical personnel, market access and business connections to draw more financial agreements and commitment and attract potential buyers or partners and improved project development efficiency and cost-effective. The participation of a wide range of financiers in the petroleum sector can help facilitate a culture of project development efficiency and cost-effective due to the insatiable appetite of the public and private investors to ensure efficient business and management decisions triumph over political and clientage patronage that characterised oil and gas industry in many developing countries to maximise returns on investment, cost optimisation and innovative solutions and overall project development and implementation (Sara, 2021).

Figure 2.7: International and national financial organisations in the oil and gas industry



Source: Sara (2021)

Despite the widely acknowledged benefits of public and private investments in the oil and gas sector, there has been an associated concern about the drawbacks of such investments. Investment in oil and gas project development is synonymous with risks. These risks include commercial risks and political risks (Giwa-Osagie and Ehigiato, 2015). Commercial risks entail potential shortfalls in project revenues arising from uncertain sales, fluctuating prices, project delays and cost overruns—all of which lie under the purview of project investors/funders. For instance, market volatility, currency convertibility, non-recourse financing, inflation rates and cyclical price fluctuations affect investors' confidence in financing oil and gas project development, leaving highly dependent nations grappling with considerable financial needs vulnerable to unfriendly conditions imposed by funders and investors. Conversely, political risks involve foreign

exchange volatility, asset expropriation, unequal playing field and civil unrest, which lie beyond the direct control of project funders, often adding complexity to the investment ecosystem and final decisions (Bindemann, 1999; Duan et al., 2018).

Tafur et al. (2022) and Duan et al. (2018) attributed the political risk in the petroleum industry, particularly in developing countries to a lack of well-established legal, institutional and regulatory systems which pose a genuine challenge to equitable policy and decision environment. Another drawback is the potential for conflicting values and disparate objectives or interests between the government and local communities in areas where project development funded by investors is located. These issues often unfold in an attempt to offset and reconcile profit-driven objectives with environmental and social concerns, leading to disagreements or tensions during project development and operation. In particular, equity companies have emerged as increasingly powerful yet secretive investment forces in the oil and gas sector. These entities typically assemble vast pools of funds in order to invest directly in fossil fuel firms within countries in distress and unable to raise capital in a more traditional way and thus operating with a certain degree of confidentiality which can limit the transparency of the oil and gas extraction and development infrastructure project network and may result in limited public oversight and scrutiny—potentially raising concerns about ethical practices or adherence to key objectives of environmental protection and management.

Although the overreaching rationale for and possible benefits that characterised the public and private organisations and equity firms are still deeply entrenched in the business-driven approach that focus on steady returns on investment over and above environmental and social performance, this concept of financialisation of oil and gas project development is increasingly being challenged from an ecological perspective by multilateral and international development organisations like the World Bank and the International Finance Corporation (IFC) (World Bank, 2019; Lawler and Milner, 2005). These mainstream investors and lending organisations are increasingly considering the environmental and social performance of oil corporations in the regions where they operate. Lending requirements facilitated by these organisations are increasingly driven by ethical concerns and the recognition that environmental and social performance can

significantly impact a project's implementation as scheduled and within the budgetary allocation, posing genuine concerns about the overall operational efficiency and long-term financial viability. As a result, accessing capital finance for oil and gas project development is becoming more closely intertwined with the imperative of incorporating ecological rationality into the planning and decision-making processes. Lawler and Milner (2005) observed that the World Bank and the International Finance Corporation have established key criteria and standards, such as Performance Standards 4, which require policies, plans, programmes, and project proposals related to hydrocarbon development to undergo impact assessments. These assessments aim to identify and mitigate environmental consequences associated with development, emphasising the importance of developing effective impact management systems (Buchman, 2012; World Bank, 2019; IFC, 2016).

The insights above suggest, among other things, that regulatory authorities and developers within the petroleum sector are increasingly facing pressure from financial development organisations to adhere to environmental quality standards and demonstrate a commitment to ensuring environmental concerns are identified and considered early in informing decisions at all stages of policy formulation, implementation and monitoring to facilitate a more sustainable development trajectory. The table below provides a comprehensive list of criteria for funding oil and gas development.

2.4.1.6 People and society (non-state actors)

The importance and relevance of the non-state actors (NSAs) in the oil and gas sector become apparent due to the common assumption made by developers and investors that the state's issuance of a hydrocarbon licensing permit signifies the sole objective of a mutually satisfactory end to project-driven stakeholder consultation and engagement. This wholesome traditional approach to the oil and gas decision-making process has, in many cases, resulted in a tug-of-war and or a battle of opposing sides between operators who were given licence approval to extract hydrocarbon resources and the local community members living proximate to the areas where the multi-national oil and gas industry operates, particularly in countries of the global south (Obi, 2019).

Around the world, non-state actors are increasingly raising the stakes for a meaningful and effective representative role to deepen a democratization effect in oil and gas governance to address common issues of interest to the oil-producing communities. These non-state actors include environmental non-governmental organisations (ENGOS), civil society organisations, and professional groups that act as a vector of change to culture and decision processes that rationalise unsustainable decisions and actions in the oil and gas industry and typically exhibit three key distinct features. Firstly, they have a substantial degree of organisation; second, they are autonomous of the state and, third, they draw their membership and legitimacy from the vulnerable section of local communities that are disproportionately affected by oil and gas development initiatives in their regions (Aaronson, 2011; World Bank, 2019; Buchman, 2012).

As opposed to having disjointed and unorganised local communities who often congregate and portray themselves as weak and victims of the negative impact of oil and gas development and unfair and unjust treatment from the oil companies and the laissez-faire attitude of the government toward their plight and disposition, the non-state actors are well-organised groups that can act as a force for change in the oil and gas governance to compel the key decision-makers to ensure that hydrocarbon extraction and production are environmentally friendly and result in tangible and intangible economic and social development for local communities—the opposite of the resource curse (Obi, 2015). The moral disposition of the non-state actors on petroleum governance allows them to play a central role in agenda setting, publicity, networking, lobbying, conferring legitimacy, negotiating outcomes, implementing solutions and, in some extreme cases, litigation against the polluting oil and gas industry who have usually known to hide behind governments discretionary authority.

As a collective interest and pressure group, the non-state actors can demand accountability in how major oil and gas project development is designed, analysed and managed and the degree to which the potential environmental consequences and social performance associated with such development are transparently communicated to the public. Core to the non-state actor's approach is the sustained advocacy for participative planning that acknowledges and embraces the existence and interest of the local

communities to facilitate a reflexive approach to oil and gas policy and decision-making through communication, negotiation and compromise with oil companies (). This involves creating a collaborative platform in which the non-state actors can simultaneously remain key participants and advisors in project planning and design, raising awareness of environmental issues and underlying goals and values of the affected communities, helping to amplify the willingness of the oil companies and decision-makers to address such issues in policy formulation and implementation.

Through dialogue, deliberation and consensus, NSAs can be instrumental in improving the accountability of environmental planning and assessment and involved governments, filling existing information and knowledge gaps about the local community population, their history and current environmental issues as they mostly have high expertise in addressing environmental and sustainability issues on various levels, particularly in the impact assessment reviews related to a wide range of development initiatives such proposed oil and gas project development that require environmental and social impact assessments (ESIAs). They can help facilitate opportunities for multi-level governance to ensure procedural environmental justice is adhered to in formulating mitigation measures to help improve and fine-tune the environmental and social aspects of the proposed oil and gas project design and development. In principle, the outcomes of such a consultative process will help establish a basis for whether oil and gas project development has adequately integrated views and expectations of the vulnerable communities before the government eventually issues licenses for oil and gas drilling activities.

The non-state actors also have a monitoring role that can affect resource governance accountability. As watchdogs, the NSAs can influence oil companies to adhere to the accepted environmental justice rules in oil and gas extraction and production and ensure they comply with formal laws and internationally accepted standards of fair behaviour. Beyond this, they can be interested in the conduct of government officials and oil firms within the petroleum governance and use information channels to expose monopolistic power and discretionary authority to stop corruption and other negative behaviours. The glaring impact of the NSAs in environmental matters related to oil and gas extraction is

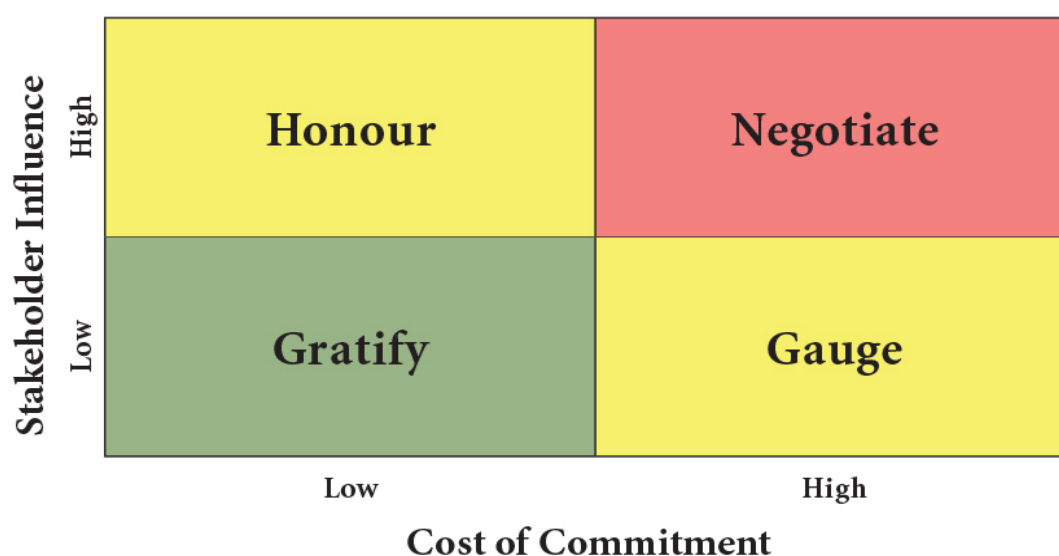
notably exemplified by the May 2021 ruling of the Hague Court in response to a lawsuit filed by Environmental NGOs on behalf of the oil-producing communities in Nigeria's Niger Delta region against Shell, which is regarded as one of the most powerful transnational oil company in the world. The court's judgment mandates that Shell reduce its CO₂ emissions by 45 per cent, relative to 2019 levels, by 2030. This legal fallout is a compelling illustration of the substantial impact NSAs can have, underscoring the increasing role of environmental considerations within society at large and the potential influence that NSAs can wield, even in their interactions with major corporations.

However, some scholars have argued that even though the NSAs are crucial in oil and gas governance, particularly in the impact assessments and reviews, there are associated concerns with regard to procedural justice in the representation. Critics highlighted three common issues regarding the legitimacy of NGOs to act as representatives. Firstly, the NSAs may exaggerate their capacity to represent community interests and concerns or even pursue other agendas in the policy design and implementation; secondly, their participation may not lead to equitable and fair representation; and thirdly, their involvement lacks democratic legitimacy and not necessarily yield the much-touted potential outcome (Lai and Hamilton 2020). Madumere (2021) developed a 'Stakeholder Influence Vs Cost of Commitment Matrix' framework that guides and informs the decisions of oil companies on how to effectively and directly engage host communities to establish a new benchmark of consultation, engagement and transparency for both parties to better understand the interdependencies that exist between them. Within this framework, the "Gratify" approach can be applied when a stakeholder has relatively low influence over oil and gas project development or operations and the costs associated with meeting their expectations are minimal. The "Gratify" approach involves promptly addressing the stakeholder's concerns and fulfilling their expectations as they arise, recognizing that their involvement, while not highly influential, may still impact the project.

Conversely, the "Honour" approach can be instrumental when a stakeholder of significant influence is at stake and the cost of fulfilling their expectations is relatively low. This approach involves dealing with such stakeholders with the utmost recognition

and respect, acknowledging the potential substantial impact of their actions on oil and gas development. In such cases, it is highly recommended not only to meet or surpass stakeholders' expectations but also to gain their trust, support and commitment to the project's success. The "Gauge" approach is best suited for situations involving stakeholders with limited influence but where the cost of meeting their expectations is high. In this approach, the oil companies can identify and prioritise the concerns expressed by the stakeholder, assessing their resources and capabilities to address the major concerns. The goal is to effectively manage stakeholder expectations while addressing significant issues and demonstrating respect for their concerns. Finally, the "Negotiate" approach is employed when dealing with stakeholders who wield substantial influence over the hydrocarbon project or operation, and the cost of meeting their expectations is high. In this scenario, appropriate negotiation and collaboration with the stakeholders are essential (See Figure 2.8). The focus is on establishing common ground, fostering an understanding of interdependencies between parties, building trust, and facilitating the successful execution of the oil and gas project development (Madumere, 2021).

Figure 2.8: Stakeholder Influence Vs Cost of Commitment Matrix in oil and gas decision-making



Source: adapted from Madumere (2021)

2.5 Global environmental impacts of oil and gas exploration and production

The oil and gas sector is of central importance in shaping societal and national development, but it cannot be ignored that it is still one of the most polluting industries in the world (Kark et al., 2015). For the most part, hydrocarbon extraction and production have remained the same over the last decades, although technological advancement may differ across different jurisdictions: onshore, offshore-based or synthetic drilling that ensures fluid circulation within the drilling string of the drill bit, shale as well as Arctic exploration (Cordes et al., 2016). According to the E&P Forum/UNEP Report (1997), the scale and complexities of pollution due to hydrocarbon extraction vary at different levels, as well as the sensitivity and regional characteristics of the operations areas or regions. The exploratory drilling is undertaken to reveal the subsurface of the geological fabric to confirm the existence of hydrocarbon accumulation in the site and its capacity to produce a substantial quantum of oil and gas to make it economically viable to merit further government attention or investment (Zabbey et al., 2021).

The alteration of landscape environments in search of hydrocarbon liquids typically unleashed significant destabilisation of sedimentary formation, drill cuttings and drilling fluids, generating a global volume of approximately 39.5 Mm³ of produced water per day from oil and gas drilling activities or fields (Jiménez et al., 2018) and more than 40% of this complex wastewater is released into marine ecology (E&P Forum/UNEP, 1997; Fakhrul'I-Razi et al., 2009; Igunnu and Chen, 2012; Kabyl et al., 2020). Produced water (PW) often contains traces of various metals, volatile and semi-volatile hydrocarbon contaminants, chemicals, dissolved salts and organic compounds and other associated chemical fragments that have a spatial impact on the land and marine environment. According to Igunnu and Chen (2014), these wastewater and harmful substances emanate from onshore and offshore oil and gas reservoirs through the oil rigs and distillation plants and often tend to accumulate and leech into the freshwater and coastal shorelines (See Figure 2.9). The effects of effluent discharge into marine ecosystems have been well documented in the literature (Neff, 2000; DeLeo et al., 2016; DeLaune et al., 1998; Onyena and Sam, 2020). According to DeLeo et al. (2016) and Kabyl et al. (2020), the chemical contamination of surface water tends to dissolve, evaporate and oxidise into the marine environment, thereby leading to long-term and acute exposure that poses a significant

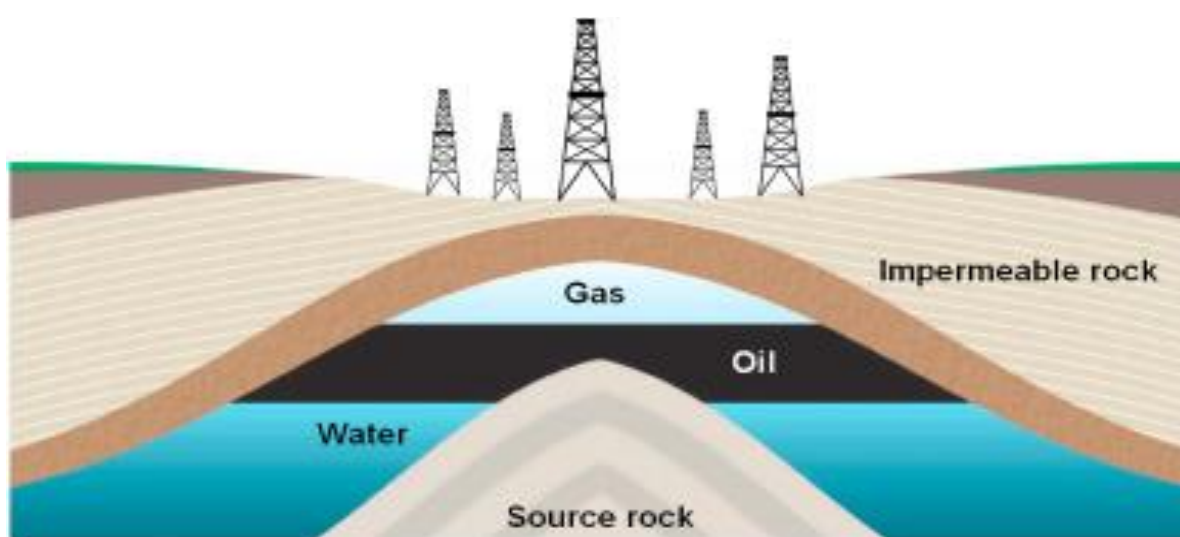
threat to aquatic creatures such as fish and seabirds. Miller et al. (2020), in concurring with this view, further note that the extent of environmental implications of produced water on wetlands is significantly influenced by: (1) the rate of discharge, (2) the quantity of the hydrocarbons and fragments of chemicals or metals associated with a particular discharge, (3) local hydrological settings, (4) sediment excavation or disturbances and (5) sediment organic carbon formation.

Moreover, on a global scale, the impacts of chemical contamination associated with the oil and gas sector can be seen based on several shreds of evidence from the Torrey Canyon in the English Channel (1967), Buzzards Bay in Florida (1969), the Santa Barbara Channel oil spill in California (1969), the Gulf of Mexico (2010) all in the US, Bodo oil spill in Nigeria (2008), Black Sea oil spill near Tuapse, Russia (2014), Callao oil spill in Ventanilla District, Callao, Peru (2022) and the most recent oil spill in Wytch Farm, Poole Harbour, Dorset in the United Kingdom (2023) (MacDonald et al., 2015; Chanton et al., 2014; Henkel et al., 2012; Haney et al., 2017). In particular, the US Fish and Wildlife Services (2013) found that hazardous chemical spillages into the Deepwater Horizon leached into the Gulf of Mexico for 87 days, polluting 1,300 miles of coastline in over five states along the coast, which caused severe impacts on the coastal marine creatures and seabirds and human well-being (US Fish and Wildlife Services, 2013). These high-profile cases demonstrate that oil spillage accidents or discharges have been an ongoing global problem throughout the decades. Although, it is crucial to emphasise that incidents of oil spills or discharges can occur at any stage in the "life cycle" of hydrocarbon development—from exploratory drilling, production and operations involving transporting crude via pipeline, vessel, tanker truck or railroad, refining; storage in flow station, consumption as fuel or its application as raw material for manufacturing or even due to sabotage by the unscrupulous individual, particularly in the developing countries (Zabbey et al., 2017; Onyena and Sam, 2020).

Nevertheless, the spatial hazardous chemical spillages alter the biochemical and physio-chemical fertility of the land proximate to the exploration frontiers. The salts absorbed by the soil from oil spills negatively influence the water-retaining capacity of the soil, induce the soil to repel water and block soil pores, affecting the flow of water and

indirectly impacting a variety of crops and plants. Research conducted by Zhao et al. (2020) and Barron et al. (2020) found that soil proximate to oil spillage sites often experiences soil acidification which triggers the loss of soil fertility and its capacity for agricultural activities. Their findings indicate that oil spillage negatively impacts the surrounding landscape, inflecting short and long-term hazards to the vegetation belts.

Figure. 2.9: Typical representation of oil and gas reservoir



Source: Igunnu and Chen (2014)

The perceived causes of environmental and social impacts from the oil and gas sector also include extensive land degradation, ecosystem devastation, deforestation and human displacement. Several studies related to the effects of oil and gas development, particularly in developing countries have revealed that while the importance of hydrocarbon resources is overwhelmingly evident, there has been considerable concern over the enormous environmental consequences on indigenous people in the host communities and the perceived synergistic effects on the broader biogeographical proximate to drilling areas. A report by the European Parliament (2011) noted that oil and gas exploration activities pose myriad socio-economic consequences to sub-Saharan African countries. Graham and Ovadia (2019) reveal that indigenous farmers living near oil and gas development fields often lose their crops and the fertility of the land to hydrocarbon drilling activities. Thus Nigeria represents an excellent example where for

instance, the hydrocarbon activities in the Niger Delta region have created an imbalance in the socio-economic fabric of the inhabitants of that region. Scholars such as Sam et al. (2017) and Onyena and Sam (2020) found that agricultural farmlands in Nigeria's Niger Delta region are dispositionally impacted due to runoff from the frontier of crude oil deposits, thus altering fertile soils into wastelands.

Another strand of the challenge posed by the exploration of petroleum activities is gas flaring, which has become a common practice by oil companies over the years, leading to greenhouse gas emissions with far-reaching consequences on the well-being of the inhabitants. Greenhouse gas emissions, particularly carbon dioxide (CO₂) emissions from oil and gas exploration, have been identified as the principal cause of the observed change in global climate change (Jiang et al., 2020; Alley et al., 2003; Wilson and Staffell, 2018) which has become one of the biggest environmental threats to the global community (Intergovernmental Panel on Climate Change, 2007; 2014). The IEA report indicates that greenhouse gas emissions have increased by more than two-thirds since 1995, and the atmospheric concentration of these gases has increased rapidly to about 435 particles per million carbon-dioxide equivalents in 2012, and if immediate action is not taken, the scourge of climate change will increasingly pose a severe and irreversible impact to the global community (IEA, 2015). The combustible particles caused by gas flaring emit a considerable quantum of sulphur oxides, methane, and other gases contributing to various environmental consequences. The concentration of the acid rain produced by the gas flaring pollutes or alters the microclimate condition and physical and chemical characteristics and often causes variation in turbidity, biological oxygen and increased PH level (Shaibu and Weli, 2017; Aregbe, 2017).

Agumagu et al. (2018) established compelling evidence based on the scientific data that shows petroleum exploration, production, and operations are critical contributors to the rise in mean sea level due to the release of greenhouse gases. The satellite data on gas flaring released in 2020 shows that Russia, Iraq, Iran, the United States, Algeria, Venezuela and Nigeria accounted for the biggest gas flaring emission through fossil fuel extraction for nine consecutive years (Odjugo and Osemwenkhae, 2009; Alola et al., 2023). The report further states that greenhouse gases such as CO₂, sulphur and

methane emissions will likely increase due to oil and gas-driven demand supply and consumption. However, some developed countries have done a lot to curb the effects of gas flaring and transform it into economic gains. For instance, Norway has adopted gas flaring reduction measures through carbon taxing of the multi-national oil firms compared to the developing countries, whose strategies seem ineffective and disappointing (World Bank, 2014; Ite and Ibok, 2013).

The US Environmental Protection Agency (EPA) reported that releasing CO₂, methane, and other related gases produced during flaring or venting oil and gas production activities is hazardous to human health. Edino et al. (2010) established that gas flaring threatens the health and general well-being of the local inhabitants who live near exploratory frontiers. Exposure to a wide range of gaseous substances from the gas flaring causes chronic human illnesses, such as cardiovascular disorders and acute disorders like leukaemia, asthma, and heart attack among the inhabitants of oil and gas host communities (Collins and Oshod, 2010; Sengul et al., 2012; Kelishadi 2012) and contributes to and premature deaths annually, especially in developing countries. Cordes et al. (2016) admitted that the expansion and long-term hydrocarbon development present severe impacts on the biophysical environment and may induce complex challenges to sustainability, which pose a more significant challenge to the policy decision-makers.

Finally, Ordinioha and Brisibe (2013) unearthed that the adverse impact of hydrocarbon drilling activities causes about a 60 per cent decrease in household food security, the amount of ascorbic acid in vegetables by up to 36 per cent and the dietary protein composition of cassava by up to 40 per cent, culminating in a 24 per cent surge in the prevalence of child malnutrition. A study conducted by AFP (2013) revealed that oil and gas exploration in the Amazon basins in South America caused significant ecological degradation and socio-economic imbalance among the inhabitants of Ecuador's frontier basins. This has sparked outrage among the people, culminating in a lawsuit against Chevron Oil firm demanding more meaningful compensation for environmental damage caused by the oil exploration.

2.6 Management of adverse impacts of oil and gas development

The effects of oil and gas exploration production operations on the environment can be managed through a variety of environmental decision-support instruments. These decision-support instruments are central in shaping how oil and gas planning and development decisions proceed and, in turn, can have significant implications for sustainability (Lamorgese et al., 2015). At the most general level, two main disseminated decision-support instruments are prominent in the oil and gas sector: the environmental impact assessment (EIA) and strategic environmental assessment (SEA). These approaches are not mutually exclusive and therefore can co-exist or complement each other. The following sections outline the role of EIA and SEA in oil and gas environmental decision-making.

2.6.1 Environmental Impacts Assessment

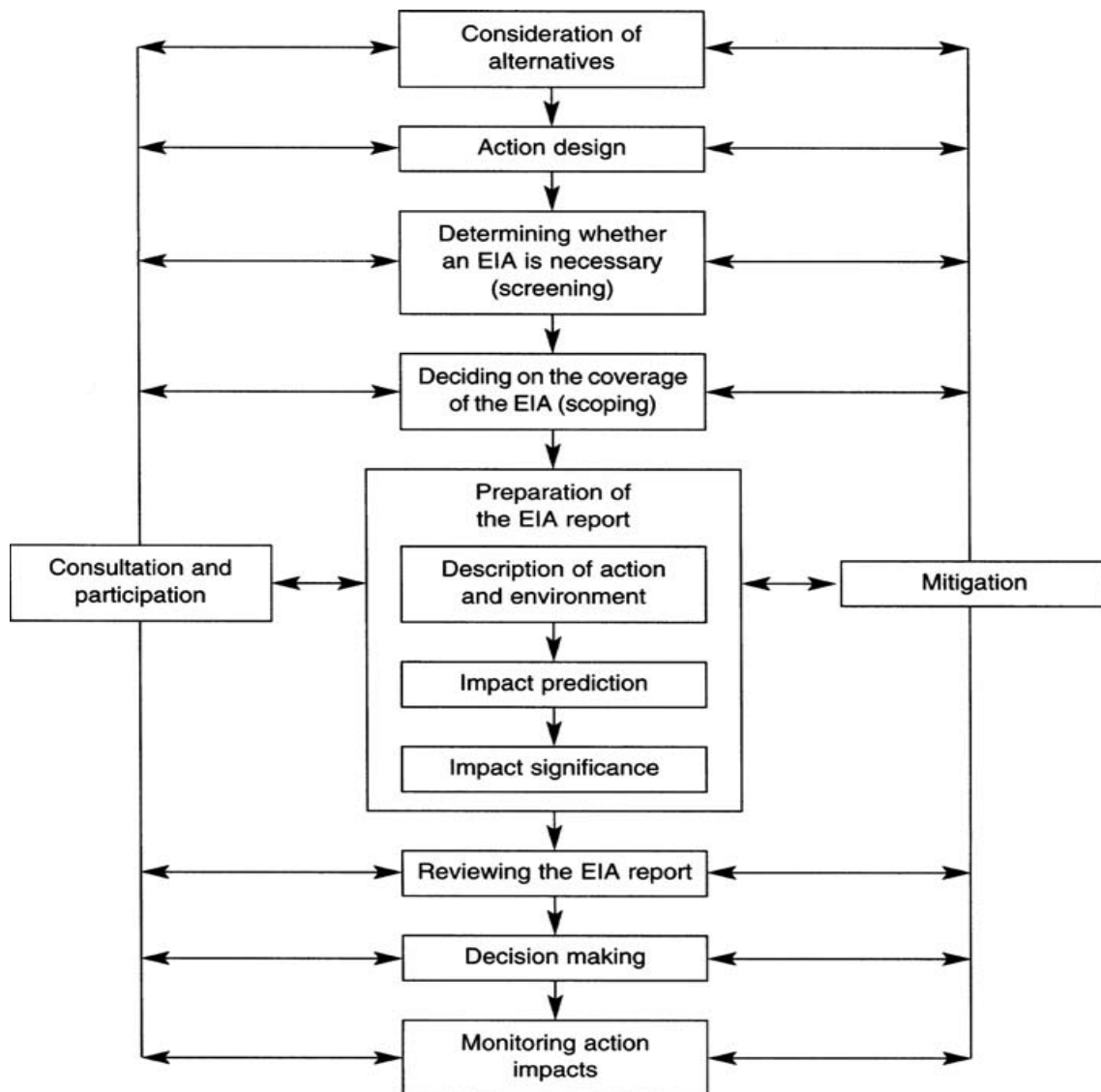
The EIA is a project-specific tool designed to foresee and predict the potential environmental effects of proposed projects before their approval or commencement (Jay et al., 2007; Cashmore et al., 2004). It is often applied as the first major step in developing anticipatory environmental management measures to ensure the minimisation, prevention or avoidance of the consequences of development action (Gazzola, 2022). The underlying intent of the EIA is to provide much-grounded evidentiary information regarding project development to the decision-makers, communities and developers to have a greater understanding of the potential impact of a project proposal (e.g. crude oil refineries, pipelines) at an early stage to increase the benefits and minimise the environmental impacts of development action through rational and systematic recommendations for mitigation conditions that must be fulfilled before any commitment to a particular course of action becomes a reality (Briffett, 1999; Glasson and Therivel, 2013).

Emerging from the United States National Environmental Policy Act of 1969, which later became law in 1970, the EIA is widely recognised as an innovation in environmental governance (Caldwell, 1988; Kidd and Fischer, 2007). Over time, the EIA has evolved to become one of the oldest and only a few environmental policy tools firmly established in legislative, regulatory and policy frameworks in many countries around the world

(Sinclair et al., 2018; Morgan, 2012). Under the existing legal framework—comprising laws, regulations, procedures, and guidelines—the EIA process is formally integrated into the decision-making process for oil and gas projects. These legal arrangements define the rules and steps for conducting EIAs, particularly when evaluating development proposals with the potential to significantly impact the environment. In theory, the EIA process helps set the terms and conditions required to mitigate these environmental effects, thereby ensuring that potential risks are addressed before project authorization is granted.

The EIA is a component of granting permission for, and the licensing of, oil and gas exploration and development and environmental management in several countries around the globe, such as the United Kingdom, USA and Canada (Budd, 1999; Baker and Jones, 2013). The EIA is often applied as the first major step in developing anticipatory environmental management measures to ensure the minimisation, prevention or avoidance of the consequences of development action. The underlying intent of the EIA is to provide much-grounded evidentiary information regarding project development to the decision-makers, communities and developers to have a greater understanding of the potential impact of a project proposal at an early stage to increase the benefits and minimise the environmental impacts of development action through rational and systematic recommendations for mitigation conditions that must be fulfilled before any commitment to a particular course of action becomes a reality (Wood, 2003).

Figure 2.10: Diagram of the generic EIA process



Sources: Wood (2003)

The iterative stages highlighted above typically serve as a reference point for regulators and developers to facilitate the effective implementation of the EIA process, at least in theory, these stages are intended to be applied as early as possible when project development proposals are being conceived and designed by the proponents. Glasson (2008) suggested that the EIA process should be initiated at the project conceptual design phase and run throughout the whole project planning and decision cycle and, in accordance with best practice, should engage relevant stakeholders who may be directly

impacted by the proposed project or have a vested interest in its environmental implications. Morrison-Saunders and Arts (2012) describe screening as the early and crucial step of the EIA process that can determine whether a proposed project requires an EIA depending on their respective environmental impacts. In the same vein, scoping, for instance, has been described as the stage that determines the scale, scope, and nature of project impact. It defines the Terms of Reference (TOR) for EIA preparation, outlines the key questions and concerns that need to be answered, and provides a basis for informed decision-making. The outcome of the EIA process are articulated and documented in the Environmental Impact Statement (EIS).

In the oil and gas industry, for instance, the information generated by the EIA process plays a crucial role in various regulatory activities, including hydrocarbon licensing, consent, and environmental decision-making by relevant authorities. It can significantly influence the regulatory decisions made by these authorities, particularly regarding modifications to the project and the final authorization outcomes (Baker and Jones, 2013). Furthermore, the EIA process can also shape the developer's choices concerning project design, site selection, and the environmental considerations that must be addressed. Consequently, the primary objective of the EIA is to facilitate informed decision-making. This encompasses not only the initial decision regarding the approval or rejection of an oil and gas development proposal but also the ongoing decisions that arise throughout the EIA process, from the initial stages of development proposals to the subsequent follow-up during the project implementation phase (Anifowose et al., 2016).

2.6.2 Empirical influence of EIA in decision making

The intractability of environmental and sustainability issues associated with the oil and gas exploration and production activities have continued to become increasingly significant, and coupled with the evolving priorities in environmental management plans and strategies, the decision-making authority and proponents within the petroleum sector have found themselves compelled over the last decades in an attempt to respond to those complex societal problems—adopting EIA as a decision-support tool (Horvath and Barnes, 2004; Cordes et al., 2016). The EIA, most significantly, is the oldest and only a few established regulatory and precautionary tool in many oil-rich countries by which

potentially adverse environmental consequences of pre-determined oil and gas project development on the biophysical and human environment can be preemptively mitigated and prevented (Aung et al., 2017) and in principle can help facilitate a balance between hydrocarbon extraction and the protection of the environment (Ingelson and Nwapi, 2014; Anthonia and Hope, 2021). The EIA is increasingly perceived as an instrument that can help provide much-grounded evidentiary information to assess oil and gas project-scale impacts on the biophysical environment and may also include consideration of socio-economic effects, enabling the competent regulatory authority to make rational and systematic decisions regarding project development approval and also identify and recommend the condition that must be fulfilled before any commitment to a particular course of action.

Accordingly, EIA can also provide a platform for negotiation between the proponent, affected groups and regulators to address key environmental issues related to seismic and drilling field operations, construction of major oil and gas pipeline routes, petroleum refineries, flow stations, fuel depots and terminals vis-à-vis their location, design, technology, process and alternatives at the pre-development stage and where it is deemed necessary certain modifications are considered to help improve the environmental and social aspects of the project development and design which often involve the preparation of a detailed EIS as part of environmental due diligence to outline appropriate and relevant measures to avoid, minimise or offset the irreversible and costly environmental consequences at the implementation phase (Solodyankina and Koeppel, 2009; Anifowose et al., 2016).

In practice, the added-value of EIA in the oil and gas sector has been demonstrated by various studies. Budd (1999), for example, highlighted the contribution made by the EIAs undertaken in the United Kingdom related to offshore hydrocarbon development and found that the process contributes toward a better understanding of the environmental consequences of oil and gas project development on the marine environment in the North Sea region on the part of the competent regulatory authority and the proponent and appreciation of the relative merits to formulate appropriate mitigation measures to ameliorate the identified significant impacts and enhanced the positive effects.

Similarly, Anifowose et al. (2016) analysed the findings of empirical research regarding the contribution of EIA in the oil and gas planning and development in Nigeria and found that the analyses of environmental impacts associated with hydrocarbon extraction and production did not play an instrumental role in design decisions; and that EIA, rather than enabling a comprehensive evaluation of various alternatives, merely assisted decision-makers superficially to reduce the negative consequences of development and maximise the benefits. Moreover, through a qualitative mechanism, Leknes (2001) evaluated the perception of EIA practitioners, regulatory authorities, developers, and subsidiary stakeholders regarding the role of EIA in oil and gas project development approval for Norwegian continental shelf exploration between 1985 and 1997. Their findings have generally found that EIA was perceived as having a direct and positive effect in assessing and modifying a proposed oil and gas development project to improve its environmental and social aspects before the regulatory authorities make informed decisions regarding the issuance of licensing permits for hydrocarbon drilling activities. In cases where the drawbacks of oil and gas project development outweighed the benefits, certain areas were not approved for installation of the network of petroleum infrastructure, and special restrictions were imposed to limit conflicts between environmental concerns and marine commercial activities.

Kasimbazi (2012) review of the EIA implementation in Uganda's petroleum sector found that the process had a positive effect in providing the opportunity for the developers to draw together an evaluation of the potential significant environmental impacts of oil and gas project development and also helped ensure that the importance of these predicted impacts and the scope of mitigation measures in preventing or reducing them are properly understood by the proponents and local stakeholders before the National Environment Management Authority make an eventual decision about the oil and gas development approval. In recognition of the centrality of the EIA procedure to the oil and gas environmental management, Vilardo and Rovere (2018) identified the strengths of EIA in the Brazilian pre-salt province as its help in ensuring that the scope and significance of potential environmental ramifications of oil and gas project development are comprehensively accounted for by the developers, incorporation of local knowledge

to develop acceptable environmental management strategies and the use of EIA as a learning tool in the decision-making process. In their study, Salter and Ford (2000) further drew attention to the utility of the EIA process in promoting stakeholder awareness and improved environmental transparency in oil and gas decision-making.

However, there is a reasonably broad viewpoint held by several authors that even though the project-level EIA plays a central role in ensuring that potential adverse environmental consequences of oil and gas project development are mitigated before project implementation, the EIA has its longstanding and recognised limitations (Wright et al., 2013; Anifowose et al., 2016; Vilaro and Rovere, 2018; Prideaux and Prideaux, 2016; Fidler and Noble, 2012). The project-level EIA cannot effectively facilitate a sound basis for informed oil and gas decision-making that can lead to environmental protection for several plausible reasons. Firstly, the EIA process is narrowly focused on individual oil and gas project development activity and is centred on mitigating the potential impact of proposed hydrocarbon development. Secondly, it does not adequately consider cumulative, synergistic and regional environmental issues associated with oil and gas exploration and production, including project sites, processes and alternatives. Thirdly, because of its reactionary approach to decision-making and impact assessment after strategic actions and commitments have already been taken at the highest level of policy design, EIA implementation in the oil and gas sector typically reacts to project development proposals rather than preemptively anticipate them (Aung et al., 2017; Noble et al., 2013). For instance, in their review of the performance of EIA in the oil and gas sector in the United Kingdom, Baker and Jones (2013) noted that despite its much-anticipated benefits in informing and improving decisions about individual project development, EIA has exclusively focused on the short-term and direct environmental impact of hydrocarbon project development that can be assessed or predicted more easily as opposed to articulating complex and long-term cumulative environmental effects across transboundary or spatial scales as well as alternative locations for oil and gas development activity so as to avoid sensitive marine environment.

A similar study undertaken by the World Wildlife Fund (2005) has found that although EIA was useful from the developer's point of view, particularly in providing the means of

informing the environmental cost of the Baku–Tbilisi–Ceyhan offshore oil and gas pipeline project, which stretches from the Caspian Sea to the Turkish Mediterranean coast and Sakhalin II, a system of offshore oil and gas platforms and pipelines off Russia's Pacific coast, however, in comparison to the extensive network of such infrastructure development, the sites and processes of the projects have been decided upon before the EIA was commenced and as such regional-scale and cumulative ecological consequences and alternatives were not adequately considered.

Kinn (1999) further reported EIA limitations within the Norwegian oil and gas regulatory system and found considerable evidence that the EIA primarily focused on the specific environmental consequences of the oil and gas development field within a snapshot of a limited geographical setting, highlighting EIA's weakness in articulating for cumulative and regional impacts on the entire designated frontier basin region of hydrocarbon development. Harriman and Noble (2008) have raised the issue of EIA implementation in the Terra Nova Offshore Oil Field in Newfoundland, Canada, stressing that there was little attention in the assessment in terms of regional and cumulative impacts of oil and gas project development on the ecosystem in the region in light of the imminent discovery of more hydrocarbon reserves.

Similar trends of EIA limitations in the petroleum sector to those highlighted by the above scholars have also been noted by Fasina (2016), Aung et al. (2017) and Vilardo et al. (2020) in Nigeria, Myanmar and Brazil. Their findings revealed that the project-based regulatory approach is not well-suited for integrating environmental considerations at the earliest possible stage of decision-making since its influence remains significantly at the lower end of the broader environmental governance planning and decision-making spectrum and is characterised by one way of channelling environmental information about the attributes of oil and gas project development and design process to be an effective means to promote sustainability objectives.

Emerging from these trailing studies is the recognition that project-level EIA is merely helpful in the petroleum industry by compelling the regulatory authorities and developers to focus on mitigating the potential effects of individual priority oil and gas

projects portfolio within a pre-determined policy and planning context since key strategic decisions have been articulated at the upstream level of decision-making. In practice, therefore, the EIA tends to focus exclusively on “best worst-case” scenario based on narrow technical appraisal in which key environmental and social factors that can lead to sustainability outcomes may likely be overlooked or, limited to means of ensuring the implementation of an already proposed course of actions. It cannot therefore facilitate an integrated assessment of cumulative, synergistic (or antagonistic) impacts of oil and gas multi-project development activities and comparisons across alternatives of those sub-programme activities that are not co-located in the same regional or geographical space but share the same strategic policy, plan and programmes objectives can be almost difficult to perform by the traditional EIA procedure. Indeed, the cumulative and secondary impact that may exceed the threshold sum of individual project implications must be examined to achieve broader oil and gas development objectives, such as sustainability.

Another common failing of the EIA approach in the petroleum sector is related to the lack of public engagement and consultation and the incorporation of local forms of knowledge in the decision-making process. Reflecting on the purported failings of EIA in facilitating accountability and fairness in environmental decision-making related to oil and gas project development, Aung et al. (2019) reported that EIAs undertaken for Sino-Myanmar oil and gas pipelines focus more on bureaucratic elites and expert knowledge rather than incorporating the local aboriginal inhabitants in the decision-making process. The author noted that even in cases where a participatory process is envisaged, for instance, local approaches or indigenous techniques that may be used in an EIAs are often overshadowed by procedures selected by experts and methods that employ traditional and local forms of knowledge and public commentary are not always integrated into the decision-making since key decisions are already taken prior to triggering an EIA at a project level. A similar issue was reported by Yakubu (2018), who evaluated the practice of EIA in the oil and gas development in the Permian Basin, which sits partly in West Texas and Southeastern New Mexico, focusing on public consultation and engagement. His work, for instance, found that the regulatory authorities and developers demonstrated an inability to engage the local citizens through the EIA review

process and the subsequent follow-up—implying that the EIA has fallen short of its ideals in promoting local engagement and consultation and monitoring and follow-up. A comparable investigation carried out by Tottimeh (2017) within the oil and gas retail sectors of Sekondi-Takoradi, Ghana, also identified difficulties related to the EIA process.

2.6.3 EIA and governance issues in the oil and gas industry

When EIA was initially established, it was broadly seen as an innovation in environmental governance mechanism intended to provide decision-makers and planners, including the general public, with an opportunity to assess the potential environmental impacts associated with major project development proposals based on evidentiary environmental information (Caldwell, 1983; Kidd and Fischer, 2007; Richardson and Cashmore, 2011). However, Weston (2000) argued that decision-making in policy planning and consequences in the EIA process is inherently political in nature. Politics, of course, is not just about elections or even parties, but politics which occur within and between governance and the institutional environment surrounding the decision-making process: the politics of actor and stakeholder relations and organisational power dynamic. It has been argued that the political dynamics significantly underlie the behaviour and conduct of regulatory actors in the EIA governance system (Kørnøv and Thissen, 2000), and the degree to which environmental considerations are prioritised in the decision-making process hinges largely on the specific actors involved, their vested interests, their relative positions of influence, and the extent to which the most influential decision-makers are receptive or open to integrating environmental concerns into the decision-making process (Arts et al. 2012).

It has been suggested that the governance issues have characterised the EIA practice in the oil and gas industry in several jurisdictions due to divergent expectations regarding the intended outcomes of the process and a lack of interest in considering or implementing the EIA recommendations or findings that may not align with political expediency. Under certain political circumstances, even while environmental considerations may form part of the formal requirement of the EIA system and may even merit consideration as an agenda for deliberation, the role of EIA in decision-making is reduced as political and economic exigencies increase. According to Lekens (2001) and

Mwanyoka et al. (2019), apart from the inherent reactive nature of the project-based EIA, which generally has been unable to deter the implementation of oil and gas projects with environmentally hazardous impacts from ecologically sensitive environment, the EIA is merely used as a cosmetic instrument to embellish project development in which the EIA exercise only serves to elevate the interest of the elites responsible for environmental planning and management decisions and developers such as the oil and gas companies. The key factor perpetuating this practice is that EIA practice is the prevailing common-control approach, concentration of powers and the discretionary role of the government actors in the EIA governance system (Williams and Dupuy, 201; Emeseh, 2012; Ingelson and Nwapi, 2014). Such entrenched habits and practices within the EIA governance regime compartmentalised decision-making space to prioritise 'quick and dirty' assessments driven by corrupt practices and conflict of interest, rationalising controversial decisions or negative EIA resolutions and further exacerbating environmental management problems.

Eneh (2011), Emeseh (2012) and Ambituuni et al. (2014) reported that EIA practice in Nigeria's oil and gas sector often wrestle with power dynamics and politics determine the direction of environmental policy decisions and an environmental governance context that is adverse to sound and informed decision-making about oil and gas development. Mwanika et al. (2019) further add that the EIA regime and practices in the natural extraction industry in developing countries such as Africa have become deeply encultured by a dominant vested interest in which the interests of the powerful actors determine EIA outcome. These practices, however, have environmental implications such as pollution and land degradation. In his analysis of the transition governance model in the Dutch energy sector, Kern (2009, p. 122) pointed out that "captured decision space" by technocratic incumbent actors and or decision-makers within the governance decision context and the persistence of existing unsustainable behaviours and practices can obscure those crucial societal issues such sustainability concern in the decision-making process and constrain the potential for disruptive innovation and transformative thinking toward desirable sustainability transition. Likewise, as Clark (2002: p. 3) succinctly notes, the traditional approach to planning and impact assessment, which may appear "good at solving certain kinds of problems", may

also tend to "simplify, misconstrue, or overlook" common societal issues of interest and struggles to become a successful result-oriented instrument within socio-political and biophysical contexts of the policy and development decision.

2.7 Stakeholder engagement

Stakeholder involvement is a critical element of the EIA process (Hartly and Wood, 2005; O'Faircheallaigh (2007) and articulated by Wood (2003: p. 275), "EIA is not without consultation and participation." Dooks (2019) and Freeman (2010) define stakeholders as individuals, groups, or organizations with vested interests in a project, capable of influencing or being influenced by associated activities. Scholars like Chanya et al. (2014) and Fritz et al. (2018) further classify stakeholders into direct (Primary) stakeholders actively involved in and impacted by a venture and indirect (Secondary) stakeholders who are not directly engaged but are keenly interested in the process and outcome of venture activities. In the petroleum sector, the direct stakeholders include developers, regulatory authorities, investors and financial institutions (Orsini 2016; Wild and Murphy 2016), and the indirect stakeholders comprise community members, ENGOs, academia, media and other interested bodies (Ahmed 2019; Wall 2012). The need for stakeholder consultation and participation in the oil and gas EIA process is highlighted as a due diligence environmental management exercise to ensure that the relevant stakeholders are engaged in the decision-making. According to Bawole (2013), the involvement of the secondary or indirect stakeholders, particularly the local people in the oil and gas EIAs, has the potential to facilitate the collection of traditional knowledge about the ecological settings where the developer will operate, including potential constraints and opportunities, addressing regulatory concerns from diverse perspectives, formulating effective mitigations measures, promote transparency social license for the developers to operate.

However, scholars such as Aung et al. (2019) and Yakubu (2018) argued that local communities' participation in the oil and gas EIAs has been somewhat rhetorical and cosmetics processes that focus on the process rather than the outcome of the project. In Nigeria's oil and gas industry, for instance, Ingelson and Nwapi (2014) reported that public participation is fundamentally flawed because what occurred over the years was

a retrospective public consultation. The authors further note that even where public participation tools took place, their impact indicates that they are essentially tokenism and lack a long-term positive impact on project design. This is because public participation usually occurs belatedly in the EIA process, which constrains the local inhabitants and relevant stakeholders from making input to the scoping of oil and gas a proposed oil and gas project development. Mwanyoka et al. (2019) found in Tanzania that public consultation and engagement are limited to regulatory authorities, and proponents and community members are disenfranchised and denied access to the oil and gas EIA process. As a result, other radical forms of participation such as violent demonstrations and recurring conflicts, have been adopted to confront the developers and officialdom (Ukeje, 2001; Isiaka, 2010; Koos and Pierskalla, 2016). The credibility and legitimacy of the oil and gas EIA process, including the outcome of project approval, is often determined by the scope and input of the stakeholder engagement and consultation.

2.8 Strategic Environmental Assessment

SEA was developed from the mainstream practice of project-level EA—dating back to the 1970s-80s when the legislative precedents for EA were established under the United States National Environmental Policy Act (NEPA). In the late 1980s, Wood and Djeddour presented an interim report to the European Commission in which they coined the term ‘strategic environmental assessment’ (Wood and Djeddour, 1989). From its formative stage in the 1980s to its current expansion from the early 2000s upwards, two international policy and legal developments have accelerated the widespread adoption of SEA. In particular, the SEA Directive (2001/42/EC) and the SEA Protocol to the UN Economic Commission for Europe (UNECE) Convention catalysed the establishment of the SEA transnational policy structure. Both instruments play a critical role in articulating a SEA procedure, drawing inspiration from the earlier European EIA Directive (1997/00/EC). The SEA Directive was enacted in June 2001 which requires the European Union (EU) member nations to evaluate the impact of a wide range of development plans and programmes (Dalal-Clayton and Sadler, 2005). The Directive became central to the initiative to improve and incorporate environmental components into decision-making. Subsequently, addressing the environmental effects of proposed policies, plans and

programmes became an important component of the World Bank policy which explicitly stressed that “environmental issues must be addressed as part of the overall economic policy rather than the project-by-project” (1987). This is a furtherance of the Brundtland Report (1987), published by the World Commission on Environment and Development and the Kyoto Convention on Climate Change (1997)—all of which reflect the ever-growing interest in addressing the environmental implications of PPP at the formulation level (Noble and Storey, 2001). SEA, however, has evolved in space and time as reported by Fischer (2007), Sadler (2001; 2002) and Dalal-Clayton and Sadler (2005), and in most jurisdictions, a proposed policy and plan initiative is required to go through the SEA procedure before development activities can begin, and it is now firmly adopted in the planning process of many countries in the World (Fundingsland and Hanusch, 2012).

2.8.1 SEA and oil and gas industry

SEA is promoted in the petroleum industry as a forward-looking and integrated assessment process or means to offset the limitations often associated with the traditional project-based EIA regulatory approach, which is largely limited to dealing with environmental issues solely by focusing on mitigating the likely effects of proposed oil and gas project development. It has therefore been noted that addressing the environmental impacts related to oil and gas exploration and production activities cannot be reduced to project-specific appraisal and decisions; instead, environmental and sustainability issues manifesting from such development could be linked to how policy, plan and programme are framed at the highest level of decision-making. A review of scholarship literature indicates that the choice of environmental assessment process to address environmental and sustainability challenges in the oil and gas sector has been progressively shifted from being perceived as project-based with limited focus on localised impacts to becoming increasingly evident that those fundamental problems must be addressed as part of overall policies, plans and programmes (PPPs) formulation (Harriman and Noble, 2008; Geißler et al., 2021).

SEA therefore can provide a means to enable decision-makers to proactively and thoroughly appraise the environmental liability of hydrocarbon PPPs development initiatives at the early stages of planning and decision-making when alternative futures and options for oil and gas development are still broadly open (Hasle et al., 2009; Caddell,

2016) and prior to ramping up an assessment of specific project development (Noble et al., 2013). By examining the proposed PPPs of oil and gas exploration and production activity, SEA can help provide the relevant actors with an opportunity for early integration of environmental considerations into key oil and gas development initiatives and ensure potential impacts are better addressed with consideration of a wide range of cumulative effects over a greater span of time and over a regional area, including alternatives and in doing so, to guide subsequent decisions and actions at projects level so as to be implemented in a broader sustainability framework (Doelle et al., 2012; Lamorgese and Geneletti, 2015). In principle, mainstreaming early environmental thinking can help improve regulatory governance in the petroleum sector to foster more environmentally sound PPPs to guide oil and gas planning and development. The ensuing sections briefly highlights the key potential benefits of mainstreaming SEA in oil and gas development assessment and decision-making.

2.8.1.1 Improved governance regulatory planning and decision-making

SEA can potentially help address policy-level and regulatory planning issues surrounding the issuance of hydrocarbon drilling permit licenses alongside a strong governance culture and institutional thinking to facilitate better environmental decision-making. Noble et al. (2013) indicate that an improved regulatory environment is core to SEA, and Doelle et al. (2012) argued that SEA can significantly help the decision-makers to proactively understand the risks of issuing exploratory licenses at a preliminary stage in the planning process as part of the government regulatory oversight to inform decisions and actions on where and when to open new frontiers to potential hydrocarbon exploratory activity. The process can significantly add value to the governance regulatory decision-making process by informing the prospective challenges and opportunities of the areas within which exploratory licensing ought in principle preclude hydrocarbon development for overreaching reasons of ecological or socio-economic sensitivity.

Of significance, as noted by Caddell (2016), is that the regulatory authorities can have the opportunity to articulate different scenarios, trends and uncertainties, including regulatory and political risks for pursuing certain proposed oil and gas PPP objectives, allowing strategic issues to be addressed from the perspectives of immediate and long-

term risks and benefits in order to facilitate promising pathways toward sustainable hydrocarbon development. These objectives are achieved through the collection and assessment of environmental baseline data and active engagement with the relevant stakeholders in the planning procedure and impact assessment to better understand the sensitivity of the hydrocarbon PPP development initiative on the ecological environment and, where necessary, identify data gaps in the oil and gas resources region at stake to provide clarity on the merits and demerits of issuance of oil and gas development permits, including setting the framework for future oil and gas resource development consent. This typically may involve addressing some critical questions of what is most likely to occur should licences be approved based on the current issues and trend of environmental conditions and preferences and what may likely be the most preferred strategic options to minimise the negative impact and risk of fostering certain proposed oil and gas PPP options while optimising net benefits or gains of such development to promote greater predictability and acceptability of the regulatory decisions among the key actors (Noble et al., 2013; Caddell, 2016). To this end, SEA can play a pivotal role in prioritizing environmental considerations within regulatory decision-making processes. It can also enhance institutional and governmental capacities to ensure environmentally responsible decisions and actions are taken prior to committing to hydrocarbon licensing and development.

2.8.1.2 Managing regional and cumulative effects

The undesirable impacts of oil and gas exploration and development can be cumulative and transcend sectoral and regional boundaries due to multi-oil and gas project schemes. Esterhuysen et al. (2018) state that the cumulative impacts of oil and gas exploration and development as consequences that result from incremental environmental changes induced by several project implementations that are typically not predicted within the footprint of a different individual project evaluation. In a practical sense, cumulative and synergistic effects of hydrocarbon drilling activities are somewhat interlinked with the interaction of other sectoral or subsidiary development activities, which often produce spatial risks and impacts greater than the sum of the individual effects. The flexibility-driven capacity of SEA allows it to be mainstream in a variety of contexts in the petroleum sector; it can be applied to assess the strategic drivers of cross-sectoral cumulative

effects or to broadly link the oil and gas proposal with the current and foreseeable activities of different sectors in the resource regions. For instance, it can support hydrocarbon regional resources planning and development, enabling a better understanding of the aggregates cumulative and regional implications of the oil and gas exploratory activities on the ability of ecosystems to adapt and respond to those incremental or residual environmental changes in the future, unlike the project-based EA that traditionally assessed the effects of specific oil and gas project development and managed such issues separately within a limited spatio-temporal location (Noble et al., 2013; Vilardo et al., 2020). This underlies the argument put forward by Doelle et al. (2012: p. 103) that SEAs can outline, integrate, refine and mitigate regional-scale concerns related to ecologically sensitive areas, multisectoral ocean use and cumulative effects in advance of project-based EAs.

Moreover, it can facilitate multiple sectoral-based EAs in or to establish a regional picture of the current and immediate environmental and social impacts of implementing a proposed oil and gas PPP development initiative while providing the basis for informed courses of decisions and action for future energy development, especially in the event that a substantial discovery in the new frontier basins is made. For example, Fidler and Noble (2012) reported that in the Atlantic Canada experience, the cross-sector cumulative effects assessment (CEA) is a statutory requirement that needs to be undertaken until the project EA tier. There has therefore been a growing recognition that the overall intent of SEA of oil and gas can promote the exploration of feasible and reasonable alternative or strategic options for hydrocarbon drilling activities which involve an array of multiple individual projects of different characteristics and evaluation of those alternatives scenarios based on their wide-ranging potential risks and opportunities to regional context, all of which can be instrumental in the establishing most environmentally-friendly option to formulate short—medium-long-term measures to address and manage uncertainties and residual environmental and social impacts as they unfold, including guidelines for implementation and monitoring to achieve desired outcomes (Elvin and Fraser, 2012; Fidler and Noble, 2012; Esterhuyse et al., 2018).

2.8.1.3 Strengthen project-based EIA

Mainstreaming SEA into oil and gas PPP-making is noted as a means by which a more efficient and meaningful project-level assessment can be achieved (Fidler and Noble, 2013). In principle, it is envisaged that as each level of proposed hydrocarbon policies and plans moves downward through the different tiers of decision-making, the nature and scope of decision-making will likely change along with the overall prime objectives of environmental assessment. From a practical perspective, as argued by Geißler et al. (2021), SEA can help influence these multi-faceted levels of oil and gas planning and decision-making and provide a clearly defined strategic orientation to more specific projects and streamline plan-making and impact-related appraisal to improve decisions and actions at each planning stage. It can provide a consistent and coherent framework for regulatory authorities and developers to focus on addressing common important issues at the project assessment and implementation tier. In particular, the SEA of oil and gas is of central importance in scoping comprehensive guidance and greater predictability on impact mitigation measures to shape the trend analysis at the lower levels of project decision exercise.

Also, it can enable the regulatory actors to better understand spatial implications of oil and gas project development, where hydrocarbon activity can occur and what environmental and sustainability conditions must be placed on project-level assessment to address inconsistencies between PPPs and site-specific projects (Geißler et al., 2021). Doelle et al. (2012) add that SEA can potentially play a key role in ensuring policy commitments of hydrocarbon drilling and assessments are taken at the right time, typically reflecting more strategic thinking rather than belatedly reacting to an individual project proposal. They state that SEA can allow complex petroleum infrastructure projects that need to go through several planning tiers—to systematically proceed in a phased manner without the detailed site-specific bundle of data while funding and regulatory approvals are sought to save time and resources.

2.8.1.4 Added clarity and greater certainty for developers

By their distinctive nature, strategic hydrocarbon PPPs development initiatives exhibit wide-ranging and less predictable outcomes than project-driven assessment and

implementation processes. It is therefore argued that the process of planning for and assessing the impact of an oil and gas strategic proposal will be naturally characterised by a high level of uncertainty and it is highly unlikely to be undertaken as rigorously and quantitatively as the equivalent stage of project-level appraisal activity (Geißler et al., 2021). Regulatory authorities may have different reasons and or conditions that shape their formulation of certain strategic decisions or options, albeit these reasons should be linked to the promotion of greater clarity and certainty in the oil and gas decision-making, that is, the need to address the core issues of ‘why’ and ‘what’ questions at least, at the strategic level and not at the level of individual oil and gas drilling operations to foster a shared sense and a common acceptance of project-level operational outcomes (Noble et al., 2013). This will ensure that the outcome of policy and decision-making reflects a consensus between the developers and regulatory authorities and can help draw up short- and long-term visions in preparing oil and gas PPP development initiatives. Part of the clarity will provide an opportunity for developers to focus on the more spatially-specific crucial questions about project-level decisions in terms of ‘where’ and ‘how’ during the oil and gas EIAs and a better understanding of whether a certain project is deemed acceptable by the social threshold, including obstacles and challenges in terms of data availability, consultation and coordination of interests. There is, accordingly, a scope through SEA upon which the developers obtain a social license to undertake hydrocarbon drilling endeavours in particular jurisdictions or areas, thus helping manage risk and minimize conflict when individual projects are proposed.

Overall, SEA of oil and gas can potentially play an important role in reducing the potency of uncertainty that underlies the PPP-making and mitigate the erosion of social trust between the developers and regulatory authorities, which is often considered a recipe for the inefficiency in managing risk and impacts associated with the development of oil and gas in order to optimise the environmental performance.

2.8.1.5 Improved coordination of local engagement in decision-making

It is claimed that the SEA of oil and gas can, for example, play a central role in ensuring these issues are addressed through early consultation with the affected local communities about the proposed oil and gas PPPs development initiatives, enabling

them to better understand the desirable and undesirable outcomes of fostering certain oil and gas drilling activities in their regions. This is largely because the environmental consequences of oil and gas development are transboundary in nature, requiring the collaboration and engagement of the key regulatory actors and the relevant stakeholders. Yet, in many jurisdictions, as observed by the World Bank (2011) and OECD (2012), engagement and consultation with the local inhabitants who are mostly affected by environmental degradation due to their dependence on environmental resources for livelihood often occur too late in planning and decision-making.

Noble et al. (2013) reported that early engagement and direct communication through SEA could facilitate a window of opportunity for regulatory authorities and developers to demonstrate how potential oil and gas exploration and production can contribute positive net benefits to the local communities while at the same time taking into account their views and perspectives in the formulation of appropriate measures to mitigate environmental, social and economic impacts before the selection of a particular PPPs, rather than mainly triggering consultation on how the impacts of an individual project would be prevented or mitigated. The rationale is that consultation with relevant stakeholders can increase the transparency of the policies and plan preparation process, and the local communities are likely to accept the identified impact, risk and potential opportunities of proposed oil and gas development once the regulatory authorities and developers have enlightened them about the nature and scope of hydrocarbon development in their region and their environmental preference and values are taken into the decision-making process. This view corroborates an investigation by Fidler and Noble (2012) that explored SEA practice and its influence on oil and gas planning and decision-making in three international offshore systems; Atlantic Canada, the United Kingdom and Norway. They found that early engagement and consultation through the SEA ensure procedural integrity and provide an opportunity to identify critical and pertinent issues of concern to the local inhabitants, particularly at the scoping stage, enabling decision-makers to select the best and most reasonable possible strategic option for achieving sustainable oil and gas development objectives.

Furthermore, SEA of oil and gas has a practical significance primarily in prioritising the aspirations and expectations of the local populations in planning and decision-making for oil and gas development, ensuring equitable and fair distribution of impacts, benefits, risks and uncertainties, including compensation for the marginalised and vulnerable population negatively affected by a distributional environmental and social stressor (Esterhuyse, 2018; World Bank, 2011). This is noticeable in the Norwegian multi-sectoral SEA experience that demands not only transparent and participative procedures but also a comprehensive understanding of the distributional environmental impacts or risks while ensuring that the social benefits of hydrocarbon development to the local population to ensure environmental justice and achievement of sustainable development (Doelle, 2012). Overall, the purpose and focus of SEAs are to ensure adequate stakeholder input in the scoping and decision-making to effectively mitigate the potency of potential conflicts and disruption in the implementation and management of hydrocarbon resource extraction and the risk of future resistance and litigation of the further exploration of oil and gas frontier basins. As succinctly captured by Doelle (2012), the implementation of SEAs in the petroleum industry is only as valuable as they effectively engage the relevant stakeholders and interested parties with stakes in the outcome of the proposed oil and gas strategic development initiatives to achieve the goal of planning and assessment process.

2.8.1.6 Mainstream sustainability in the oil and gas PPP-making

It is argued that SEA is a means of achieving sustainability outcomes in the oil and gas industry. For example, scholars such as Lamorgese et al. (2015) and Doelle et al. (2012) suggest that SEA of oil and gas is linked to sustainability in the sense that it offers a precautionary management principle for ensuring the natural capital and prevention of environmental damage, particularly unacceptable and irreversible changes are guaranteed in the decision-making. They stated that the SEA can help regulatory authorities integrate environmental considerations in the formulation of oil and gas policies, plans, and programmes along with social and economic components in an accountable, transparent, and efficient manner. For example, it can serve as an integrated planning and impact assessment system in the oil and gas sector through which sustainability objectives and criteria can be mainstreamed in decision-making. This

typically may involve the identification of long-term strategic objectives and the most critical development targets to develop an assessment framework that centres on a few yet intertwined factors—the Critical Decision Factors (CDF) against which the sustainability of PPPs can be assessed in the oil and gas industry. The critical decision factor enables the use of indicators which are more specific and sound integrated themes that should be addressed in the strategic planning and assessment to ensure targeted and goal-oriented strategies or measures to achieve environmental practicality and sustainability objectives rather than focus on a broad range of elements that primarily assess the present state of the environment or model past and current stressors to formulate remedial response measures.

A range of strategic direction or options is often considered through dialogue-led representation, consultation and engagement with the relevant stakeholders, enabling decision-makers to focus on those aspects that can serve as critical indicators of socio-ecological change—Valued Ecosystem Components (VECs), land-use changes and livelihood sufficiency in the guidelines for the implementation of oil and gas PPP development initiatives (Lamorgese et al., 2015) and the need for continued monitoring. Therefore, the underlying purpose of SEA links to sustainability in the oil and gas sector is related to the exploration of a range of alternative futures of hydrocarbon policies and plans and judging the impacts, risks and opportunities based on environmental criteria and targets and the selection the best strategic options or preferred courses to promote environmental sustainability practices in the oil and gas practice. Framing an image of an array of impacts on the ecosystem arising from a vision of oil and gas policies and plans development initiatives can help in predetermining acceptable sustainability principles in the decision-making to improve socio-ecological composition during hydrocarbon exploration by managing and minimizing full-scale potential cumulative and transboundary issues (Elvin and Fraser, 2012; Horvath et al., 2004; Esterhuyse et al., 2016).

2.8.1.7 Promote system-wide knowledge and learning

Generation of system-wide knowledge and learning has been identified as one of the key potential benefits of SEA implementation in the oil and gas industry. SEA can facilitate a foundational platform for transformative learning during oil and gas planning by

fostering engagement and consultation among regulatory actors, developers and interest groups. This learning process occurs across multidimensional stages, stemming from scoping and continuing during plan preparation, aiming to identify critical issues that need to be addressed by SEA. These issues may include jurisdictional claims related to aboriginal land as well as the integrity of ecological and marine environments, which could be severely affected by hydrocarbon drilling activities and associated infrastructure development. This will strengthen the role of transferring knowledge and information among the critical relevant participants, particularly the local inhabitants who have first-hand experience of the socio-economic and marine environment at stake (Fidler and Noble, 2012).

2.9 Examining SEA practices in the oil and gas sector

Various forms of SEA practice are increasingly advancing internationally in the oil and gas sector with diverse provisions, scope and modes of application across different jurisdictions and countries (Fidler and Noble, 2012; Doelle et al., 2013). In Europe, energy plans and programmes are explicitly listed in Article 3 sub-section 2 (b) of the SEA Directive, making it mandatory for all European Union member states to establish a framework for assessing the impact of oil and gas plans and programmes on the environment (European Commission, 2001; United Nations Economic Commission for Europe, 2000).

In the United Kingdom, oil and gas plans and programmes are subject to SEA requirements before the appropriate national regulatory bodies grant an operative licence permit to open new frontier basins for hydrocarbon drilling activities (Fidler and Noble, 2012; Caddell, 2016). In particular, Article 1 of the SEA Directive in the UK aims to "provide for a high level of protection of the environment and contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes..." including hydrocarbon plans and programmes. The SEA system was formalised into law through the Directive in 2004, as indicated by the Office of the Deputy Prime Minister' ODPM', 2005. However, it is worth noting that as early as 1999, before the adoption of the EU Directive (2001/42/EC), the defunct Department of Trade and Industry (DTI), particularly in anticipation of the EU SEA Directive had already taken

steps further to carried out some form of SEA-like processes as part of the offshore licensing process to inform decisions related to which frontier basins should be granted 'Development and Production Consent' to extract oil and gas natural resources (DIT, 2001, 2003; ODPM, 2005). The SEA in the UK was also transposed into a planning and decision-making framework across the devolved system of territorial administration of England, Scotland, Northern Ireland and Wales, enabling SEA to operate with considerable flexibility related to the guidance framework, the scope of application and quality of practice.

Given the explicit thrust of guidance, the SEA system in the country reflects a procedural model for best practices due to its emphasis on early application, scoping, examination of cumulative effects, consideration of alternatives, appraising the impact of the draft plan, public participation, monitoring and implementation of the plan among others (UK Oil and Gas Authority, 2019). For example, the Directive requires broad-based participation—emphasising consultation and communication with inter-alia, environmental regulatory authorities and other relevant stakeholders or interested groups. Public participation and consultation meetings are open to all interested stakeholders during screening and scoping, and notifications of the outcome of deliberations are disseminated to the public through a diverse medium when an SEA report is eventually published.

Furthermore, the UK guidance has established key policy commitments—describing SEA as an 'integral part of achieving sustainable development', which means that the process should not only broaden the scope of evaluation but also set sustainability objectives and analyse whether the proposed PPP initiatives are achieved (ODPM, 2004b; UK Government, 2005; Cabinet Office, 2005). However, despite the perceived practical significance of SEA in the UK, the current practice and experience exhibit some fragilities. For example, Caddell (2016) observed that the decision-making processes centred on granting licenses and permits for oil and gas drilling activities are typically constrained by limited information about the offshore ecosystem, the potential impacts of specific pollution sources, and the cumulative effects of hydrocarbon developments. Thus, granting development and production consent in the face of significant uncertainty

surrounding the likely threats to the marine environment often undermined the decision-maker's capacity to effectively design and implement appropriate mitigation measures and make informed decisions that prioritise environmental sustainability.

Moreover, some compelling evidence highlights other aspects that are deemed problematic about the effectiveness of SEA in the country, such as the limited scope of SEA's influence, which is predominantly confined to high-level planning and decision-making processes, resulting in minimal tangible benefits at the operational level of programmes decisions and actions (Fidler and Noble, 2012). In order to realise the full benefits of the trickle-down approach, additional requirements for EIA-derived procedure are still conducted at the project level to evaluate the likely impacts of each proposed oil and gas activity to complement the SEA process overseen (Doelle et al., 2012).

In Canada, the environmental assessment (EA) for certain types of PPP initiatives is generally governed by federal legislation, although each province and territory has established its own EA framework. At the federal level, SEA was formally institutionalised in the early 1990s through the Cabinet Directive, distinct from the conventional project-level EIA 'making it one of the new generations of SEA that evolved in the 1990s' (Dalal-Clayton and Sadler, 2005, p. 61). The Canadian Cabinet Directive on Environmental Assessment of Policy, Plan and Programme Proposals stipulates the guiding principles for SEA implementation, which states that the process should be conducted proactively and timely, ideally in the early stages of the PPPs formation to support sound and long-term planning and decision-making (Rivard et al., 2014; Environment Canada 2004; CEAA, 2000, CCME 2009). By adhering to these principles, the oil and gas plans, programmes and policies are subject to SEA screening or comprehensive evaluation under the collaborative federal-provincial decision-making framework through the two offshore boards: Canada-Newfoundland Offshore Petroleum Board (C-NOPB) and Canada–Nova Scotia Offshore Petroleum Board (C-NSOPB). The aim is to allow decision-makers to establish environmental baseline conditions to make decisions about where, how, and when to explore potential oil and gas reserve frontiers before the issuance of permit rights for exploration. At the same time, the proponents often draw upon the eventual outcome of environmental baseline conditions used by the C-NSOPB and C-NOPB at the

strategic decision-making level to reinforce their subsequent baseline assessment of specific oil and gas projects. Several SEAs and SEA-like approaches were undertaken at sectoral and regional levels for Canada's oil and gas planning and development. These include the Sable Island Bank region, the Orphan Basin frontier, the Laurentian Sub-basin area, and the Anticosti, Madeleine and Baie des Chaleurs Basins (Government of Canada 1990a; CNSOPB, 2003; Lamorgese et al., 2015; Elvin and Frazer, 2013).

Elvin and Frazer (2013) underscored the role of SEAs and SEA-like in assessing the cumulative effects of hydrocarbon drilling activities on marine ecosystems, commercial fisheries and marine traffic. However, the SEAs practice in Canada is not without some weaknesses. SEA applied in certain regions does not fully realise the strategic aspects which are the core intent of a SEA. This is partly due to the variation in the guidance and application across the country's federal and provincial administrative regions. For example, no formal SEA regulations exist for the oil and gas sector in the Canadian Northern province and offshore Arctic regions. In particular, hydrocarbon exploration and/or drilling activities in the Beaufort Sea region are still largely planned and evaluated based on traditional project-based impact assessments. Moreover, unlike the UK SEA system, the Canadian SEA framework established by the Cabinet Directive lacks obligatory public consultation or engagement provisions. Doelle et al. (2012) observed a noticeable dearth of public participation in SEAs undertaken by the C-NSOPB. The same author further underscores that while pertinent stakeholders and the broader interested public are encouraged to offer their insights on the scoping and final SEA document, there is a lack of proactive measures to foster their active involvement in the process.

In Norway, several SEA-like processes are practised for oil and gas planning and development, comprising regional EAs (REAs), a site-specific EA, and an Integrated Management Plan (IMP) approach. The multi-sectoral approach is intended to follow principles of integrated planning and assessment through democratic and stakeholder engagement to inform early decision-making related to oil and gas policies, plans, or programmes. Norway's IMP broadly aimed to facilitate the effective assessment of the cumulative impacts of oil and gas development on different sectoral areas to better understand the potential downstream effects of other development actions beyond the

hydrocarbon drilling activities, enabling focus on limitations and opportunities for the coexistence of energy development, marine species and shipping activities and the capacity of the ecosystems to adapt and respond to socio-ecological change. Fidler and Noble (2012) stress that the multiple sector-based EAs allow decision-makers to design a regional scenario of the existing environmental and social stressors and to inform management plans and courses of action for future oil and gas development. The Norwegian IMP does not explicitly mandate alternative scenarios, although the scope of its environmental monitoring programs includes a minimum action threshold that informs strategic planning for future scenarios. Tiering and co-ordination were identified as the main intents and benefits of Norway's multi-sectoral SEA approach, where decisions and actions at the strategic level appear to have a considerable degree of bearing on the project level. In this context, the proponents are expected to perform detailed assessments to help guide project activities and prevent the negative impacts of oil and gas development, which the Ministry of Petroleum and Energy oversees.

Norway's IMP promotes early consultation and engagement to help inform the public about the potential impact of oil and gas development on the marine environment. This has resulted in improved scoping practice and facilitated learning due to the exchange of information and knowledge among the relevant actors. Therefore, as evidenced by its incorporation of alternative and future scenario-based assessment, Norway seems to have implemented the broadest scope of environmental assessment procedures in oil and gas planning and development (Olsen et al., 2016; Noble et al., 2013; Doelle et al., 2012; Lamorgese et al., 2015; Fidler and Noble, 2012).

In the Gulf of Mexico, SEA is practised at a regional level in accordance with the National Environmental Policy Act (EPA 2004). The main intent of the SEA in the US is to provide general policy guidance or direction for the planning and development of natural gas, oil and other mineral resources on the outer continental shelf (OCS). This involves conducting a comprehensive evaluation of potential environmental impacts and identifying suitable alternatives to oil and gas development to ensure that the transformation of spatial hydrocarbon drilling activities does not undermine the ecologically and biologically significant areas (EBSAs) that are of interest to the people

(UNECE 2000b; CEQ, 1978; Fischer and González, 2021). However, the guidance and application of SEA in the US are still deeply rooted in the plans and programmes of EA, which require the preparation of Programmatic Environmental Impact Statements (PEISs) overseen by the country's Bureau of Ocean Energy Management, Regulations and Enforcement (BOEMRE) (Benjamin, 2014; Webb and Sigal, 1992; www.epa.gov). For instance, it is typical for the preparation of PEISs to entail the conglomeration of projects that exhibit technical or geographical commonalities, ultimately resulting in a site-specific analysis. Approximately one-third of the states operating under the purview of the Federal Government have established their own distinct EIA regulations, yet only a limited number of these regulations encompass PPPs.

Some key barriers to effective implementation and practice in the US include the fragmented approach to SEA, diffusion in the decision-making processes which is often compounded by the lack of co-ordination among and between various agencies, and a process which is fundamentally geared towards the production of a technical report rather than influencing the different tiers of PPP-making (World Bank, 2002; www.epa.gov).

In Australia, SEA came into existence in 2010, and its maiden strategic action plan was completed under the aegis of the Federal government's Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). As a current practice, SEA is operationalised voluntarily as a strategic assessment (SA) when a proponent initiates or submits a policy, plan or program proposal (Pope et al., 2018). More often, the proponents are incentivised to undertake a strategic assessment with the assurance that once a strategic plan is endorsed, the subsequent or future projects falling within the scope of the same plan will require only a simplified environmental impact assessment under the EPBC Act (Pope et al., 2018). Specific to the petroleum industry, a strategic evaluation of the Browse Basin liquefied natural gas precinct and offshore development in Commonwealth waters was performed in the country. The guidelines for the SEA system in Australia explicitly promote "ecologically sustainable development outcomes" (EPBC, 2013), and for a formal SEA to be approved by the Minister shall fulfil the endorsement criteria outlined in the extant regulations, namely environmental, social

and economic elements and terms of reference are agreed upon between the proponent/developer and the regulatory authorities. The SEA in the country reflects 'best practice' due to its greater emphasis on sustainability, which is centred on ensuring that the risks and benefits of oil and gas development are adequately assessed in the PPP-making process. In practice, however, it has been noted that the Australian SEA system displays some limitations by not adequately fulfilling these principles, and the consideration for alternatives appears to be concentrated on plans aspects rather than strategic policy alternatives (O'Faircheallaigh, 2015; Marsden, 2016; Lamorgese et al., 2015; EPBC, 2013).

In Denmark, SEA-like processes were established in 1993 by an administrative Circular from the Prime Minister's Office. In 2006, the Danish Ministry of Environment and Energy developed up-to-date Strategic Environmental Impact Assessment (SEIA) guidance, which is intended to represent a broadly effective platform to guide hydrocarbon development licensing decisions. The general principles of the Danish SEIA include inter-alia scoping (including consultation), alternatives, environmental mitigation measures, summary and explanation, and monitoring of environmental effects. Proponents of oil and gas concessions or development are expected to comply with general restriction areas or a certain degree of mitigation measures and monitoring requirements identified in an SEIA report, which is used as part of the basis for decisions by relevant authorities (NERI, 2007; Wulff, 1998; Bortmann et al., 2009; DETR, 1998a; Danish Ministry of the Environment and Energy, 2008; Lamorgese et al., 2015). The SEIA also aim to highlight knowledge and data gaps, identify issues of interest to stakeholders, and facilitate recommendations for oil and gas planning and mitigation.

However, the current application of Danish SEIA has been characterised by the dominance of statutory environmental consultees, lack of satisfactory scoping and coupled with the somewhat laissez-faire approach to monitoring the development of SEA at the policy level and its contributions to plans and programmes implementation to identify how in a practical sense both spectrum of decision-making complement and stimulate each other (Chaker, 2006). In the Republic of Cyprus, SEA was transposed through the Assessments of the Effects on the Environment of Certain Plans and/or

Programmes Law 140 (I) of 2005. The SEA regulations aim to describe the scope of the environmental impacts likely to stem from the hydrocarbon activities to ensure environmental protection and sustainable development within the Exclusive Economic Zone (EEZ). In order to effectively engage in hydrocarbon exploration and/or exploitation, the licensee is required which is expected to strictly adhere to the guidelines and outcomes stipulated by the SEA, along with the recommendations proffered by the Environmental Authority, which falls under the purview of both Ministry of Environment and Natural Resources and Agriculture (Lamorgese et al., 2015).

Likewise, detailed and specific EIAs are expected to be prepared for individual oil and gas project development. The SEA procedures in Cyprus appear to reasonably reflect the elements of good practice due to their due diligence in considering cumulative impacts and alternative hydrocarbon development possibilities in planning and decision-making. This may be considered, however, to be among the strong features of procedural aspects of current Cypriot SEA practices (UNEP, 2014). Notwithstanding, monitoring and alternatives are recognised as salient factors that warrant due consideration, albeit they are commonly accorded less prominence under the SEA guidelines in the country.

2.10 Barriers to SEA integration in developing countries

Although the preceding sections reviewed the international practice of SEA in the oil and gas sector within the developed countries. This section examined the perceived barriers associated with SEA integration in the oil-rich countries in Africa. Table 2.1 below presents the main challenges and constraints to SEA implementation found in the literature.

Table 2.1: Challenges to SEA integration in oil-rich African countries

i.	Perception of the SEA approach and its added-value
ii.	Insufficient political will for SEA integration
iii.	Dominant EIA system
iv.	Institutional capacity and coordination

2.10.1 Perception of SEA approach and its added-value

The key challenge to advancing a strategic approach to planning and impact assessment in several oil-rich African countries is that a basic understanding or knowledge of what SEA is and what it should deliver in the context of oil and gas planning and development has not yet been understood. This general lack of basic understanding of the differential between the importance of assessing the impact of proposed policy, plan and programme development initiatives in the oil and gas industry before ramping up the assessment of project effects among the relevant stakeholders within the petroleum industry has been the major constraint to SEA implementation. Essentially, the perception of SEA among the regional stakeholders is perceived as a key barrier to implementing the strategic approach to planning and impact assessment in the oil and gas industry (Slunge and Loayza, 2012).

2.10.2 Predominant of EIA system and practice

Another key barrier to SEA integration is the predominant EIA practice within the well-established and resilient regime in the petroleum industry. With such a project decision culture in mind, transitioning from the normative approach of the project-driven EA to introducing an SEA as a distinct process or complementary exercise in PPP development often changes the existing doctrine of decision-making systems or modifies a long-standing practice. Fischer (2005: 409) notes that “there are indications that if the motive of SEA contradicts values of decision-makers, stakeholders and other actors, effective implementation will be challenging, if not impossible, despite its potential added-value in the PPP-making. Transitioning from the traditional project-based approach to EA to a more strategic form of planning and decision-making often faces resistance from the incumbent actors. The resistance is rooted in the assumptions that SEA will challenge the well-entrenched path-dependent trajectories and preferences of the institutional culture and undermine the arbitrary authority of the independent actors. Thus, greater difficulties of SEA integration are likely to be more prominent, particularly where the environmental governance culture is closely linked and dependent on the long-standing EIA practice. Fischer (2005) argues that the consistent and effective implementation of SEA is likely to be hampered by altering the normative perspective of the traditional EIA system and fostering a broad-based commitment of the necessary actors and

stakeholders to embrace it. This challenge is often common in countries that are more closed and rigid to accountability and transparency as an important component of environmental planning and decision-making (Partidario, 1996; World Bank, 2010). Hence, EIA's normative and cognitive dominance in the decision-making landscape induces difficulties that may hinder SEA's implementation in the environmental governance setting.

2.10.3 Institutional capacity and coordination

Integrating a strategic approach to the oil and gas policy sector depends on institutional cooperation and coordination across and within the institutions. In many African countries, separate departments and even units within the environmental departments are poorly coordinated and characterised by divergent value systems, bureaucratic prerogatives and power relations (World Bank, 2010). For instance, Slunge and Loayza (2012) observed that power constellation and unhealthy interactions often persist between decision-makers or regulatory actors and the relevant stakeholders stemming from the contradictions between prevailing environmental legislation and practices, political ideologies and competing objectives. Within this context, a strategic approach cannot be effectively implemented if there is no consensus on the willingness to co-ordinate and co-operate along the underlying values and interests within an organisational and institutional actor. This is because the adoption of SEA is highly dependent on the willingness of the planners within the environmental institutions or agency and professionals involved in the impact assessment process and the extent to which they collaboratively embrace the instrument.

2.10.4 Insufficient political will for SEA integration

The current environmental assessment policy regime in several African oil-rich countries is predominantly based on project-project assessment. However, there is a lack of political capital to initiate a transition toward a more strategic regime to plan where and when to open new areas to potential oil and gas drilling and exploration activities. Securing strong political support to mainstream strategic approach into a high level of PPP formulation faced considerable resistance due to a lack of awareness of the need for SEA and the added value that may result from its eventual application among non-

SEA experts, particularly the politicians who are saddled with the responsibility for making decisions at the national or regional governments levels (Slunge and Loayza, 2012). Moreover, there is a concern that introducing environmental assessment for higher-level strategies will increase the timeframe for decision-making or delay hydrocarbon development, add significant cost and increase workload (World Bank, 2010; 2019). This perception poses a considerable challenge to incorporating SEA into the oil and gas policy-planning and decision-making process, hindering the potential benefits it could bring to sustainable development.

2.11 Chapter Summary

This chapter comprehensively reviews the relevant literature on environmental assessment and the oil and gas industry. The discussion underscored the global economic significance of oil and gas production while explaining the interplay of power, politics and elite interest in the petroleum sector. To this end, the chapter describes the oil and gas governance structure alongside the role of key actors like the government, national oil companies, international oil companies, investors, and non-state actors. A detailed examination of the environmental impacts associated with oil and gas development was presented. Additionally, the chapter elucidated the role of EIA in the industry, addressing governance issues and the crucial aspect of stakeholder engagement in decision-making processes. The discourse extended to the role of SEA in the oil and gas sectors, exploring both its potential and realised contributions in planning and development. Moreover, the chapter provided insights into international SEA practices in developed countries, offering a comparative perspective. It concluded by providing an overview of the potential barriers to the integration of a strategic approach to planning and impact assessment in the oil and gas policy sector in developing countries. This comprehensive literature review serves as a foundational framework for the subsequent empirical exploration and analysis undertaken in the study.

CHAPTER THREE

Context and Background: EIA System in Nigerian Oil and Gas Sector

3.1 Introduction

This chapter provides an in-depth analysis of the Nigerian national context and the development of the EIA system within the oil and gas sector. It begins with a historical overview of fossil fuel development in the old frontier of the Niger Delta region. The analysis encompasses the environmental and socio-economic impacts of oil and gas exploration and development in this region while also considering the potential for hydrocarbon extraction in emerging frontiers that are gaining increased interest. Furthermore, the chapter elucidates the relevance of the EIA and its procedural framework in informing management decisions related to oil and gas operations. Subsequently, it delves into the role of the EIA in the decision-making processes pertaining to oil and gas in Nigeria, offering a comprehensive overview of the EIA system and its specific application to oil and gas decision-making. The concluding section identifies the principal stakeholders engaged in the oil and gas EIA framework and analyzes the power dynamics that exist among these various actors.

3.2 Historical development of oil and gas in Nigeria

The history of oil exploration in Nigeria dates back to 1903, when the German-owned Corporation Nigerian Bitumen Company began exploratory activities in the village of Araromi, in the western region of Nigeria (Yusus and Omoteso, 2016). However, the company's ground-breaking effort for oil prospecting in Nigeria was abruptly truncated by the First World War in 1914. Following the war, the multi-national oil corporations were again brought in to resume exploration in Owerri, now Imo State. In 1937, a new mining license was given to Shell D'Arcy, which later became Royal Dutch Petroleum Company to undertake hydrocarbon exploratory activities. The hostilities preceding World War II again interrupted the Shell D'Arcy foray into the oil prospecting adventure. However, in 1946, a consortium of Shell and BP (then known as Anglo-Iranian) was granted a monopolistic license under the Mineral Oil Ordinance of 1914, promulgated by the British colonial administration in Nigeria. This legislation bestowed Shell-BP with an exclusive

concessionary right, covering 920,000 square kilometres to explore potential hydrocarbon deposits in Nigeria (Kadafa, 2012).

After over half a century of tenacious efforts by Shell-BP in the quest for oil discovery in Nigeria's Niger Delta regions, several oilfields were discovered in 1951. The first commercially viable quantity of crude oil was reportedly found in 1956 at Oloibiri in Ogbia Local Government Area in present-day Bayelsa State. By the late 1960s and early 1970s, Nigeria had emerged as a significant oil producer, with major fields like Afam, Bomu, and Ebubu in the Ogoni territory contributing to a daily production threshold of 2 million barrels. Concurrently, natural gas resources were discovered in the Southeast part of Warri in Port Harcourt, propelling Nigeria into the era of the petroleum regime and leading to its membership in the Organization of Petroleum Exporting Countries (OPEC) in 1971 as net producers of oil and gas products (Steyn, 2009).

However, in response to widespread discontent over the exclusive monopolistic control of the British Royal Dutch Petroleum Company, the 1958 mineral oil ordinance was enacted, effectively nullifying the 1914 oil ordinance (Raji and Abejide, 2014). This legislative shift ushered in the democratization of the oil and gas regime, allowing several multinational oil companies to participate in the Nigerian oil and gas industry. By 1955, Mobil Company, a part of the Mobil Oil Company (later Mobil Producing Nigeria), became the first to secure an oil prospecting license, marking its entry into the exploration landscape. Subsequently, other major multinational entities joined the exploration landscape, including Tennessee in 1961, Chevron in 1961, Elf in 1962, Agip in 1962, Gulf in 1964, and Esso in 1965. Collectively known as the "big six," these foreign firms established dominance in Nigeria's oil and gas exploration, production and operations landscape (Ite et al., 2013). This development, fostering healthy competition among these multinational oil entities, ensured that the country did not overly rely on a single dominant player. The Nigerian government entered into international agreements with these multinational oil companies through joint venture pacts. This commitment, integral to the petroleum industry's contracts, entailed shared management and financing of exploration and production activities. Joint venture agreements became the primary mechanism for investment and exploration, involving the Nigerian National Petroleum Company in 1977,

a state-owned and controlled company playing a significant role in upstream and downstream sectors. These agreements marked a critical collaboration between the NNPC and multinational oil companies in Nigeria (Ite et al., 2013).

Oil and gas resource extraction occurs both onshore and offshore across nine administrative components, including Abia, Akwa Ibom, Edo, Ondo, Imo, Rivers and Cross River—constituting the oil-rich Niger Delta region (Figure 3.1). This region, central to oil and gas exploration activities for over half a century, holds special recognition and national prominence in the discourse on national resources within the Nigerian Federation. The country's development has been intricately linked to the oil and gas industry, which is critical in shaping and sustaining the economy. Nigeria has shifted its focus from the agricultural sector, which was hitherto the main revenue source. Oil and gas exports contribute over 98% of export earnings, approximately 83% of federal government revenue, and more than 35% of its gross domestic product (GDP) (World Bank, 2015). Additionally, the sector provides 95% of foreign exchange earnings and about 65% of government budgetary revenues (Tukur Umar and Hajj Othman, 2017).

In terms of political structure, Nigeria operates a three-tier governance system with 36 states and 774 Local Government Councils Areas. Abuja serves as the central administrative seat of power. Structured around six major political zones—North-East, North-West, North Central, South-South, South-West, and South-East—Nigeria operates a powerful centre with significantly weak sub-constituent states. These states have limited capacity to generate internal revenue for substantial socio-economic development, with the exception of the state of Lagos.

Figure 3.1 Map of Africa showing Nigeria and the old frontier of oil and gas in the Niger Delta region



Source: Adapted from Ebhuoma et al. (2020)

The old frontier of Nigeria's oil and gas development in the Niger Delta region occupies a vast area spanning 70,000 square kilometres, which is characterised by wetlands predominantly formed through sediment accumulation. The old frontier region constitutes approximately 7.5% of Nigeria's entire land area of 923,768 sq. km. Notably, it represents the largest wetland and the third-largest drainage basin on the African continent. The ecological landscape in the Niger Delta area can be categorised into four distinctive zones: coastal barrier islands, freshwater swamps, mangrove swamp forests and low-lying rainforests (Anifowose, 2008; Chinweze et al., 2012; Osuji et al., 2004; Nwilo and Badejo, 2005). It is home to over 20 million inhabitants divided into 40 distinct ethnic groups. Most residents in the region solely rely on fishing and farming as their primary means of livelihood.

The region hosts 606 oil fields, with 360 located onshore and 246 offshore. Additionally, there are 275 flow stations, and an extensive network of over 7,000 kilometres of pipelines crisscrosses more than 800 communities in the old frontiers of oil and gas production. Oil and gas exploration and production is often perceived as a double-edged sword. While it facilitates economic and social development in Nigeria, it simultaneously

leads to significant environmental degradation in the Niger Delta area. The following section provides a succinct overview of the ecological challenges intricately linked to Nigeria's oil and gas industry.

3.3 The environmental impacts of oil and gas exploration in the old frontier region

The exploration and production of crude oil in the old frontier region has had far-reaching adverse effects on the environment. Several activities in crude oil and natural gas processing, ranging from extraction, refining, and transportation, lead to oil spills in the region. Scholars such as (Ojewumi et al., 2018; Kadafa, 2012) reported that the Niger Delta region has experienced an estimated 13 million tonnes of crude oil spilt over the past five decades. In 2020 and 2021, Nigeria's National Oil Spill Detection and Response Agency (NOSDRA) recorded 822 combined oil spills, totalling 28,003 barrels of oil permeated into the environment. Oil spills are seen as the unlawful release of liquid petroleum hydrocarbons into the environment due to pipeline vandalism, sabotage and tanker accidents (Useh et al., 2017; Zabbey, 2004). The long history of oil spills in the Niger Delta region has contaminated coastal and marine habitats, wildlife, fisheries, water sources and even human activities.

The process of burning fossil fuels and gas contributes to the emission of carbon dioxide (greenhouse gas), making Nigeria one of the top global gas-flaring oil-producing countries (Elehinafe et al., 2022). For example, Nigeria flares around 23 billion cubic meters of gas annually, contributing to approximately 13% of the world's total gas flaring (Okafor, 2011). It has been reported that flaring gases rich in a liquid produce smoke and aerosols, severely compromising air quality in the region (Nwosisi et al., 2021). Crude oil exploration and oil spills have negative impacts on the Agricultural activities in the Niger Delta region. Muhammad et al. (2024) noted increased organic carbon content and the carbon/nitrogen ratio in polluted soils. The absorption of salts from drilling fluids during disposal can modify the physical properties of the soil, indirectly affecting plant growth. Studies have demonstrated that soils in the Niger Delta region affected by the adverse impact of oil and gas development undergo acidification, leading to a gradual decline in fertility and agricultural productivity (Ite et al., 2013; Sam et al., 2017; Elum et al., 2016).

This devastation has resulted in significant economic losses for local inhabitants who rely heavily on subsistence farming and fishing.

Large-scale oil and gas production in Nigeria's Niger Delta region has had profound and detrimental effects on the local communities, significantly impacting their health and mortality rates. Research indicates that crude oil-related pollution in these areas has led to a wide range of health problems. Chemical pollutants from oil spills and gas flaring contribute to cardiovascular diseases, mental health issues, allergies, and respiratory disorders. These health conditions often evolve into complex diseases, exacerbating the overall health crisis and leading to increased mortality among the inhabitants (UNEP, 2011; Nwosisi et al., 2021). Furthermore, the extensive impacts of crude oil exploration and production extend beyond health concerns to significantly disrupt the traditions and cultural values of the Niger Delta region. Contamination from oil and gas-related pollutants severely threatens cultural practices, such as the traditional river bathing rituals conducted during the New Year. These pollutants degrade the natural environment, compromising the aesthetic and communal values integral to the indigenous communities' way of life. The loss of these cultural practices, deeply rooted in the community's heritage, signifies a profound erosion of cultural identity and social cohesion (Fentiman and Zabbey, 2015). The broader environmental and social implications of the oil and gas production in the Niger Delta underscores the urgent need for strategies that address can address these challenges.

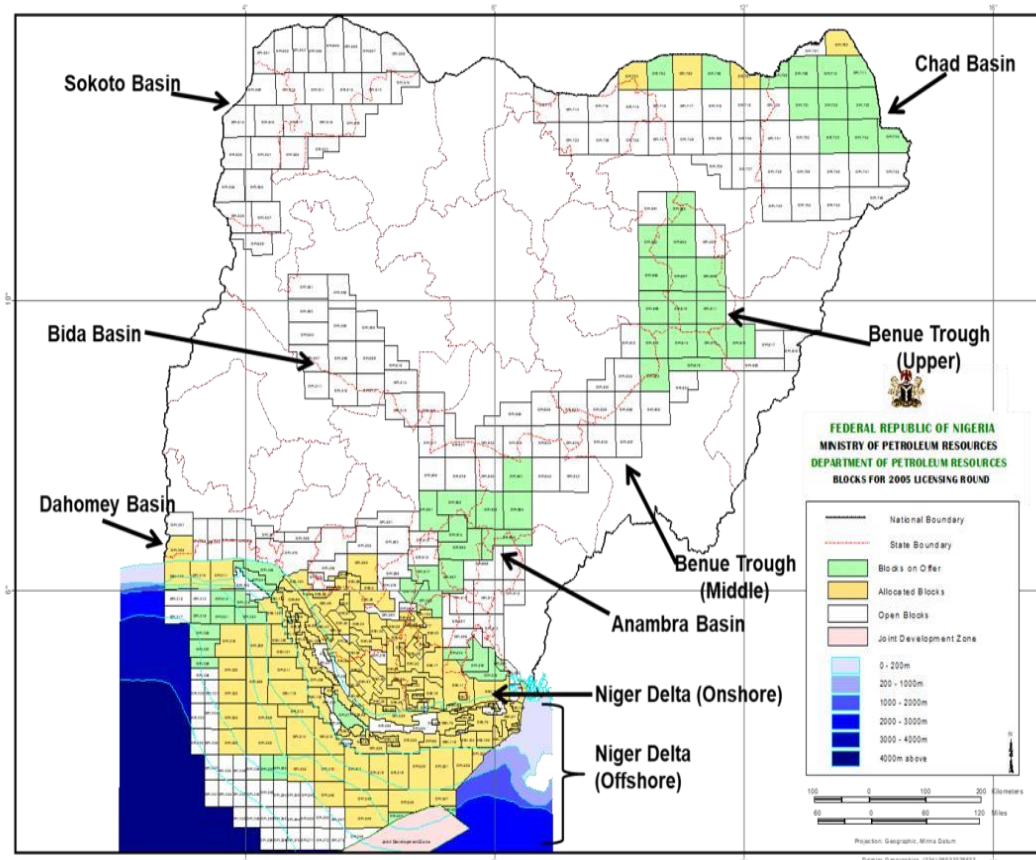
3.4 The new oil and gas frontiers in Nigeria

Despite the glaring environmental challenges in the old frontier of oil and gas exploration in the Niger Delta area, the Nigerian government remains steadfast in its determination to expand hydrocarbon development into new frontier basin regions. In 2015, confronting a decline in national revenues and committed to improving Nigeria's petro-business economy, President Muhammadu Buhari's administration intensified efforts to secure the passage of the long-pending Petroleum Industry Bill (PIB), which had been in the National Assembly since the preceding administration. Following the enactment of the PIB, the Petroleum Industry Act (PIA) of 2021 came into force, articulating the

government's aspirations to expand oil and gas development into new frontier basin regions renowned for their substantial hydrocarbon resource potential (PIA, 2021).

These regions include the Benue Trough, Middle Benue Basin/trough, upper Benue Trough (central/Northeast); Anambra Basin (South), Bida/Middle Niger Basin (Central, along the Niger Valley); Sokoto Basin (North-West border); Chad/Bornu basin (Northeast) and Niger Delta (South Coastal) (Schatzl, 1969; Akande and Erdtmann, 1998; Mukhtar and Xie, 2012; PIA, 2021; Obaje et al., 2020) (See Figure 5.2). In particular, the Chad and Benue Trough basin regions have been in hydrocarbon prospecting activities for decades. The preliminary evaluations reveal considerable reserves of natural gas in the Upper Benue Trough basins, with an estimated volumetric ratio of 75% natural gas to 25% crude oil (Obaje et al., 2022). The recent commercial discovery of oil and gas in the Kolmani River-2 well in the Upper Benue Trough is a testament to the potential of the new frontier basin regions. However, the prospects for the issuance of exploration licenses to explore oil and gas natural resources in the Upper Benue Trough region have raised concerns regarding the readiness of the government and the industry to pursue sustainable energy development, considering the long-standing environmental challenges that characterised hydrocarbon development in the old frontier in the Niger Delta region. Therefore, for all intents and purposes, there has been a growing call for sustainable oil and gas development in the new region to avert the occurrence of environmental and social impacts akin to the situation currently experienced in the Niger Delta region.

Figure 3.2: showing delineated new oil and gas frontier basins in Nigeria



Sources: Federal Ministry of Petroleum Resources

3.5 EIA and oil and gas decision making in Nigeria

3.6 Overview of the EIA system in Nigeria's oil and gas sector

In Nigeria, the EIA is considered an environmental policy instrument as it helps ensure that proposed projects align with the goal of preserving the environment and natural resources. It provides public assurance regarding the feasibility of development proposals while prioritizing the prevention and mitigation of potential environmental impacts (Ogunba, 2004). The process of institutionalising an EIA system in Nigeria can be traced back to the sudden discovery of the dumping of approximately 3880 tons of hazardous toxic wastes by an Italian corporation in 1987 in the coastal town of Koko, a territory that was part of the Bendel State at the time and is currently located in Edo State (Emeseh, 2006). This indiscriminate infringement on the environmental quality in a

remote and sleepy village in Nigeria sparked nationwide criticism. For the first time, ordinary people began to raise fundamental questions about the scale and magnitude of the negative impact of industrial pollution on the environment, the absence of a viable law that safeguards and protects the environment from indiscriminate activities of the multi-national companies that threaten the integrity of the ecosystem (Federal Republic of Nigeria, 1992; Olokesusi, 1998; Ogunba, 2004). This critical moment has ignited a demand for comprehensive reforms and a heightened awareness of the importance of environmental protection and sustainable practices. In response to public outcry, the Federal Government of Nigeria took decisive action by enacting the Harmful Wastes Decree 42 of 1988. This legislation provided a legal framework to oversee and regulate the disposal of toxic and hazardous wastes throughout the country. Subsequently, as outlined in the preceding section, numerous environmental regulations were introduced to address the impact of multinational activities and regulate aspects of associated environmental pollution in Nigeria.

However, the concept of EIA did not merit significant attention from the Nigerian government despite the public agitations for a better environment until the influence of international financial and donor organisations came into play. The introduction of EIA in Nigeria was prompted by pressure from development assessment agencies (FRN, 1995), in contrast to developed countries where the impetus often stemmed from local demand for improved environmental conditions (Wood, 2003; Lie, 2008). The development assessment agencies, with their keen interest in impact assessment, started demanding the implementation of EIA as a prerequisite for approving major industrial projects and providing financial aid in the form of loans or grants to recipient countries. As a recipient of financial assistance, Nigeria was required to incorporate EIA into its project development processes to meet the requirements set by the World Bank and other funding entities. This led to the creation of the Federal Environmental Protection Agency (FEPA) through Decree 58 of 1988 in Nigeria. The primary mandate of the Federal Environmental Protection Agency (FEPA) was to safeguard and promote precautionary environmental measures in Nigeria. In translating this mandate into action, a significant milestone was achieved in 1992 with the formal introduction of a national policy known

as the Environmental Impact Assessment Act No. 86 of 1992—mirroring the US National Environmental Policy Act of 1969 (Olokesusi 1992a; Anifowose et al., 2014).

In the view of Ogunba (2004), the promulgation of the EIA Degree regulatory framework signified a crucial step in Nigeria's commitment towards achieving greater environmental accountability and ensuring projects adhere to rigorous international standards to mitigate adverse environmental effects. Therefore, the EIA increasingly became a decision-support tool used to predict and assess the impacts of oil and gas development projects with a particular focus on identifying the appropriate mitigation measures or actions to prevent or minimise negative consequences of such development while maximising positive ones.

3.6.1 EIA system for oil and gas decision-making in Nigeria

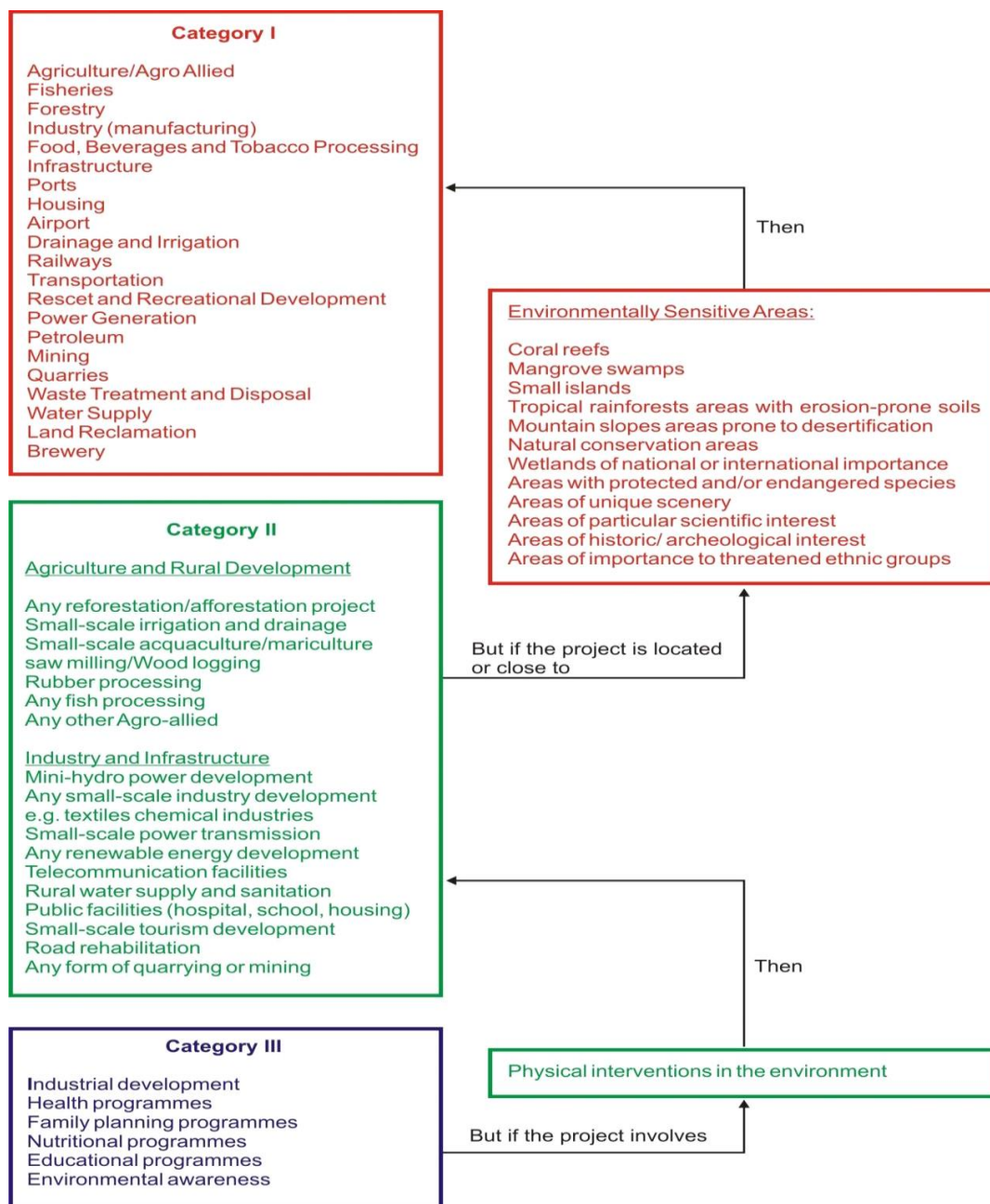
In Nigeria, the EIA legal framework stemmed from the creation of the Federal Environmental Protection Agency (FEPA) Decree No. 58 of 1988. The FEPA was initially entrusted with the legal mandate for the overall protection and the sustainable use of environmental resources in compliance with the established environmental quality standards in the country. In particular, section 5 of FEPA Decree No. 58 charged the agency with the responsibility of designing environmental guidelines standards, environmental protection and management and monitoring and enforcement of compliance with environmental measures. The statutory responsibilities of the FEPA were subsequently transferred to the newly established Federal Ministry of Environment (FME) in 1999, which was empowered to formulate and review the National Environmental Policy. This significant legislative reconfiguration laid the groundwork for the formal enactment of the EIA system in Nigeria through Decree No. 86 of 1992, after which a "Guideline for EIA Procedure" was also issued by the agency in 1994—mirroring the first principal rationale for establishing EIA system under the Petroleum Act (1969).

The EIA law requires that the public and private sectors of the economy shall not undertake, embark on, or pursue any project or activities without prior and proper consideration of the possible effect on the environment. The EIA explicitly sets regulations, guidelines and standards to safeguard the environment from the potential

impacts of the proposed oil and gas development projects. Typically, the decree grouped projects into three categories based on six criteria: project severity, scope, duration and frequency, associated risks, the significance of impacts, and availability of mitigation strategies for ancillary and potential effects identified (FRN 1992). It outlines 19 major groups of such projects under the mandatory impact assessment, a list of projects requiring compulsory EIA before issuance of authorisation, non-compulsory and certain projects that shall be given exclusive waiver at the federal government's discretion. These projects are briefly discussed below:

- **Category I**—These projects must undergo full EIAs before they can be authorised for implementation because their effects are sensitive, diverse, and could be unprecedented. As such, their potential impacts can extend beyond the geographical limit of the project and are potentially irreversible over the long term. Some examples of project types under Category 1 include oil and gas, mining, power generation, quarries, water supply and waste management;
- **Category II**—These projects are the same as those under Category 1, but such projects in Category 2 are smaller than those in Category 1. The EIA Decree also explicitly stipulates that projects in Category 2 can undergo complete or partial EIAs or environmental and social action plans may be required when originally conceived to be sited in ecologically sensitive areas; otherwise, no compulsory EIA shall be required before a development license is issued. Examples of the projects under Category 2 include mini-hydro developments and small-scale essential projects.
- **Category III**—These projects are mostly benign and are likely to be environmentally friendly with minimal or no significant environmental implications. Beyond screening, no further EA action shall be required for such project types, although some may require environmental and social action plans. Some examples of project types under Category III include educational establishment, healthcare facilities, etc. (see figure 6.1 below)

Figure 3.3: Flowchart showing checklist for the categorisation of the EIA Project



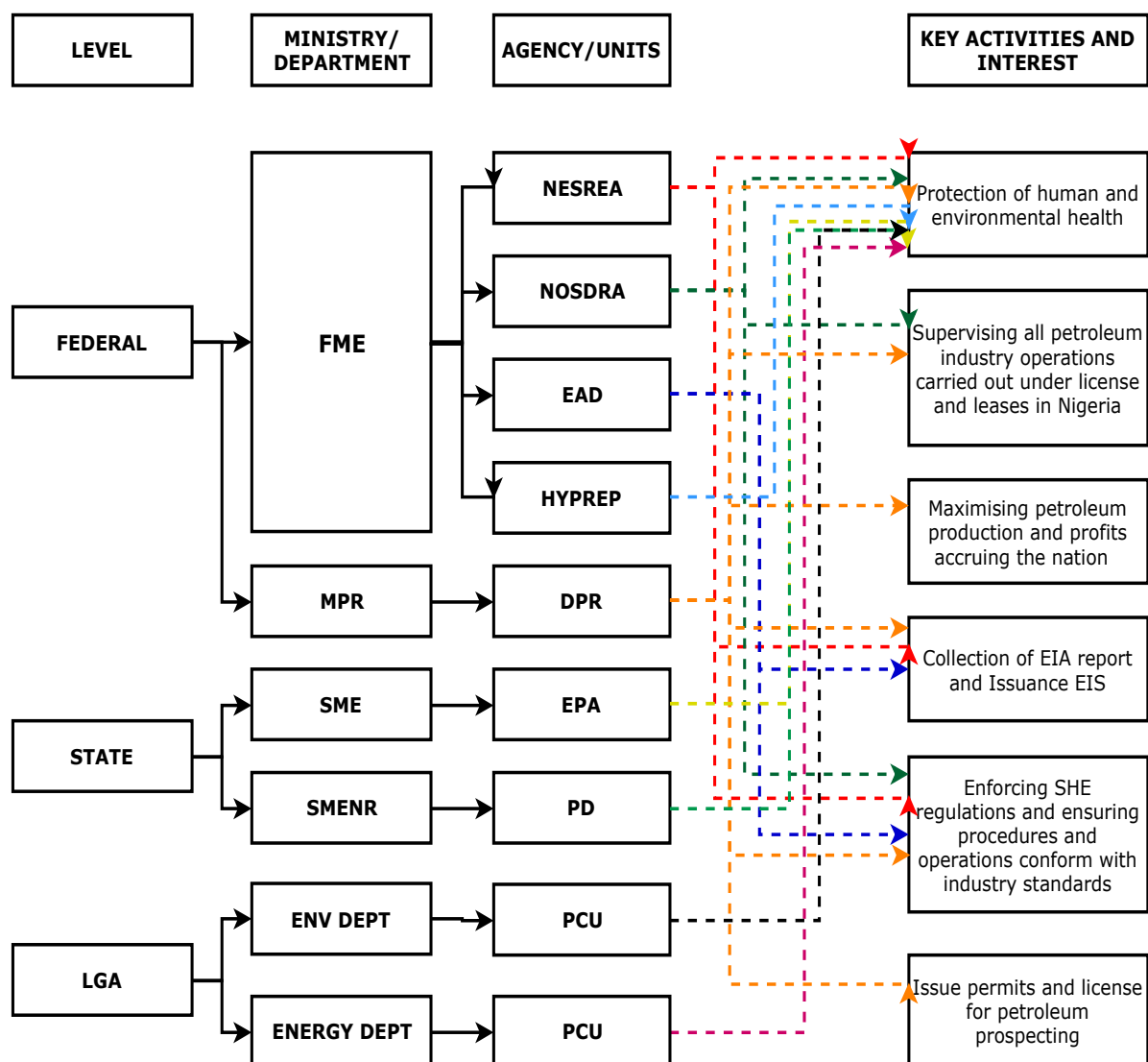
Source: Adapted from the Federal Environmental Protection Agency (FEPA, 1994)

Under the Nigerian EIA system, legislation and guidelines, the oil and gas projects fall within categories of development activity requiring an EIA under group 1 or 2. In principle, this means the EIA law provides a framework to prevent adverse environmental consequences from the hydrocarbon project development. However, in practice, it is significantly questionable or contestable whether the institutionalisation and use of the EIA approach have indeed contributed to effective environmental protection.

3.6.2 EIA institutional and regulatory framework

In Nigeria, the administrative arrangements and roles of different agencies involved in the EIA process are defined in accordance with the extant regulations and procedures governing the EIA system. Figure 3.4 below shows a pictorial representation of several key Ministries, Departments and Agencies (MDAs) at the federal, state and local government levels with varying roles, responsibilities and interactions in regulating, reviewing and approving oil and gas EIAs.

Figure 3.4: Institutional structures of the Nigerian oil and gas sector



Sources: Isa, 2018

At the federal level, the Federal Ministry of Environment (FME) and the Department of Petroleum Resources (DPR) are the key regulatory bodies responsible for EIA in Nigeria's oil and gas sector. The FME, housing four agencies, oversees environmental guidelines, standards, and overall EIA regulation. The DPR, operating under the Ministry of Petroleum Resources, plays a vital role in approving EIAs for oil and gas projects. State Environmental Protection Agencies (SEPAs) and Local Government Environmental Boards Authorities have limited powers and are not directly involved in oil and gas EIAs due to federal jurisdiction granted by the Petroleum Act 1969. The EIA guidelines exclude states and local governments from direct regulation, approval or supervision, involving them only at the review stage. Therefore, based on the guidelines and legislation for EIA in Nigeria, the FME and the DPR are the two principal agencies governing the EIA processes within the oil and gas sector. The EIA extant legislation and guidelines require each consultant/preparer to register with the DPR and FME to partake in the EIA exercise. This approach has resulted in the operationalisation of a dual-track EIA system in the oil and gas industry (Ambituuni, 2014; Eneh, 2011).

In addition, various other agencies also play significant roles in Nigeria's oil and gas decision-making and management. The National Oil Spill Detection and Response Agency (NOSDRA) is responsible for oil spill detection and remediation of contaminated sites. However, there are concerns regarding conflicting mandates and administrative responsibilities between NOSDRA and the DPR in tracking, reacting to, mediating, and reporting oil spill incidents. Operators tend to prioritise compliance with DPR's regulations over NOSDRA's. Likewise, the National Environmental Standards and Regulations Enforcement Agency (NESREA) plays a crucial role in regulating environmental guidelines and policies in Nigeria, including the National Policy on the Environment. However, the agency's jurisdiction has a notable omission in the form of the exclusion of environmental problems arising from oil and gas-related operations from its purview sections 7 (g), (h), (j), (k), and (l). Despite this, observational evidence indicates that NESREA's functions encompass oil and gas, as specified in section 7(c), but section 8 suggests that the agency's powers do not extend to the petroleum industry. This exemption appears to conflict with other clauses of the NESREA Act, particularly

section 7 (c), which grants the agency authority to enforce compliance with international environmental agreements, including the oil and gas sector.

Moreover, the inclusion of a representative of the multi-national oil firms on the Governing Council of NESREA raises questions about the Section 7 restriction. Furthermore, the designation of NESREA as the primary environmental regulator under the National Policy on Environment (NPE) seems to be at odds with its inability to address environmental problems arising from the petroleum industry, which is recognised as a cornerstone of national development in Section 4.14 of the NPE. Consequently, given the potential environmental and socio-economic implications of oil and gas operations, it is difficult to understand how NESREA can ensure the sustainable development of the sector without engaging in oil and gas environmental issues (Ladan, 2012; Adomokai and Sheate, 2004). In the context of this thesis, it is imperative to examine the regulations and protocols employed by the Federal Ministry of Environment (FME) and the Department of Petroleum Resources (DPR), both of which are tasked with receiving, authorising, and overseeing the EIA process for oil projects in Nigeria.

3.6.2 Decision-making process

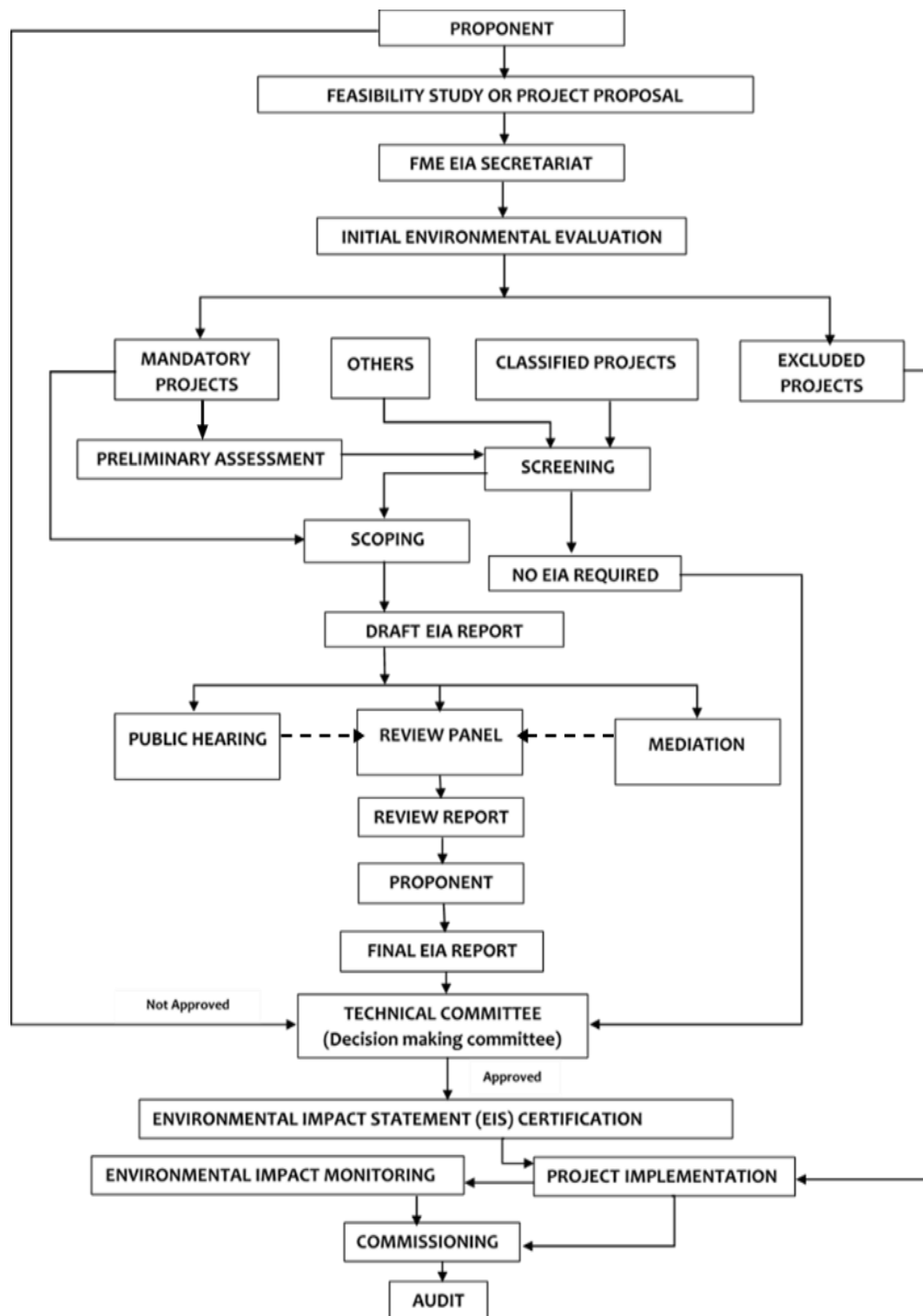
Given the institutional and legal requirements, Nigeria currently operates two independent EIA regulations in the oil and gas sector: the Federal Ministry of Environment (FME) EIA system and the Department of Petroleum Resources (DPR) EIA system. This is because two competent administrative authorities are responsible for overseeing the technical matters relating to carrying out oil and gas EIAs as required under Decree No. 86 of 1992 and the Petroleum Act of 1969 (Anifowose et al., 2014; FRN 1969). The following sections unearth the EIA procedural steps as enshrined in the two distinctive approaches.

3.6.3 The Federal Ministry of Environment EIA system

The FME is responsible for the planning, initiating and developing environmental policies in Nigeria. The FME operates as the premier environmental watchdog responsible for regulating and administering environmental standards and regulations for the development of oil and gas projects (FEPA, 1995). In particular, part III, section A of the

EIA Act empowers the FME to design comprehensive EIA procedural and sectoral guidelines for oil and gas projects. The procedural guidelines cover Category I projects (i.e. mandatory study activities) and are listed under item 15, sub-item (a) oil and gas fields development, making an EIA compulsory for the proposed project. The FME EIA guidelines outline a stepwise approach for the procedural and practical execution of the EIA process from project conception or proposal to approval and issuance of an Environmental Impact Statement (EIS) and certificate. The guidelines are intended to assist in the proper and detailed implementation of the EIA process of projects in consonance with the EIA Act and guarantee that the project is developed with maximum consideration for the environment. The steps involved include Project proposal, Initial Environmental Examination (IEE), Screening, Scoping, EIA Study, Review, Decision making, Monitoring and Auditing (See Figure 3.5. below).

Figure 3.5: Flow chart of FME EIA process and procedural framework



Sources: FRN (1995)

A project proponent or developer is required to initiate the process in writing to the competent authority responsible for EIA regulations and approval, describing the proposed project. The FME conducts an Initial Environmental Examination to categorize the project and determine the need for a complete EIA procedure. If potential environmental implications exist, a screening report is sent to the proponent, who prepares a draft EIA scope report. This report is submitted for consideration, and if necessary, Terms of Reference (ToR) are established. Local communities have the opportunity to participate during the EIA review process by providing comments on publicly displayed project reports for 21 working days. The Federal Ministry of Environment evaluates these comments and provides them to the proponent. The proponent then submits the final EIA report within six months, addressing review comments. If the report is unsatisfactory, the FME may communicate a 'no project' decision. Upon receiving a satisfactory final EIA report, the technical committee approves and issues an EIA certification with conditions and a validity period, allowing the project to proceed. A revised EIA report is required for revalidation if not commissioned within the specified period. During implementation, the FME monitors the project to ensure compliance with specified conditions and mitigation measures, ensuring adherence to environmental recommendations.

3.6.4 The Department of Petroleum Resources EIA system

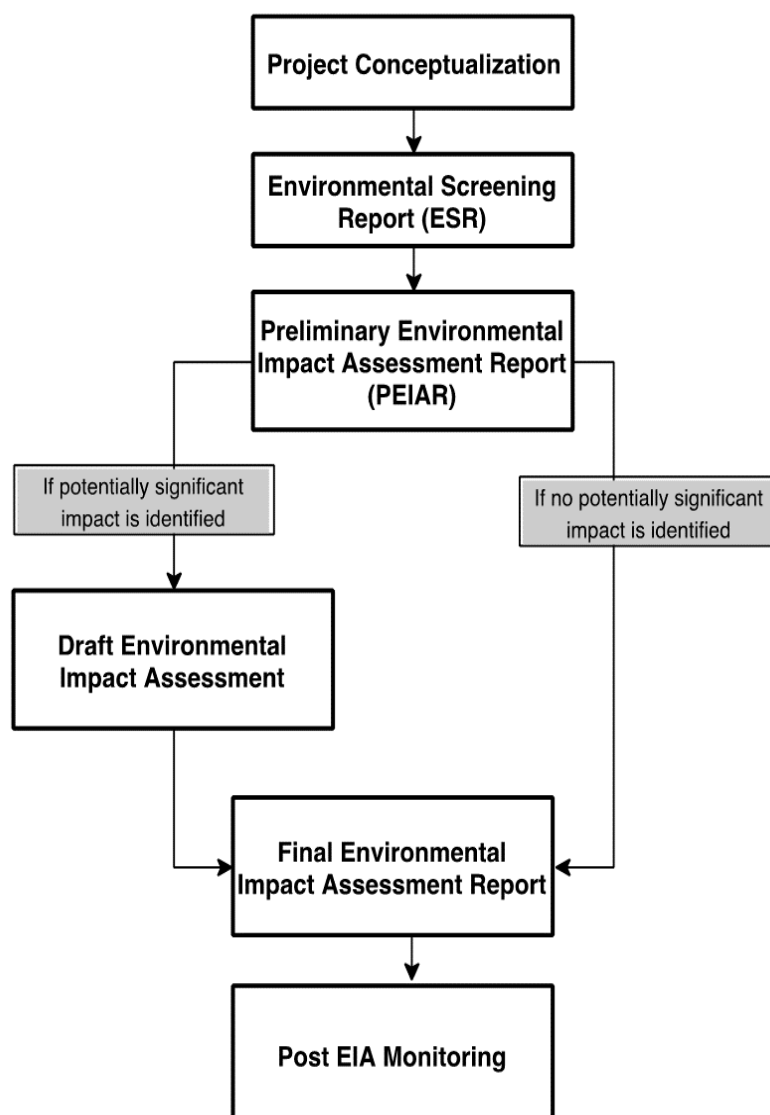
In consonance with statutory provisions of the Petroleum Act of 1969, the Department of Petroleum Resources —a parastatal of the Federal Ministry of Petroleum Resources is empowered as a competent administrative agency responsible for environmental protection and pollution management in the oil and gas industry (DPR, 2020). The principal mandate of the DPR is to compel proponents or developers interested in the oil and gas venture business in Nigeria to produce and submit an EIA report based on its process and procedures to meet the guidelines and environmental standards to ensure that the current status of the environment and the development of oil and gas resources does not significantly damage prospects for use by future generations (Ambituuni et al., 2014). In order to achieve its mandates, the agency developed the "Environmental Guidelines and Standards for Petroleum Industry in Nigeria" (EGASPIN), first published in 1992 and later amended in 2002, covering oil and gas exploration, production operations,

hydrocarbon processing, pipeline lines installations, permits, sanctions and pollution abatement technologies. Specifically, the DPR requires the following category of oil and gas projects to go through an EIA process (DPR, 2009: p. 19).

- Seismic operations
- Oil and gas field developments for onshore, near-shore, offshore and deep offshore development (well drilling, construction of crude oil production, tank farms and terminal facilities including floating production, storage and offloading vessels;
- Laying of crude oil and gas delivery lines, flow lines, and pipelines in cumulative excess of 20 km in length and/or as determined by the Director of Department Petroleum Resources;
- Hydrocarbon processing facilities such as oil refineries and petrochemicals, liquefied natural gas, blending plants, and product filling stations (combined capacity above 20, 000 litres);
- Construction of product depots with combined capacity;
- Construction of waste treatment and/or disposal facilities (wastewater treatment plant, incineration process above 300 kg/hr, and engineered sanitary landfilling) and
- Dredging activities greater than 500 m³

In order to facilitate effective regulation, supervision, monitoring and enforcement of health, safety, and environmental standards within the petroleum industry, the DPR developed EIA procedural and technical steps, which serve as the minimum threshold for the proponents to strictly comply with before undertaking any form of petroleum-related development activities. In addition, the version of the DPR EIA system involves an Environmental Evaluation Report (EER) to evaluate polluted environments and recommend remedial measures to enhance the ecological state. The steps involved in the EIA procedure under EGASPIN are briefly discussed (See Figure 3.6.).

Figure 3.6: The EIA procedure under EGASPIN



a. Project Conceptualisation:

The developer or proponent is required to conceptualise and submit a comprehensive proposal for the project to the DPR.

b. Environmental Screening Report (ESR):

The initiator and DPR usually carry out initial environmental screening and scoping of key concerns in the first instance. The outcome of the initial evaluation often underpins decision-making.

c. Preliminary Environmental Impact Assessment Report (PEIAR):

Preliminary evaluation of potential effects, which comprises comprehensive scoping by the project initiator, DPR and other relevant actors, takes centre the stage under the PEIAR stage.

d. Draft EIA Report:

Upon completion of the conceptual project design, the initiator shall prepare and submit it to DPR for assessment. This will serve as the foundation for DPR's approval of the detailed engineering design after reviewing the conceptual design. This stage often requires a mitigation plan as subsidiary documents or report clauses.

e. Final EIA Report:

A comprehensive construction plan shall be prepared by the initiator and submitted to the DPR before the commencement of any construction operations. It shall include the implementation of mitigation strategies, Post-EIA monitoring and a post-auditing program.

f. Post EIA Monitoring:

In this stage, the DPR requires quarterly reports and annual inventory visits to the site. However, the EIA approval may likely lay out additional requirements where necessary.

3.6.5 Similarities and differences between DPR and FME EIA systems in the oil sector

In principle, the dual-track EIA system was established to achieve a common goal for a more robust process through approval or disapproval of oil and gas projects based on the quality of EISs. However, the operationalisation of two EIA systems is perceived to be duplicative, overlapping and often conflicting between the roles and responsibilities of the DPR and the FME (Eneh, 2011; Olokesusi, 1998; Ogunba, 2004). This is mainly because the DPR EIA system was initially designed to focus on sector-specific, i.e. the oil and gas-related activities through the Petroleum Act of 1969 and the Environmental Guidelines and Standards for the Petroleum Industry In Nigeria (EGASPIN), while the incorporation of the aspects of hydrocarbon project development into the FME EIA

system is often perceived as an after-thought since the Decree No. 86 of 1992 establishing the national EIA guidelines appear to encompass all the sectors of the Nigerian economy (Ogunba, 2004; Olukesusi, 1998). Therefore, this means that developers within the petroleum industry are required to submit two EIA reports containing information similar to those of both authorities. As such, there seem to be similarities between the DPR and the FME procedural steps. For example, the FME emphasises comprehensive public consultations, panel reviews, and conflict resolution, while the DPR prioritises interpreting the significance of environmental impacts with limited public participation.

However, neither of the EIA systems incorporates SEA principles in their planning and decision-making frameworks. This constitutes a notable gap that needs to be addressed by integrating strategic thinking into Nigerian petroleum sector decision-making to plan for oil and gas development toward sustainable development. The following Table illustrates some of these similarities and differences between DPR and FME EIA systems in the oil sector.

Table 3.1 Similarities between DPR and FME EIA systems in the oil sector

Components	FME EIA system	DPR EIA system
Legal and policy framework	EIA Decree No. 86 of 1992	EGASPIN procedural guideline 1991
Amendment	The FME EIA system was amended in 2010	The DPR EIA system was reviewed in 2002
Entry point	Notice of intent in writing	Notice of intent in writing
Procedural stages	Report preparation	Project Conceptualisation
	Initial Environmental Evaluation (IEE)	Environmental Screening Report (ESR)
	Screening Report	Preliminary Impact Assessment Report
	Mandatory Study Report	Draft Environmental Impact Assessment Report
	Public participation and review	
	EIA approval	Final EIA Report
	Impact Mitigation Monitoring (IMM)	Post EIA Monitoring
Provision of SEA	No provision for SEA	No provision for SEA

Table 3.2 Differences between DPR and FME EIA systems in the oil sector

Components	FME EIA system	DPR EIA system
Sectoral coverage	All sectors of the economy	Oil and gas sector
Statutory powers	Functions apex regulator	Micomangaeg by its primary organisation (NNPC)
Time-frame for EIA conduct	1-6 months	Not specified
Public participation	Requires elaborate public forum, panel review	Recommends limited public participation in the interpretation of impact significant
Timeline for the public participation and review process	21 days	Not specified
Criteria to hold public meeting/hearing	depend on the decision of the ministry or agency	Depend on the decision of the proponent or agency
Access to information	Final EIA report	Environmental management plans
Information provision	government office, agency or ministry office	Internet or newspaper
Public participation mechanism	Public meetings/hearings	focus groups, public opinion surveys, consensus conferences or citizens
Information presentation	non-technical way	Technical way
Opportunity for appeal	Yes	Not specified

3.7 Key stakeholders in the oil and gas EIA regime

The DPR and the FME officially recognize a list of stakeholders involved in Nigeria's oil and gas EIAs. This list includes developers, EIA consultants, community members, government regulators, and various actors such as environmental NGOs and representatives from the private sector. However, upon closer examination through document reviews and field visits conducted for this study, it becomes evident that the landscape of stakeholders actively engaged in the petroleum sector extends far beyond the initially identified groups. In reality, a diverse and expansive array of stakeholders actively participates in and influences key decision-making processes within the petroleum sector. This broader spectrum includes entities involved in lobbying, advocacy, and direct involvement in shaping policies and projects related to oil and gas activities. These stakeholders often bring unique perspectives, interests, and concerns to the table, reflecting the multifaceted nature of the petroleum industry and its interactions with the environment and society. The Table below illustrates the different stakeholders involved in the oil and gas EIA process and their respective roles. However, the level and effectiveness of their participation in the EIA process can vary significantly due to their different levels of interest and power.

Table 3.3. Key actors and their roles in the oil and gas sector

Category	Actors	Roles
Federal Government MDAs	Ministry of Environment and Department of Petroleum Resources	These competent administrative bodies are involved in the formulation and regulations of oil and gas EIAs to mitigate the likely impacts of hydrocarbon development on the environment
State/Local Government MDAs	State Environmental Protection Agencies (SEPAs) and the Local Government	Participatory roles in the oil and gas EIAs

	Environmental Boards Authorities	
Oil companies	Agip, Chevron, Elf, Shell, Texaco and Mobil etc	As proponents in the petroleum industry, oil companies are required to initiate an EIA by engaging certified impact assessors to undertake EIAs on their behalf before project development in accordance with relevant legislation governing the EIA in Nigeria. They are also required to undertake monitoring based on existing legislation and best practices as enshrined in the EIA Act.
Financial institutions/ Donors and aid organisations	World Bank, International Monetary Funds, Nigerian Banks, Fund Managers, Financial Intermediaries and others	The financial institutions' requirements are based on the PPP design but are often settled for the following in the absence of SEA. - Project categorisation for environmental assessment - Applicable standards - EA categorisation and scoping - EIA Study - Environmental and social impact investigators - Funding
Professional s/ academics,	EIA Consultants and EIA academics experts etc.	These are private consultants or academic experts certified by the Professionals Environmental Association in Nigeria. The proponent or developer often contracts them to conduct EIAs reports and Environmental Management Plans on their behalf.
Non-governmental organisations (NGOs)	Non-state organisations, structures and non-market organisations in which people of like-minds	As non-state actors, these groups of people are expected to carry out day-to-day environmental awareness campaigns to pressure the prominent key actors to comply with environmental standards to protect the ecological and biological environment.

	organise to pursue shared objectives and ideals of environmental quality	
Communities members	Farmers, fishers, professional associations, community-based organisations (CBOs), religious groups and others	These individuals or groups may be potentially affected by oil and gas development. They are legally supposed to be consulted during the EIA scoping and EIA public reviews/hearings to input into the decision-making process for oil and gas development in their vicinity.

Sources: document review and field data

3.8 Power dynamic and relation in Nigeria's oil and gas sector

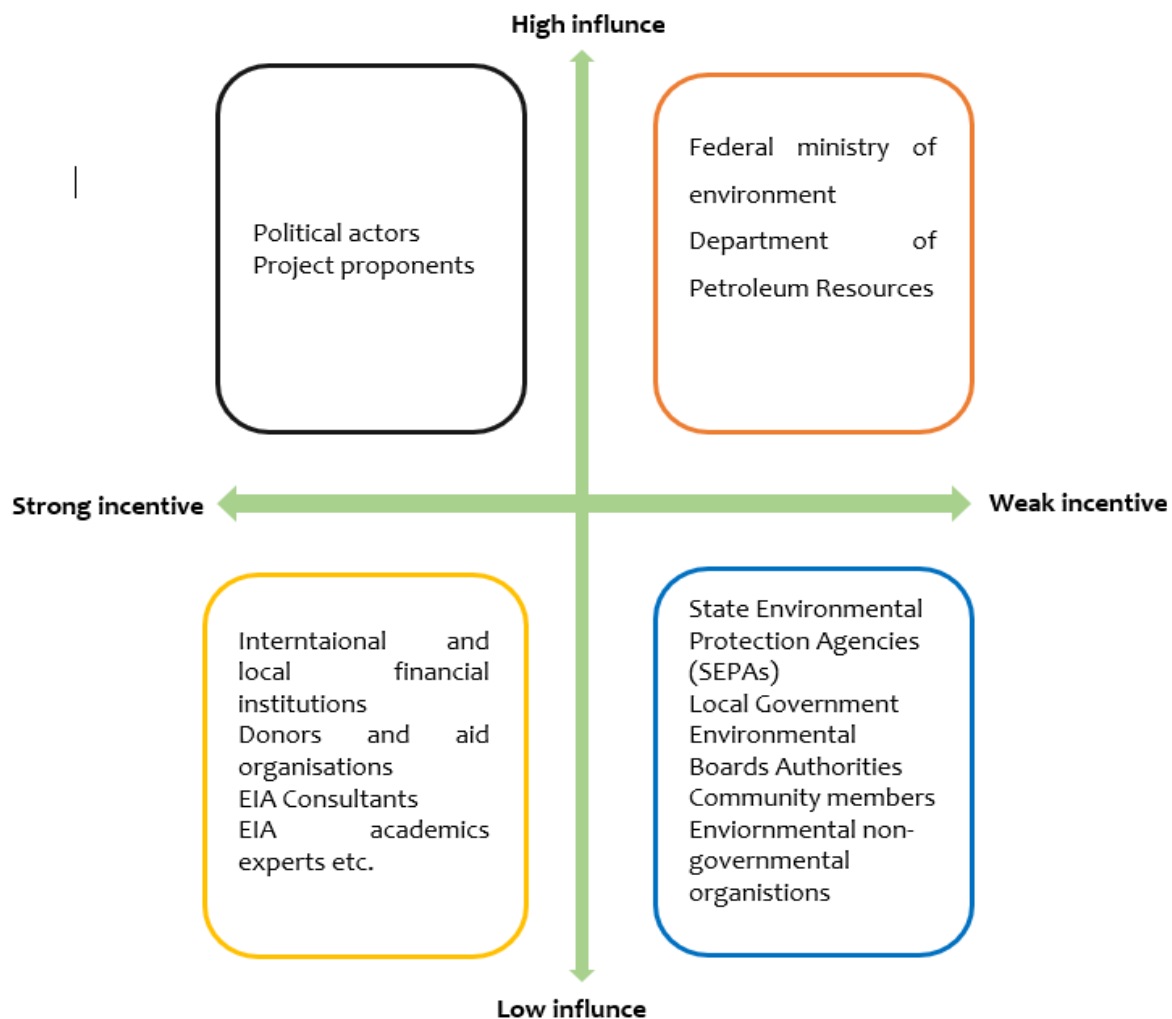
Nigeria's oil and gas sector is significantly characterised by complex power dynamics and value conflicts (Ambituuni et al., 2014). Evidence indicates that the FME and DPR hold considerable power and interest, as these Federal government agencies are responsible for regulating and approving oil and gas EIAs to ensure environmental protection and management (See Figure. 3.7). However, significant conflicts arise from horizontal power struggles among these federal agencies, resulting in overlapping mandates and inconsistent regulatory practices. For instance, ambiguity surrounds the FME's collaboration with agencies like the DPR on environmental protection and resource conservation. Although FME is tasked with working alongside these bodies, the extent and clarity of such collaboration remain undefined. Similarly, the National Environmental Standards and Regulations Enforcement Agency, a body under FME, is marginalised in regulatory discussions related to oil and gas activities despite its central role in environmental oversight as per the NESREA Act. Such overlapping roles lead to bureaucratic inefficiencies, wasted resources, and weak enforcement (Eneh, 2011).

Further conflicts between federal and state governments involve jurisdictional control over the environmental impacts of oil and gas exploration due to the prevailing top-down

environmental governance structure in Nigeria (Emeseh, 2012). Oil operations occur within state boundaries, making local governments essential stakeholders, yet they often lack regulatory authority. These issues stem partly from the Federal Environmental Protection Agency's framework, which involves state agencies only at the EIA review stage. This limited engagement often creates friction and redundancies, requiring multiple EIA reports and leading to resource inefficiencies (Echefu and Akpofure, 1999; Nwafor, 2006). While public participation is a key component of the FME's EIA process, stakeholder engagement remains ineffective, creating minimal cooperation between federal and state agencies. Beyond governmental bodies, stakeholders in Nigeria's oil and gas sector include community members, oil companies, and EIA practitioners, each with varying degrees of influence. This discrepancy in power and interest often leads to imbalances (Ambituuni et al., 2014).

The power matrix reveals that regulatory agencies wield the most influence due to their mandate in EIA approval, while oil companies, financial institutions, and EIA consultants prioritize economic incentives. In contrast, community members, NGOs, and civil society organizations emphasize environmental and sustainability goals. Major oil companies, including multinational and indigenous firms, sometimes leverage relationships with political leaders and high-ranking officials to bypass EIA processes, sidelining essential stakeholder groups, especially local communities affected by oil activities in the Niger Delta region. Consequently, EIAs are often conducted by the FMEnv and DPR without sufficient local engagement, particularly in areas most affected by oil exploration and production. In summary, Nigeria's oil and gas sector is challenged by power imbalances, regulatory conflicts, and insufficient collaboration among stakeholders, underscoring the need for a more unified, transparent approach to sustainable resource development.

Figure. 3.7: Stakeholders in the power/interest matrix in Nigeria's oil and gas industry.



Source: Author generated

3.9 Chapter Summary

The EIA system in the Nigerian oil and gas sector is the subject of the discussion in this chapter. It began with tracing the historical development of oil and gas exploration and production in the old frontier in the Niger Delta region, alongside the decades-long environmental challenges within the region. The chapter also discussed the new frontier basin of oil and gas development. The current evolution of the EIA, as well as legal and institutional arrangements and regulations, were discussed. The twin-track EIA system took centre stage, with a particular focus on the principal regulatory bodies—the Department of Petroleum Resources and the Federal Ministry of Environment. Legislation and guidelines governing each distinct entity were critically reviewed, such as

the Petroleum Act of 1969 and EGASPIN 2002 for the DPR, Decree No. 86 of 1992 and EIA procedural guidelines 1995 for the FME. A comparative analysis of the dual silos EIA system of the DPR and the FME enriched the discussion, highlighting similarities and disparities. The chapter concludes by identifying the critical actors within Nigeria's oil and gas industry and the power dynamics among the key stakeholders.

CHAPTER FOUR

Transition Theory and Frameworks

4.1 Introduction

This chapter presents the literature review conducted for the theoretical background of this research. It provides an in-depth discussion of several key concepts and insights that are essential to understanding transition management theory, with a particular focus on the Multi-level Perspective (MLP). The MLP offers an analytical lens for exploring the prospects of a transition from project-level assessment to a strategic approach in Nigeria's oil and gas environmental management regime. The chapter also reviews the main critiques of the MLP and concludes by articulating the justification for employing the MLP of transition theory in the context of this study.

4.2 The concept and nature of transition theory

The term "transition" is derived from the Latin word "transitio," which signifies "the process of change from one state to another" (Loorbach, 2017: p. 605). The concept of transitions has been examined across a variety of disciplines, encompassing multiple system perspectives, including complex adaptive systems (Loorbach, 2004; De Haan, 2006; Van der Brugge, 2006), socio-technical systems (Geels, 2002; Berkhout et al., 2004; Kemp et al., 1998; Schot and Rip, 1997), and innovation systems (Smits and Kuhlmann, 2004). Furthermore, transition theory has found applications within the social sciences, particularly in the analysis of demographic transitions, which describe the shift from periods characterized by high birth and death rates to those marked by lower rates (Davis, 1945; Thompson, 1929). In recent discussions, scholars such as Rotmans, Kemp, and their colleagues (Rotmans et al., 2000; Rotmans and Loorbach, 2001; Rotmans et al., 2001) have integrated the concept of transition into the realms of sustainable development, policy-making, and governance. The application of transition theory to sustainable development has increasingly been associated with sustainability transitions, which denote significant societal changes essential for addressing complex challenges. As highlighted by Loorbach et al. (2016) and others (Kemp, Loorbach, and Rotmans, 2007; Rotmans et al., 2001), a fundamental tenet of transition theory is the necessity to

comprehend structural societal changes in order to devise effective governance mechanisms and strategies aimed at resolving intricate societal issues.

At the heart of transition theory is the proposition that the emergence of the network society facilitates a ground for an accelerated pace of globalisation, modernisation and technological development, which has continuously bred symptoms of unsustainability capturing what Rittel and Webber (1973) termed "wicked problems" and Hisschemoller (1993) described as "persistent problems". These issues encompass a spectrum of problems such as environmental degradation, climate change, biodiversity loss, and social and economic inequalities and social challenges that manifest at the global and local levels (Loorbach, 2007). The degree and scale of these persistent problems are complex, unstructured and interrelated since they are deeply rooted in the societal strands of institutional and governance structures, micro-economic establishments and technological domain and often occur at multi-dimensional levels involving issues of power and politics and a plurality of actors with contrasting viewpoints, thinking, norms and values (Rotmans et al., 2001). Despite these complexities, existing patterns or approaches to addressing these societal problems have been deeply entrenched in the command and control problem-solving technique of scratching the surface of the problem and applying conventional short-term solutions. However, this approach is increasingly recognized as inadequate and often leads to sub-optimal solutions or, in most cases, is seen as wholly antithetical to a sustainable and desirable outcome (Rotmans et al., 2000; Loorbach, 2007; 2010).

Addressing such complex societal challenges will require developing new innovative approaches or governance systems that can consider the inherent challenges of sustainability and, in doing so, identify and embrace the competing interests, values, opinions, and disparate objectives. This problem-solving approach can potentially promote innovative solutions anchored on learning, interaction, deliberation, experimentation and co-management (Loorbach and Rotmans, 2006). By adopting this innovative approach, it is possible to formulate a long-term vision capable of radically transforming societal governance arrangements. This transformation may likely play a key role in driving changes in the prevailing routines, thinking patterns, values, and

cognitive mental barriers that constrain the potential for a more sustainable future (Geels, 2002, 2005; Grin et al., 2010).

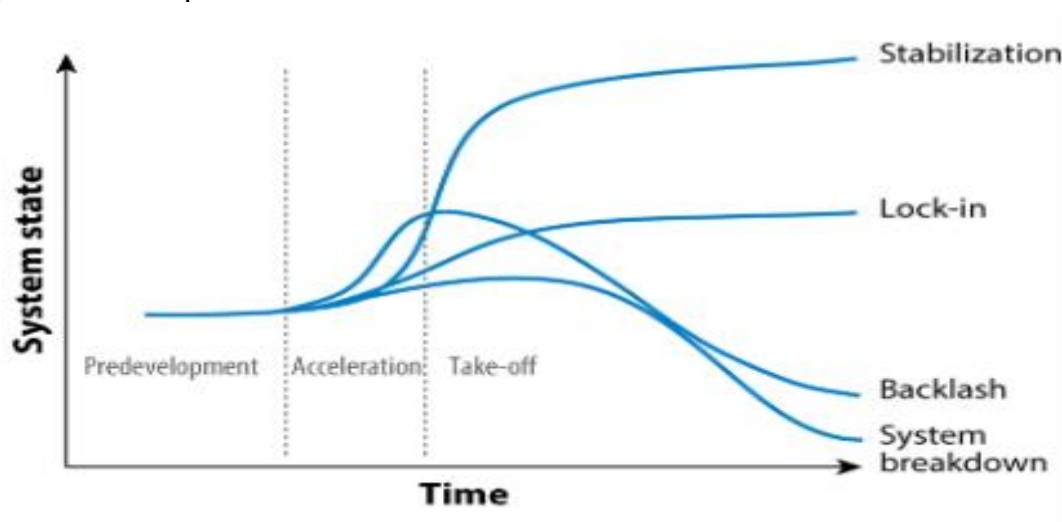
However, achieving a successful transition across institutions, technology, economy, culture, ecology, and society presents formidable and inspiring challenges for decision-makers, private sectors, civil society, the general public, and, in particular, the governance and policy-making process. This is because organizing and steering a transition is typically a long-term, unstructured, interdependent, interactive, dynamic, and contested process (Loorbach et al., 2017). Therefore, in order to explore the potential for facilitating transformative changes from entrenched practices of persistent unsustainability in governance, policy, or society, it is imperative to comprehend the underlying system dynamics inherent in transition theory. Radical or transformative changes, by definition, emerge from interactions across multi-dimensional, multi-level, and multi-domain dimensions, involving a myriad of causal factors that intricately interact and reinforce each other, leading to a fundamental reorientation in a societal system. Systematically structuring such trends and complexities and comprehensively analyzing the transition process requires considering the patterns of dynamic systems as the starting point of transition. Therefore, proponents of the transition school of thought argue that transition theory, rooted in the complex system paradigm, provides the conceptual lens necessary to analyze and understand these intricacies. The transition theory rests on two key underlying concepts: the multi-phase and multi-level perspective. As articulated by Loorbach (2007) and Grin et al. (2010), these concepts are interconnected, providing a framework for broad thematic inquiry to fundamentally understand and analyse the dynamics influencing and shaping a transition process toward a more sustainable trajectory.

4.2.1 Multi-phase level transition

The multi-phase framework of transition theory posits that transitions are not merely linear, straightforward, or predictable processes; instead, they often manifest as disruptive changes that occur in a shock-wave fashion. Rotmans et al. (2011) and Geels (2002) note that transitions typically initiate gradually during the take-off stage, gaining momentum during the acceleration phase, while a relatively slow progression

characterizes the pre-development and stabilization stages. This dynamic multi-phase process is visually represented by an S-curve, as depicted in Figure 4.1. The S-curve graphically illustrates the inherent non-linearity and complexities of the transition process, highlighting that the process is underlain by four distinct phases with varying intensities and transformation rates. The following subsections briefly highlight the multi-phase level transition process.

Figure 4.1: Multi-phase level



Source: Rotmans et al., (2001)

4.2.1.1 Pre-development phase

The pre-development represents a stage wherein aggregates of transformative ideas or innovation begin to emerge at an individual level. As the innovations attract attention at this stage, they might be a source of concern to the prevailing system that appears stable with the status quo. However, despite the growing awareness and innovative ideas that may appear as a threat from the individual actor to the dominant system, changes rarely occur at this stage. This reluctance to change is attributed to the well-established and resilient nature of the existing system, which has the capacity and influence to resist disruptive changes (Rotmans et al., 2001).

4.2.1.2 Take-off phase

The take-off stage, also known as the tipping phase, is where the transformative process can be a force to reckon with because certain innovative ideas and practices have penetrated the dominant system. The creative thinking or belief herein can gradually begin to alter some elements of the prevailing system. This phase is often influenced by wider socio-political, economic and institutional game-changers (Rotmans et al., 2011; Olsen et al., 2014). Although transformative changes typically do not occur instantaneously herein, a certain degree of experimentation becomes visible, stronger and more realistically feasible at this stage due to the involvement and collaboration of like-minded actors committed to effecting changes within the dominant system.

4.2.1.3 Acceleration phase

The acceleration phase is a breakthrough stage in the multilevel transition process. This stage is crucial as it represents the culmination of ideas and innovations initiated and promoted at the pre-development and take-off stages, leading to accelerated transformative changes. According to Rotmans et al. (2001), at the acceleration phase, there is a likelihood that the new innovative ideas will become the mainstream practice within the system and among the actors.

4.2.1.4 Stabilization phase

The stabilization stage absorbs the take-off and rapid transformative changes that cascade downward from the preceding phases to a more stable and consolidated state. During stabilization, the speed and intensity of transformative changes decelerate as the innovative practices gain broad-based support and become the predominant norm within the system (Van der Brugge et al., 2005; Loorbach and van Raak, 2006). Therefore, innovative ideas and practices that were once experimental and disruptive gradually become ingrained in the fabric of the system. Accelerating to a new dynamic equilibrium indicates a period of relative stability, where the changes that began in earlier stages have been institutionalized and normalized with a particular system.

It is imperative to note that not every change or reconfiguration results in a successful transition; rather, such changes may also precipitate system failures, entrenchment, or

adverse reactions (Geels, 2004). This indicates that transitions can lead to both favourable outcomes and undesirable shifts within a society, system, or specific governance framework. Furthermore, a transition is not the result of a singular trend or event; instead, it is propelled by the cumulative and mutually reinforcing effects of a diverse array of trends or significant changes (Geels, 2004; Verbong and Geels, 2010). Transitions unfold in various phases (Grin et al., 2010; Olsen et al., 2014), involve a broad spectrum of stakeholders (Loorbach, 2007), and are fundamentally characterized by a series of events that are intricate and uncertain (Loorbach, 2007; Geels and Schot, 2010). The subsequent subsections will explore the transition process through the lens of the Multi-level Perspective framework.

4.3 Multi-level perspective framework

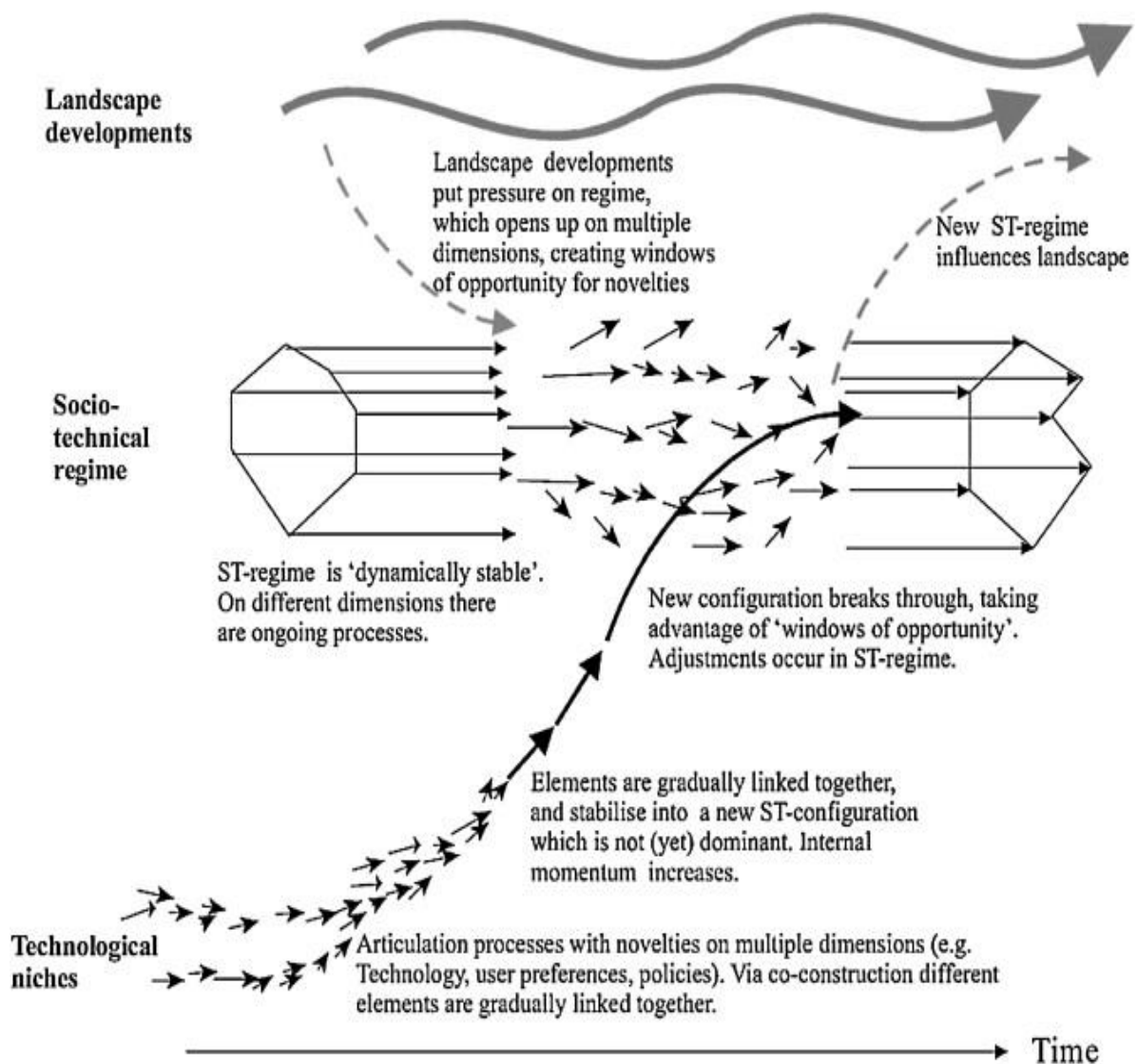
The multi-level perspective (MLP) was originally conceived and developed by Arie Rip and René Kemp in 1998 and subsequently enhanced by Frank Geels in 2005, along with contributions from Grin et al. in 2010. A fundamental tenet of the MLP is that transitions do not occur as isolated events; rather, they emerge from a web of interconnected developments and trends (Geels, 2002; 2004; Elzen et al., 2004). This dynamic viewpoint emphasizes that transitions arise from a complex interaction of interdependent occurrences, where various trends mutually reinforce one another at co-evolutionary levels. Consequently, to comprehend the potential for transformative changes or transitions, the MLP serves as a significant analytical framework (Geels, 2004; Schot et al., 1994; Geels, 2005). The MLP delineates three distinct analytical and heuristic levels: landscape, regime and niche innovations (Geels, 2011; Smith et al., 2010; Schot and Geels, 2008). The subsequent sections briefly discuss each of the MLP phases illustrated in Figure 4.2.

4.3.1 The landscape

The landscape context harbours and induces political, deep social and cultural norms and the institutions of a society that exert pressure on the prevailing regime or system (Smith and Gurin, 2010). It is often characterized by incremental trends and shock-wave development events. These events and trends that emerge from the landscape environment are often beyond the influence and remit of the existing regime and

incumbent actors. They include sustainability issues, macro-economic drivers, political ideologies and climate change concerns (De Haan, 2010; Lachman, 2013). According to Smith et al. (2010), landscape forces or game-changers can induce significant opportunities for niche innovation and/or represent a source of pressure for regime change.

Figure 4.2: Multi-level perspective on transitions



Source: Adapted from Geels (2002:1263)

4.3.2 The regime

The regime level (meso level) consists of a set of rules, interests, norms, beliefs, habits and practices embedded in a political, social and institutional context and the network of actors who design and shape a society, system, public policy or governance (Holtz et al., 2008; Geels and Sachot, 2007). The regimes are the prevailing mainstream practices, rules and shared perspectives ingrained in governance, corporations and institutions that are seemingly stable. Actors within the regimes are often willing to defend the existing arrangement and shared assumptions rather than change the dominant unsustainable system. In this respect, the regimes rarely undergo reconfiguration or transformation because the powerful networks of actors often create, defend and maintain path-dependent trajectories that reflect their interests to the detriment of societal desire. At the regime level, 'lock-in' usually occurs, whereby the regime actors, alongside their vested interests, may clash with the select few who are pro-change of the wide societal desire for a transition toward more sustainable practices (Geels, 2002; Markard et al., 2012). In many instances, efforts to unlock a well-established and resilient system by introducing an innovation of policy initiatives are often rejected by the incumbent regime actors who are comfortable with the status quo that reconciles their vested interest in the incumbent actors. However, at any given time, the regime becomes vulnerable to landscape pressure—creating windows of opportunity for niche innovations to thrive (Loorbach et al., 2017).

4.3.3 The niche innovations

This phase of the MLP represents experimentation, incubation spaces or arenas where radical innovation emerges within a system, governance or societal setting (Geels, 2011; Smith et al., 2010). Transformative changes are often triggered at the niche stage, where radical novelties can drive significant changes that may deviate from the prevailing dominant regimes' practices and are often the starting point for systemic change to shape sustainable development pathways. These radical changes may emerge at the niche level as groundbreaking environmental policy innovation, alternative technologies, novel practices, transformative ideologies, or innovative concepts. Such innovations are typically responses to the unsustainable practices entrenched in existing regimes and are spearheaded and developed by small networks of frontrunner actors,

often situated at the periphery or outside the mainstream. Consequently, safeguarding these emerging novelties becomes imperative as they may face opposition from anti-innovation or conservative actors within the established regime who seek to uphold or revert to the status quo (Smith et al., 2010; Geels, 2011). The niche level serves as an innovative fertile arena for the incubation and maturation of ideas that challenge the existing order, fostering an environment where novel solutions and approaches can gain momentum, shielded from resistance by frontrunners against the entrenched forces of conservatism within prevailing regimes.

In sum, the interconnection among the three components in the MLP can be understood as a nested hierarchy by showing that regimes are embedded within broader landscape contexts and niches operate within regimes (refer to Figure. 4.2). The activities within niches typically address the challenges posed by existing regimes. Actors actively support and contribute to the niche, anticipating that innovations emerging from it will eventually influence or supplant the prevailing regime. Niches play a crucial role in instigating systemic innovations as they serve as the embryonic arena for inducing transformative change. The emerging trends or developments in the landscape do not necessarily have an immediate impact on the niche innovations and regimes; instead, they typically “need to be perceived and translated by actors to exert influence” (Geels and Schot, 2007: p 404), whereas niche-innovations and regimes have the capacity of leading to action through sociological structuration (Geels and Schot, 2007: p. 404).

Scholarship in the field of niche innovation, as discussed by Schot and Geels (2008) and Kemp et al. (1998), identifies three fundamental processes that contribute to the development of niches:

- The clarification and modification of expectations or visions that guide innovation efforts and seek to garner attention and financial support from external stakeholders.
- Establishing social networks and including additional participants can enhance the resource pool available for niche innovations.

- The processes of learning and articulation across various dimensions, including technical design, market demand, user preferences, infrastructure needs, organizational challenges, business models, policy instruments and symbolic meanings.

Niches are likely to gain traction when expectations are articulated with greater precision and gain wider acceptance when the alignment of diverse learning processes leads to a stable configuration known as a 'dominant design' and when networks expand, particularly through the involvement of influential actors who can provide legitimacy and resources to niche innovations.

4.4 Transition Pathways (TPs)

The concept of MLP of transition theory leads to the idea of transition pathways. Geels and Schot (2007: p. 405) state that “different timings of multilevel interactions have different outcomes”. In essence, timing is critical to understanding the process, dynamics, and complexities, including the likely transition outcome. In this sense, transition pathways are "the sequence of events or timing of interventions that lead to a specific process of change, given the multiple possibilities" (Peterson et al., 2022: p. 1716). It is argued that understanding the potential pathways that a transition may take is crucial, as these pathways can vary significantly based on the interplay of policy windows, timing, and the dynamics of multi-level interactions (Geels and Schot, 2007; Loorbach, 2010). The timing of pressures arising from the landscape is particularly critical, as the success of the transition process is contingent upon the maturity of niche innovations. This aspect highlights a challenge within the MLP, which involves assessing the developmental stage or maturity of technological niches at the micro-level and determining their readiness to achieve breakthroughs at the meso- or regime-level. It is noteworthy that regime actors and niche actors may hold differing views regarding the maturity of these innovations.

Moreover, the nature of the interactions between landscape pressures, niche innovations, and the prevailing regime is vital for comprehending the transition process. It is posited that landscape developments that reinforce the stability of the existing

regime do not serve as catalysts for transitions (Geels and Schot, 2007). In contrast, disruptive landscape changes act as a catalyst for transformation at the regime level. Regarding niche innovations, their relationship with the existing regime can be characterized as competitive when they seek to supplant it or symbiotic when introduced as enhancements to the current regime (Geels and Schot, 2007). Geels and Schot (2007) have proposed various transition pathways that can be summarized based on the nature and intensity of the relationships between niche innovations and landscape developments in relation to existing regimes. These include the following:

- Substitution pathway: This is a transition pathway where exogenous landscape influences exert significant pressure on the dominant regime and niche innovations become mature enough to displace the status quo of deficient system, practice or policy approach. The resulting system or regime diverges from its predecessor in operational methodology and its actor's composition.
- Transformation pathway: This is a transition pathway in which landscape pressure may persist, but there is an absence of matured niche solutions to replace the existing regime system practice or policy approach. Within this pathway, the dominant regime actors may be able to adapt and refine their strategies to align with the evolving perception and demands of new conditions or innovative ideas.
- Re-configuration pathway: This is a transition pathway in which landscape pressure compels the dominant regime to mainstream new policy solutions or innovative ideas emanating from the niche environments. Over time, this process may lead to a transformation in the operational logic of the dominant regime.
- De-alignment and re-alignment pathway: This transition pathway represents wherein significant landscape influences destabilise the dominant system practice or policy approach. At the niche level, no definitive alternatives could replace the existing regime. Multiple potential niche solutions vie for prominence until a new regime coalesces around one of these alternatives.

- **Reproduction pathway:** This is a transition pathway in which no intense landscape pressure exists on a given system or regime and where change is incremental and follows internal regime logic.
- **Multi-pathways:** This transition path may adopt any of the development trajectories identified above, contingent upon the way and timing of the response from regime actors to landscape pressures.

4.5 Transition Management (TM)

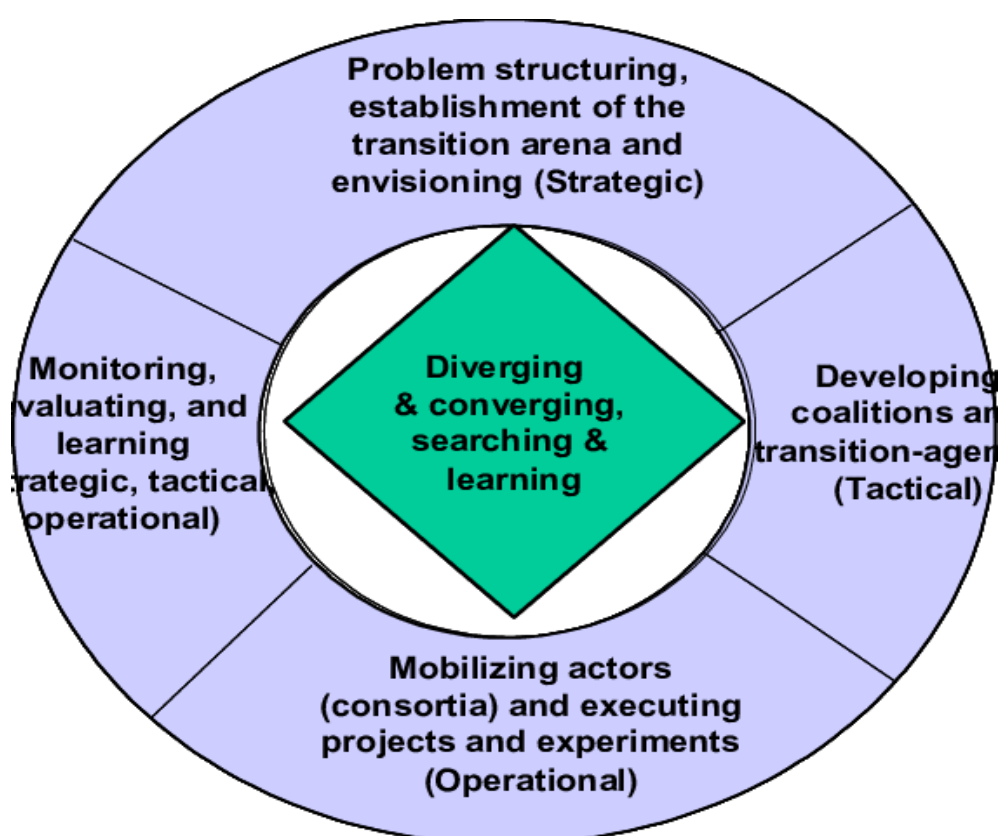
The third concept of transition theory is centred on governing and guiding the transition, referred to as Transition management. Transition management is a process-centric management principle that is grounded in disciplines such as multi-level governance and adaptive management (Rotmans et al., 2000). TM is also known as the transition governance approach. This governance approach is based on steering multi-actor processes at various levels in order to shape long-term sustainability development by co-creating a problem, developing a long-term vision, establishing innovation networks, and creating experimental environments. TM by definition, is seen as an anticipatory and adaptive governance mechanism because the scope and multi-dimensional complexities of transitions that involve multi-actors and varied interests and values cannot be managed through a command and control approach (Smith and Stirling, 2008; Loorbach, 2010; Kemp et al., 2007). Therefore, as an alternative to the traditional command and control governance approach, TM can promote the shared vision to steer a sustainable transition toward more sustainable pathways by transforming the dominant unsustainable systems into a more desirable outcome. In other words, the evolving trend and need to foster a more sustainable transition is beyond the capacity and remit of the traditional planning based on command and control thinking; however, the direction and pathways of such a transition can be shaped and steered through the TM process-oriented approach.

The key underlying rationale for the management of transitions is that many past historical attempts to initiate a wide range of transitions in diverse sectoral developments in many jurisdictions around the world did not lead to a more sustainable

society. Instead, the adverse environmental consequences of such transitions often surpass any positive outcomes. Therefore, facilitating a transition with the predetermined aim of achieving sustainability—which is inherently rooted in subjective perspectives and shared vision—should ideally be guided by a multi-actor based on a consultative and participatory process that includes a diverse and balanced array of stakeholders. Therefore, unlike traditional management approaches, TM operates on the philosophical underpinning that downplays the idea of assuming absolute control and management of societal transition but places emphasis on collaborative management processes to steer, moderate, and accelerate transformative changes along sustainable pathways based on searching and learning process, adjusting and adapting and experimentation between networks of stakeholders. In this respect, TM does not fixate on a predetermined solution as the ultimate outcome; rather, it adopts a process-oriented, explorative, and design-centric approach to redirect the choices of actors towards sustainability (Loorbach, 2007). This typically involves framing shared visions and goals, promoting change through transition experiments, and learning and assessing the pace of progress of these experiments (Kemp, 2003; Loorbach, 2007; Loorbach and Rotmans, 2005).

Transition management is often linked to four key cyclical and iterative activities: (1) the reframing of the problem and development of a transition arena, (2) the establishment of transition long-term shared vision, transition pathways and agendas, (3) a steering process based on knowledge-creation and learning brokerage and (4) monitoring and evaluating the transition process (See Figure 4.3). The following subsections briefly discuss the process of transition management.

Figure 4.3: Transition management framework



Source: adapted from Loorbach (2010)

4.5.1 Reframing the problem

As illustrated in Figure 4.3 above, problem structuring and envisioning represent a pivotal phase in transition management, wherein consensus is cultivated within the transition arena to engage in discussions regarding societal challenges and formulate potential solutions. During this phase, transition management emphasizes the importance of transformative discursive changes in governance, recognizing and addressing enduring societal issues while translating them into innovative future strategies and interventions. Van Buuren and Loorbach (2009) highlighted that the involvement of diverse actors in problem structuring should reflect a wide array of backgrounds, competencies, values, interests, and perceptions. By acknowledging stakeholders' varied values and power dynamics, the transition arena can promote a consultative and participatory approach to redefining problems (Smith and Stirling, 2008). Such participatory processes encourage the development of new shared perspectives and dialogues, enabling the creation of

coherent and persuasive representations of the issues at hand (Rotmans et al., 2001; Scholz et al., 2009; Loorbach, 2010; Hisschemoller et al., 2001). Consequently, a key element of transition governance is cultivating shared and deep insights alongside acknowledging the need for transformative systemic change. This methodology enhances actors' understanding of complex societal challenges by integrating innovative thinking to address the symptoms of persistent societal issues, path dependencies, lock-ins, power dynamics, and detrimental interactions between niche and regime levels (Smith and Gurin, 2010).

4.5.2 Developing transition vision and pathways

As highlighted by Sondejker et al. (2006) and Quist and Vergragt (2006), the fundamental factors driving radical innovations and governance experimentation stem from a collective understanding among stakeholders regarding the necessity and potential for creating a viable alternative future, as well as the core objectives, values, and goals they aspire to achieve (See Figure 4.3). The formulation of a vision for future development, along with a transition agenda that delineates the pathways for change, is regarded as qualitative in nature. As noted by Loorbach et al. (2017), this approach embraces multi-dimensional and pluralistic perspectives and values. Transition governance utilizes critical methodologies such as envisioning alternative systems, backcasting, and constructing future scenarios. These tools facilitate strategic engagement among actors and networks, allowing them to explore radical innovation pathways and devise feasible and reasonable alternative goals and agendas. Nevertheless, transition scholars, including Smith and Stirling (2008) and Rotmans et al. (2001), caution that while creating visions is instrumental in providing direction, the advantages of such visions should not be overstated. This is due to numerous competing visions, uncertainties, and unforeseen events that may overshadow the preferred outcomes. Consequently, in the context of transition governance, the function of vision is primarily focused on motivating, coordinating, empowering and guiding strategic initiatives or actions in both the short and medium term, as articulated by Nevens et al. (2013).

4.5.3 Developing transition experiments

The transition process is inherently characterized by complexities, nonlinearity, and uncertainties. Consequently, a learning-by-doing and doing-by-learning approach is the most effective strategy for adapting, evolving and fundamentally transforming the prevailing governance culture, institutions or practices (Loorbach et al., 2017). At this juncture, transitional management emphasises developing a comprehensive array of interconnected transition experiments. These experiments should be strategically crafted to enhance and support one another, thereby making significant contributions toward the attainment of the desired transition goals. Establishing clear criteria for selecting these experiments is essential to ensure a coherent and interconnected framework that promotes synergy and collaboration among various stakeholders. This interconnectedness is vital for achieving collective impact and successfully driving transformative changes within the socio-political context. Raven et al. (2007) highlight the importance of engaging a network of actors in the transition arena to effectively develop and implement transition experiments. The active involvement of frontrunners in the transition process is crucial, as their insights and expertise play a significant role in the success of these initiatives (See Figure 4.3). Creating a platform that fosters broad acceptance of transition experiments and the associated learning processes among relevant stakeholders is imperative. Thus, experimentation serves as a means to navigate complexity and gather evidence regarding the new relationships and roles essential for facilitating the transition.

4.5.4 Learning and evaluating

Achieving a successful transition necessitates a comprehensive assessment of the physical alterations within the governance framework, the gradual progression of macro-level trends, and the swift transformations occurring within specific niches—these niches represent the essential foundational space for change. Consequently, this also encompasses the shifts in both individual and collective actors operating at the regime level (Loorbach, 2010; Smith and Gurin, 2010; Loorbach et al., 2017). The evaluation of transition management encompasses several critical dimensions, including:

- It is essential to monitor the actors engaged in the transition arena, focusing on their habits, thought processes, behaviours, responsibilities, networking efforts, collaborative endeavours, and alliances, as well as their activities, utilization of tools and ongoing projects.

- The transition agenda must be assessed in relation to the established goals, actions, projects, and instruments. Additionally, transition experiments should be evaluated based on the new knowledge generated and the potential for its transferability among the actors while also considering elements of social and institutional learning.

- The transition process itself warrants careful observation, emphasizing the rate of advancement, identifying obstacles, highlighting areas for enhancement, and recognizing other pertinent factors. The integration of monitoring and evaluation throughout each phase and at every level of transition management can promote social learning by fostering interaction and collaboration among the diverse actors involved.

Thus, transition governance highlights the significance of ongoing learning, adaptation, and experimentation. A systematic and continuous approach to monitoring and evaluation can facilitate reflective analysis of how deliberate actions intersect with broader societal transition dynamics and vice versa. By concentrating on dynamics and processes rather than solely on implementation, by-products, or outputs, systematic reflections can aid in reorienting transitions and uncovering new opportunities (Voß et al., 2009).

4.6 Principles of transition theory

A comprehensive examination of various transition principles found within the academic literature (Loorbach et al., 2017) is essential for understanding the potential outcomes of a transition process in any given system. For this research, particular emphasis is placed on the following fundamental principles of transition theory.

4.6.1 Co-evolution

Transition scholars assert that a transition is a co-evolutionary process marked by dynamism, complexity, and multi-domain interactions (Geels, 2005a). This concept is rooted in the idea that co-evolution occurs when various layers of human development evolve together and mutually reinforce one another. Consequently, a non-linear and multi-level perspective on transitions necessitates an understanding of the diverse elements involved in complex system changes and their interrelations. This typically requires a focus on the evolving interactions among the technological, social, economic, ecological and institutional dimensions of society to comprehend the nature of the transition in question. As highlighted by Loorbach et al. (2017), when examining the potential for a transition in governance or policy frameworks, it is imperative to engage in deeper analysis that transcends linear causality. This approach involves moving beyond inquiries about which factors precede others or what initiates certain causes; instead, transition analysis must recognize how various phenomena are shaped, coexist, and interconnect in a non-linear fashion. Therefore, in order to explore the prospects of a transition from project-level assessment to a strategic-level approach in Nigeria's oil and gas environmental management regime, it is crucial to adopt a co-evolutionary perspective of MLP of transition theory that acknowledges the multi-dimensional interplay of three analytical levels – landscape influence, regime and niche innovation interacting within a nested hierarchy.

4.6.2 Multi-actor and networks

Transition scholars such as Gurin et al. (2011) and Avelino and Wittmayer (2016) emphasize that transitions involve a multitude of actors from various sectors, including government, market, knowledge institutions and civil society organizations. They highlight that the dynamics of power and the distribution of roles among these diverse actors are intrinsic to any transition process. It is essential to acknowledge that some actors may have stronger ties to established regimes and conventional practices than others, while certain individuals may exhibit greater adaptability in aligning with niche innovations or alternative regimes. This observation raises concerns about power imbalances and the varying degrees of influence among different actors (Loorbach et al., 2017). Therefore, a critical aspect of any transition is the need to understand how various forms of agency influence the direction and speed of transitions and how these actors

can be effectively engaged and supported to facilitate the desired transformative changes. This often entails a call for institutional reorientation and the involvement of innovative frontrunners from outside the established systems, alongside the inclusion of marginalized groups. Thus, to examine the prospects of a transition from project-level assessment to a strategic-level approach in Nigeria's oil and gas environmental management regime, it is imperative to identify and consider the role of different types and forms of agency in transition is crucial.

4.6.3 Institutional density and structure

Institutions represent social frameworks that encompass formal governance structures, established policies and regulations, as well as implicit codes of conduct, behavioural norms, and cultural practices, all of which significantly influence societal interactions (North, 1990). Nevertheless, various challenges frequently arise when attempting to implement transition visions and pathways, particularly difficulties in execution, which are largely shaped by the density and structure of these institutions (Geels, 2005) (Loorbach; Frantzeskaki and Avelino, 2017). This situation arises because institutional arrangements often lack the collaboration and cooperation necessary to tackle persistent societal issues that require collective action benefiting all stakeholders. Instead, these arrangements emerge from power dynamics rooted in a top-down command-and-control model of political authority, where influential actor coalitions wield considerable resources that shape the institutional decision-making landscape. Such institutional density tends to create a rigid decision-making environment characterized by value conflicts, as not all participants possess equal influence or involvement in the decision-making process. Mendez et al. (2019) highlighted the concept of the rigidity trap, wherein institutional regimes that favour command-and-control governance often struggle to achieve a balance between economic growth and environmental sustainability. This type of institutional density and configuration prioritizes power and financial interests to such an extent that it leads to suboptimal outcomes, ultimately jeopardizing environmental integrity. Consequently, the existing institutions, norms, and established actors that justify unsustainable practices can hinder or obstruct the emergence of innovative solutions essential for driving transformative change.

Achieving a sustainable transition necessitates effective coordination and communication among various stakeholders within institutional and administrative decision-making frameworks. This can be accomplished by establishing inclusive communication channels that prioritize consultative and participatory planning. To gain insight into the institutional facilitators and barriers that influence the prospects of a transition from project-level assessment to a strategic-level approach, it is essential to apply the MLP of transition theory. The MLP framework highlights the significance of actors and elucidates the dynamics of their interactions within institutional contexts (Loorbach et al., 2017).

4.6.4 Path-dependencies and lock-ins

Transition theory notes that the key challenges militating against the prospects of a transition to a more sustainable future are the existence of path-dependencies and lock-ins in the governance and institutional regime that frame policies and strategies (Loorbach et al., 2017; Verbong and Geels, 2007). According to Hanger-Kopp et al. (2022: p. 2), path dependency is a “process that has the property of staying on a particular path so that past decisions and contingent events pre-determine what further steps may be taken”. Under such conditions, a culture of decision-making, well-established norms, practice and technological systems become locked-in self-reinforcing mechanisms that stifle innovative solutions. Path dependencies often occur when actor coalitions with enormous political authority and resources create and maintain a path that reconciles with their vested interest. Path-dependent trajectories often manifest as a stiff resistance to transformative changes from the prevailing and dominant approach to decision-making, institutional culture, and even technological systems, which may seem to be maladaptive (Foxon, 2011; Elzen et al., 2004; Haan and Rotmans, 2018). An attempt to disentangle and change the path-dependent trajectories of decision-making by the innovative-oriented actors within and outside the regime may face considerable pushback from the incumbent actors and thus lead to a state of lock-in. Thus, the key to the transition goal is identifying, understanding and assessing why it is difficult to facilitate a transition from an unsustainable institutional and governance regime of policy production to a more sustainable approach, including how path dependency can be

overcome.

4.6.5 Window of opportunity (w/o)

Transition theory posits that a confluence of various factors—such as external pressures, internal momentum generated by niche innovations, and the gradual destabilization of the prevailing regime—can create a critical window of opportunity for initiating a transition. This window, often termed a margin of opportunity or critical decision window, signifies a timeframe during which the likelihood of successfully transitioning from an unsustainable system to a more sustainable one is significantly enhanced (Loorbach et al., 2017; Gelcich et al., 2010). It is contended that once this decision window has passed or closed, the potential for achieving such a transition may diminish considerably. Transition theory emphasizes the necessity of capitalizing on these opportunities when they arise, as they are crucial for transforming systems that have become entrenched in unsustainable practices. Thus, in order to explore the prospects of a transition from project-level assessment to a strategic-level approach in Nigeria's oil and gas environmental management, an analytical framework that advanced the notion and significance of targeting a key decision window to initiate a transition appears appealing and critical.

4.6.6 Learning

A shift towards a more sustainable framework at the systemic, technological, and societal levels is frequently characterized as a process of experiential learning and practical application (Loorbach et al., 2007). Achieving collective benefits and transforming perspectives, practices and innovative strategies necessitates the collaborative design of knowledge brokerage among critical actors and stakeholders. The effective utilization of knowledge can enhance the potential for innovative solutions within specific niches and may significantly influence the broader regime. Consequently, learning emerges as a crucial element for disseminating and advancing innovations, practices and experiments within these niches. At the core of transition theory lies the development, sharing and accumulation of knowledge within these niches, which is essential for establishing shared visions and strategic plans. The clear expression of expectations or visions serves as a crucial framework for guiding innovation efforts while

simultaneously attracting interest and financial support from external stakeholders. This process can facilitate the development of social networks and engage a wider array of participants, thereby enhancing the resource pool available for niche innovations. Consequently, the processes of learning and articulation are likely to encompass multiple dimensions, including technical design, market demand, user preferences, infrastructure needs, organizational challenges, business models, policy instruments, and symbolic interpretations. Niches tend to gain traction when expectations are articulated with greater precision and receive broader acceptance. This occurs when the alignment of diverse learning processes leads to a stable configuration, often referred to as a 'dominant design,' and when networks expand, particularly through the involvement of influential actors who can lend legitimacy and resources to niche innovations.

In light of the foregoing, the MLP of transition theory posits that as the previously dominant paradigms of thought, approaches and practices become inadequate in addressing sustainability challenges, a pressing need arises to cultivate new perspectives, competencies and innovations. This transformation can occur within socially constructed spaces where prevailing norms, values and institutions can be reformed to effectively tackle sustainability issues (Paredis, 2013; Kemp et al., 1998; Geels, 2004).

4.7 Critiques and limitations of the MLP of transition theory

Although this study adopts the MLP of transition theory because of its robustness and applicability to this research, which aims to explore the prospects of a transition from project-level assessment to a strategic approach in Nigeria's oil and gas environmental management regime, it is not without its criticisms or shortcomings. The MLP conceptualizes transitions as non-linear processes emerging from the dynamic interaction across three analytical levels: landscape, regime and niche development. The landscape, an exogenous factor, encompasses broader structural conditions that influence regimes and niches, while regimes represent the locus of established practices and the rules that stabilize existing systems and niches are viewed as the breeding ground for radical innovations (Geels, 2002; Rip and Kemp, 1998; Geels, 2005a). Each level is characterized by a distinct configuration of elements, with higher levels exhibiting more stability than lower levels due to a larger number of actors and stronger alignment

between the elements. Markard and Truffer (2008: p. 605) critique the regime concept, which sometimes inconsistently refers to 'rules' and serves as a shorthand for 'system' in others. They find the conceptual distinction between system and regime to be “not convincing” and advocate for enhanced “conceptual rigour in the identification and delineation of a regime” (p. 606). Furthermore, Berkhout et al. (2004, p. 54) argue that “it is unclear how these conceptual levels should be applied empirically.” The criticisms directed at the regime level in previous case studies stem from the lack of systematic identification, which is attributed to the MLP's insufficient robustness concerning a regime and the identification of actors within those regimes (Genus and Coles, 2008).

In view of the above, scholars such as Markard and Truffer (2008) and Smith et al. (2005) argue that the MLP framework is often overly descriptive, which can lead to discrepancies in interpretation. Smith et al. (2005) further emphasize that the MLP requires more explicit conceptual tools to provide a more systematic and structured framework. Similarly, Markard and Truffer (2008) argue that the MLP could be made more explicit through more unambiguous identification and definition of inter-level relationships. In support of these critiques, Genus and Coles (2008) suggest that the lack of well-defined boundaries within the MLP framework often requires interpretive creativity, which can lead to inconsistent applications and identifications across studies. This lack of consistency in applying the MLP may contribute to variations in research outcomes (Genus and Coles, 2008). However, Smith et al. (2010) contend that theoretical sensitivity is crucial for researchers as they navigate the identification of mechanisms, patterns and relationships within the context of transition theory, especially when employing the MLP in empirical studies.

A notable limitation of the MLP in transition theory is its predominant application in developed countries of the Global North, with limited use in emerging economies of the Global South, such as Nigeria. To address this gap, this study applies the MLP framework to explore how a transition from project-level assessment to a strategic approach could unfold within the oil and gas environmental management regime of an emerging economy like Nigeria. Additionally, there are concerns regarding the operationalization and specification of regimes. While the MLP generally conceptualizes transitions as non-

linear processes, it often underscores that a transition signifies a development, shift, or evolution from one form, phase, or style to another (Geels, 2004; Geels and Schot, 2007; 2010). Accordingly, this study focused on continuous forward and backward transitions. It aims to illustrate a transition from an EIA to an SEA regime that does not involve discarding the current EIA regulatory approach for project-level assessments. Thus, the transition theorised and discussed in this research represents not just a shift in environmental management processes but also a broader transformation in ideas, thinking, cognitive perspectives and practices. Furthermore, the learning process embedded in the transition-based model in this thesis is intended to occur through continuous loops of reflection and knowledge generation along the EIA-SEA spectrum. In other words, the learning process could impact the transition to SEA, and in turn, the outcomes of that transition could influence decisions and actions made within the existing EIA regime.

4.8 Synthesis of the MLP of transition theory and link to research objectives

The following sections evaluate and synthesise the relevance of MLP of transition theory in the preceding sections in relation to the overall aim of the study. It also provide the structure for the thesis and guide the research's process and design of the research (See Figure 4.4: Conceptual framework). In particular, the MLP frames the researcher's thinking about the prospects of a transition from project-level assessment to a strategic-level approach in Nigeria's oil and gas sector, including actors and networks, institutional arrangements and politics and power dynamics, and the challenges posed by path-dependencies and lock-ins within environmental management regime.

4.8.1 Rationale and applicability for adopting MLP of transition theory

Complex and persistent societal challenges, particularly environmental and sustainability issues associated with the activities of intensive energy industries such as oil and gas, are defining a new agenda for environmental management in many jurisdictions around the world. This has led to considerable interest in the transition toward an innovative environmental policy instrument that can operationalise sustainability principles in energy policy and planning initiatives to achieve better environmental protection and management as opposed to relying on traditional forms of environmental regulation

(Fidler and Noble, 2012; Caddell, 2016; Vilardo et al., 2020). However, a critical contention is that a transition toward an innovative environmental policy instrument is constrained by the entrenched system that is characterised by the path-dependent practice that has often become locked-in (Loorbach et al., 2017). Path-dependency and lock-in manifest in two ways: first, when society or decision-makers build cognitive perceptions, habits, assumptions, culture and practice that are regarded as indispensable for addressing complex and persistent societal challenges, and second, when the prospects of integrating a new innovative approach, practice or strategy are resisted by the prevailing system (Geels and Schot, 2007; Geels, 2002). This lock-in effect makes it difficult to promote or implement new innovative approaches, as regime actors, along with the entrenched formal and informal institutional characteristics that perpetuate traditional approaches often work to disrupt or neutralize the prospects of such transformative shift (Geels, 2002). It is posited that a transition from the traditional path-dependent practice toward a more innovative-oriented approach to achieve a more sustainable future within the incumbent and resilient system often occurs when mutually reinforcing trends and developments align across various levels. It is through the interplay of the countervailing and dependent trends and developments operating at different levels of the system that a more sustainable future can be realised within the incumbent and resilient governance structures (Loorbach et al., 2017; Markard et al., 2012; Geels et al., 2017).

In contextualising the prospect of transitioning from project-level assessment to a strategic approach in Nigeria's oil and gas environmental governance regime, it appears that such a shift will be driven by a complex interplay of co-evolving factors and trends and the way in which they interact with each other within or at the fringe of the existing system. Hence, the use of MLP serves as a valuable analytical framework that can provide insights into how such a dialectic interaction of transition processes could unfold to make sense of the prospects of a shift from the traditional project-level assessment to a more innovative strategic approach in Nigeria. In essence, the use of MLP of transition theory can shed light on the current oil and gas environmental management regime that is being characterised by the dominant EIA practice, incumbent actors and the shared cognitive beliefs and assumptions which appear to maintain the status quo of environmental

improvement of individual project development rather than changing the traditional approach. It can also help to illuminate how the regime actors may resist or succumb to the pressure from emergent events or factors that could enable a diffusion within the environmental management regime toward a strategic approach to planning and impact assessment in the oil and gas sector. These insights are crucial since the actors operate within the existing EIA regime, and their acceptance or resistance to facilitate a transition toward the SEA process in the oil and gas sector can significantly determine, to a large extent, the prospects or otherwise of the adoption of SEA. In essence, the MLP can enable mapping of the actors' responses to understand how they align or misalign with the broader emergent societal complex issues, which are vital in potentially destabilising the stability of the prevailing regime of EIA practice while targeting the policy window provided by the PIA which outlines an ambitious plan to expand oil and gas development into new frontier basin fields that possess significant hydrocarbon resource potential to facilitate a shift SEA in Nigeria.

Furthermore, the use of MLP serves as a valuable framework that can provide insights into potential landscape pressures that could trigger a shift from project-level assessment toward SEA in Nigeria's oil and gas environmental management. The landscape comprises slow-changing trends such as ideology or social values, worldviews, paradigms and shock exogenous influences or game-changing trends such as macro economy, environmental degradation, sustainability challenges and climate change concerns (Geels et al., 2017; Geels, 2004). These landscape influences constitute core societal problems or concerns with considerable importance and weight to unlock perceived path-dependencies and lock-ins in a particular regime or system, hampering necessary transitions to a more sustainable approach or even a desired future (Markard et., 2012). Arguably, given the centrality to the now generally accepted overwhelming consensus that sustainability challenges and climate change concerns are defining a new agenda for environmental management, whether in the search for more sustainable policy instruments or in the expectation of improved environmental performance by industrial energy operators, the current decisions about oil and gas decision and management of the impacts associated with such development which are still predominantly locked-in in EIA path-dependent practice may likely succumb to a specific

or a range of landscape influence or game-changing events or conditions referenced above. In other words, recognizing the imperative of global issues could encourage regulatory authorities to adopt a higher and earlier level of environmental assessment by which the environmental consequences of oil and gas PPP development initiatives are considered early in the planning process before individual projects are conceived, thereby creating a context for projects to be drawn up in line with strategies that have already been environment-proofed.

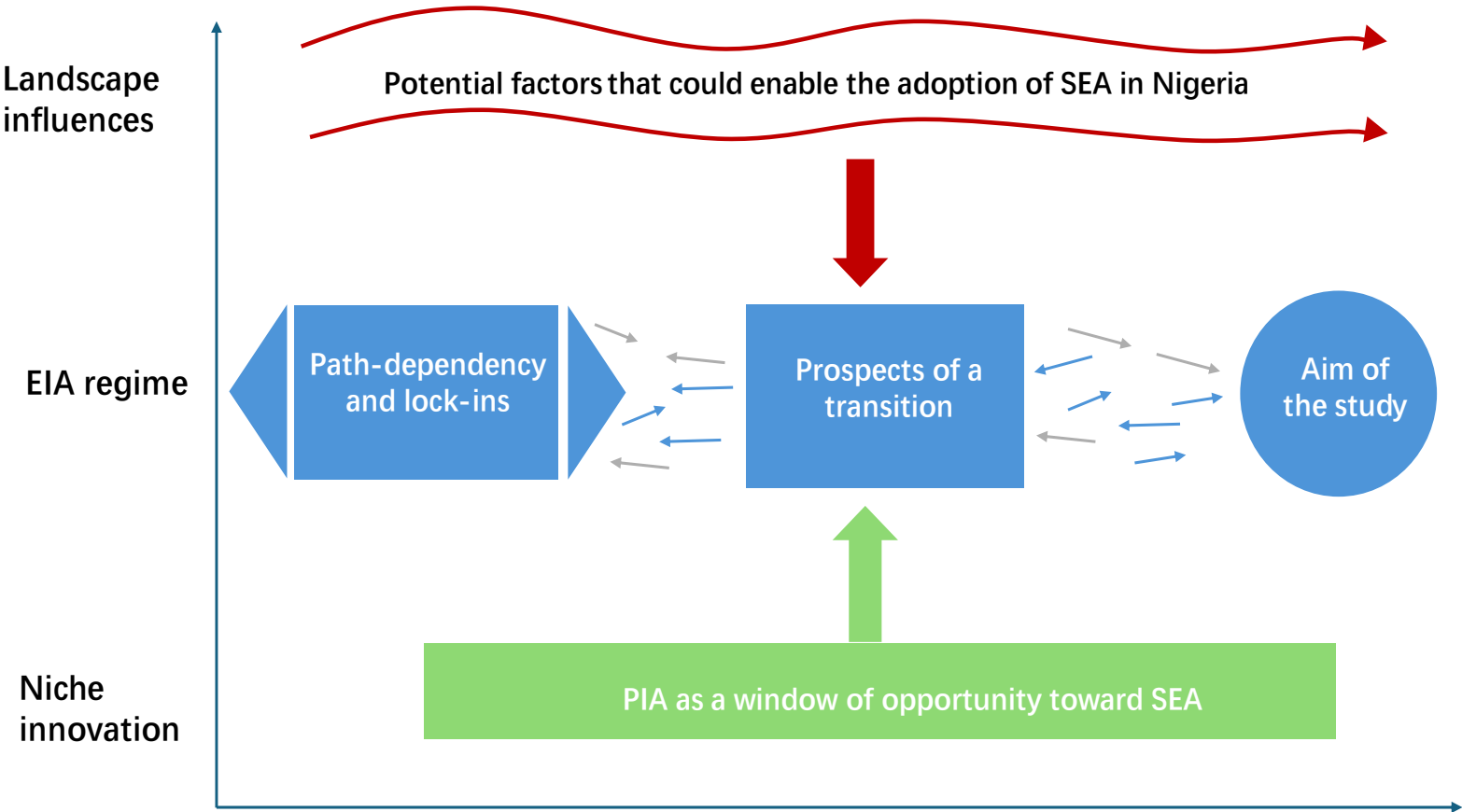
Moreover, the use of the MLP framework could enable the recognition of niche opportunity in which innovations may emerge — ones that may significantly deviate from incumbent environmental management practice to set the stage for the potential shift toward the SEA process. This research theorised that the need and opportunity for a transition from the prevailing project-level assessment to a strategic approach in Nigeria is more important now than ever, given the recent enactment of the Petroleum Industry Act, which outlines an ambitious plan to expand oil and gas development into new frontier basin fields that possess significant hydrocarbon resource potential. Core to the postulation advance in this study is that a key decision window or moment such as PIA should be targeted as a niche opportunity to adopt SEA in the context of oil and gas planning and development in Nigeria. Thus, the PIA could be a fertile ground and incubation space to advance a systemic change in environmental management toward SEA. The policy window provided by the PIA indicates optimistic prospects for an improved oil and gas development assessment and decision-making, particularly in the new frontiers, where hydrocarbon development is on the horizon. However, it is imperative to note that while the PIA presents a policy window for environmental policy reconfiguration, it may not be sufficient for the effective diffusion of the EIA regime to adopt SEA unless it is supported by the regime actors and shielded to the point of maturity to become embedded within the prevailing environmental management practice. As Geels (2012) pointed out, novel ideas emerge in the niche when there is a protective environment in the form of R&D laboratories.

Accordingly, the acceleration phase of niche development requires the active involvement of regime actors who hold complementary assets and exert significant

influence in the policy arena (Elzen et al., 2012). In terms of regime actors, the research also operationalises the role of incumbent regime actors and how their relationships with the niche actors shaped the transition toward the adoption of SEA in Nigeria. The niche is connected to the regime as it needs to be embedded in it by building up internal momentum within the niche to create a shift or potential adoption of novel ideas within the regime (Geels, 2012). The niche actors are purveyors of innovations that may likely trigger a departure from the accepted norm or standard that is embedded in the existing regime (Geels et al., 2012; Hoogma et al., 2002). In particular, in many cases, the imperative of embracing a more innovative approach to address emerging societal complex challenges at the landscape level is promoted by niche actors that may not necessarily come from within the regime. This further indicates that actors outside of the environmental management regime will likely promote the prospect of a transition toward SEA in Nigeria's oil and gas sector. This means that the prospect of a transition toward SEA is determined by the scope of a broader network of interactions between the key regime and niche actors. Thus, transition theory can play a key role in unravelling how collaboration and engagement among these diverse actors will unfold and how it can help induce a policy-learning process across the multiple dimensions of both niches and regimes to overcome potential bottlenecks and thus the longer-term viability of a transition toward the SEA approach.

In view of the foregoing, the MLP perspective served as a guide to the design of the interview question used in gathering empirical research for this research. In particular, it enabled critical investigations that will result in understanding the current EIA practice, which has been used as a management response to environmental risks posed by hydrocarbon extraction and production in the Niger Delta region. The EIA strengths and limitations of the EIA practice. The perceived critical landscape pressure for strategic transition and the insights into the niche opportunity provided by the policy window—that's PIA. Emerging out of these insights is the design of the conceptual framework that underpinned this research, as illustrated in Figure 4.4 below:

Figure 4.4. The research conceptual framework



Source: Author generated

Miles and Huberman (1994: p. 18) defined a conceptual framework as a visual or written product, one that explains, either graphically or in narrative form, the main things to be studied—the key factors, concepts or variables—and the presumed relationships among them. Accordingly, the primary objective of the conceptual framework in this study is to establish a coherent and explicit linkage between the literature review detailed in Chapters Two and Three—with a particular emphasis on the multi-level perspective of the transition management frameworks. This framework also incorporates the rationale of the study as outlined in Chapter One of this research, culminating in a prospective conceptual idea. The framework serves as a foundation for guiding the research process and ensuring that the key elements of the study are aligned. Importantly, the conceptual framework is designed to provide direction on how the overarching aim of the research will be accomplished, integrating the various theoretical insights and practical considerations to shape the methodological design for data collection and analysis. By drawing from the insights of transition theory and employing the MLP as a guiding lens, the framework offers a structured approach to exploring the prospects of a transition from project-level assessment to a strategic-level approach in Nigeria's oil and gas environmental management regime. This choice of theoretical framework is well-suited for identifying critical decision factors that could inform such a transition, including the potential barriers.

4.9 Chapter Summary

This chapter describes the transition theory and frameworks that shape the theoretical underpinning of this study. It provides a comprehensive review of key concepts and approaches within the transition theory literature, offering insights into the relevance of multi-phase transitions, multi-level perspectives and the transition management approach. The chapter also emphasizes the core principles of transition theory, demonstrating how they are essential to achieving the overall aim of this research. The review justifies the adoption of transition theory, specifically MLP, which posits that transitions emerge from dynamic interactions between three analytical levels: regimes (the entrenched practices), landscape pressures (broader contextual forces), and niches (spaces for radical innovation) (Geels, 2002; Geels et al., 2017). Within this context, the

MLP analytical framework fits together for the context of this research and has been used to address the research objectives, as illustrated in the preceding sections of this chapter. The insights from the MLP principles may enable an understanding of how the trajectory of the current project-based EIA approach in Nigeria's oil and gas environmental management regime could strategically shift toward the SEA approach.

The subsequent chapter outlines the research methodology employed in this study, detailing the data collection methods, identifying the sources of data, and explaining the procedures utilized for data analysis.

CHAPTER FIVE

Research Design and Methodology

5.1 Introduction

This chapter presents the research design and methods that have been employed to explore the prospects of a transition from project-level assessment to a strategic-level approach in Nigeria's oil and gas sector. It begins with a description of the research paradigm underpinning this research, followed by a justification for the mixed-methods approach and the key factors that influenced the selection of a case study strategy. The chapter then elaborates on the rationale for the sample size, data gathering techniques, data collection procedures, and the methods used for data analysis and interpretation. Finally, it highlights the ethical considerations adhered to in relation to the research methods employed.

5.2 Research philosophy

Research philosophy is "a basic set of beliefs that guide action" (Guba, 1990: p. 17). The research philosophy guides the phenomenon being studied based on the researcher's beliefs and views derived from the world, referred to as the research paradigm (Saunders et al., 2009). This underscores the significance of the philosophical paradigm, which typically encapsulates the researcher's stance, underlying assumptions, the broader perspective of the world and the essence and nature of reality and truth. It is argued that understanding these facets of philosophical elements is critical to shaping and influencing the overall research framework. James and Vinnicombe (2002) and Saunders (2007) argue that understanding the philosophical underpinnings is essential in conducting research. These scholars further note that the philosophical paradigm acts as a linchpin, providing a foundational justification for selecting research design and methods to achieve the aim of the study at stake.

Research philosophical paradigms are commonly classified into ontology, epistemology, and axiology (Saunders et al., 2009). Although these paradigms share common assumptions in scholarly literature, there is no consensus on their categorization due to their overlapping and evolving nature. Various philosophical scholars have distinctively

introduced, described and categorized these paradigms in the scholarship literature. For example, Ritchie and Lewis (2003) describe ontological perspectives such as materialism, realism, critical realism, relativism, and idealism. In contrast, Saunders et al. (2009) argue that ontology encompasses positivism, interpretivism, realism and pragmatism when examined through ontological, epistemological and axiological lenses. Guba and Lincoln (1989) offer an overlapping categorization, linking positivism, post-positivism and constructivism to critical realism. Despite the lack of distinct boundaries, these paradigms collectively share foundational assumptions, positioning them as broader philosophical approaches that can be used independently or in combination in research. While they align under overarching philosophies due to shared principles, they differ in their emphasis on the implications of those assumptions. Therefore, although the philosophical paradigms of research aim to explain methodological differences, their categorization and classification methods vary significantly (Mkansi and Acheampong, 2012).

5.2. Philosophical assumptions

5.2.1 Ontology

The term "ontology" was coined in 1613 by Rodolf Gockel and Jacob Lorhard, originating from the Greek words "onto" and "logia," meaning the study, knowledge and theory of being. It is defined as a branch of philosophy concerned with the nature and structure of the world; ontology explores the existence and characteristics of entities. Rooted in metaphysics, it prompts questions about the nature of the world, the existence of objects, and the researcher's approach to unravelling and investigating these aspects. Ontological assumptions give rise to various perspectives on reality, with a fundamental dichotomy between realist (objectivist) and relativist (subjectivist) orientations. For instance, the realist or positivist central argumentative line of reasoning is the notion of the existence of an independent, objective reality beyond human perception rooted in absolute objectivism. They contend that social actors are disconnected from this reality, which comprises pre-existing, immutable structures. Realist ontology aligns with a natural science approach, emphasizing discovering objects and phenomena to deduce the overall reality based on fragmentary evidence (Denzin and Lincoln, 2005).

According to Creswell (2014), the positivist paradigm is commonly associated with natural sciences, emphasizing the systematic and objective uncovering of facts (Myers, 2019; Saunders, 2009). This paradigm enables a scientific approach, employing quantification to enhance accuracy in describing variables and their correlations. Positivist researchers, embodying an anti-subjectivist perspective — often seek to test and verify theories through empirical, generalizable and valid approaches devoid of social perceptions, attitudes, cultural backgrounds, and norms (Crotty, 1998; Guba and Lincoln, 2005; Easterby-Smith et al., 2008; 2012). Conversely, relativists adopt a subjectivist stance, viewing reality as a product of subjective experiences and perceptions. They assert that nothing exists independently outside human perception, emphasizing the socially constructed nature of reality. Likewise, relativist ontology recognizes multiple interpretations and experiences, suggesting a plurality of realities shaped by individual perceptions. In contrast to the realist motto "seeing is believing," the relativist perspective asserts that "believing dictates what is seen." In sum, the ontological discourse revolves around the researcher's stance on the essence, existence and nature of reality, with realists emphasizing an objective, independent reality and relativists highlighting the subjective, socially constructed nature of reality (Pratt 1998: p. 208).

5.2.2 Epistemology

Epistemology, rooted in the ancient Greek term "episteme", denoting knowledge, is crucial for understanding how we come to know what we know. Epistemology is "a way of understanding and explaining how we know what we know" (Crotty, 2003: p.3). It is considered essential in facilitating a philosophical grounding in research in order to understand how we create, develop or acquire knowledge and recognise the peculiarities of the phenomenon at stake, particularly for which the researcher set out to investigate. According to Maynard (2013) and Denzin and Lincoln (2005), epistemological inquiry investigates how researchers perceive the world, influencing how they frame the subject of interest to uncover the inherent knowledge within a phenomenon being investigated. It addresses the validity, scope, and methods of acquiring knowledge, establishing criteria for acceptability and applicability. This ensures the legitimacy of knowledge and provides a basis for selecting an appropriate methodological approach.

Therefore, in the realm of research, while ontology focuses on the presumed existence of things, epistemology is inclined toward the basis of knowledge in terms of whether it is objective, transferrable, real or subjective based on personal insight and experience. Understanding epistemological principles enhances the researcher's ability to navigate the complexities of knowledge acquisition and application in the research adventure (Cohen et al., 2002).

On the contrary, the interpretive epistemological paradigm contends that the social sciences cannot approach human beings and their context in the same way as physical phenomena, differing fundamentally from the natural sciences (Saunders, 2009). Interpretivism, being antipositivistic, ideographic, nomothetic, and voluntaristic, rejects the existence of a standalone reality in the social world and deems absolute facts impossible (Burrell and Morgan, 2019; Blaikie and Priest, 2017). Denzin and Lincoln (2005) and Creswell (2011) posit that the interpretive paradigm values knowledge as being laden with subjectivity, departing from positivism's value-free and objective stance. By emphasising a pre-interpreted, inter-subjective understanding of the social world, this approach considers the meaning attributed by individual social actors in a specific setting (Hudson, 1988; Blaikie, 1993; Dyson and Brown, 2005; Creswell, 2013). Researchers subscribing to interpretivism believe that gaining insight into reality requires a humanistic approach, incorporating language, cultural norms, consciousness, and shared meaning. This philosophy encourages researchers to engage as participant observers, discerning the meaning of actions within specific social contexts rather than standing above or outside them.

5.2.3 Axiology

Axiology in research refers to the ethical or value judgments that guide a researcher throughout the study (Saunders and Townsend, 2016). It encompasses the external, internal, or intrinsic value systems that researchers bring into the research process (Saunders et al., 2016), emphasizing the significance of these values and judgments in shaping the study. As a researcher's values are often fluid and evolving, it becomes essential to explicitly acknowledge these values. By doing so, the researcher clarifies how

their value system may influence or impact the overall conduct of the research, particularly highlighting the specific values emphasized during the research journey.

Furthermore, Carnaghan (2013) underscores the importance of axiology by stating that researchers must transparently declare their values within the study. This transparency is critical to mitigating potential biases and ensuring that value-laden information derived from the study area is presented with clarity. By making these declarations, researchers ensure an honest reflection of the ethical dimensions involved in their work. In this study, the researcher acknowledges the role of their value system in shaping both the research process and the interpretation of findings. Table 5.1 below provides an overview of the philosophical assumptions underpinning this research and illustrates their relevance to the inquiry, offering a structured insight into how axiology, alongside other philosophical aspects, informs the research approach.

Table 5.1: Philosophical paradigm relevance to this research inquiry

Research paradigm	Descriptive questions	Characteristics	Relevance of philosophy to this research
Ontology (reality)	What constitutes the assumption of reality? What constitutes the nature of the world?	Reality is a product of social construction within the human psyche and perception. In this perspective, there is no singular truth; reality is perceived as relative, shaped by the individual's imagination and experiences. Each person actively participates in the social invention and construction of their unique version of reality.	The researcher believes that mainstreaming a strategic thinking approach to planning and impact assessment in Nigeria's oil and gas policy sector can be interpreted in several ways.

Epistemology (knowledge)	What is knowledge? How does the researcher know? What constitutes valid and reasonable knowledge?	Knowledge can be acquired through the perspective and meaning of the social actors attached to the phenomenon being investigated in a particular context. This means that knowledge can be configured and re-configured through the reflective perception of individuals.	Acquiring knowledge is inherently subjective based on individuals who have lived experience and knowledge about the subject being studied. Thus, answering the research questions can be achieved through questionnaires, interviews and literature
Axiology (value system)	What role do values and perceptions play in the research?	The researcher is part of what is being researched, cannot be separated, and will be subjective.	The researcher recognizes the inherent value-bound and reflexive nature of the study. Consequently, values will serve as a crucial factor in interpreting the meaning and opinions expressed by participants, enhancing the credibility of the research findings.

Sources: Blaike, 1993; Creswell, 2009; Denzin and Lincoln, 2011; Easterby-Smith et al., 2012

5.2.4 The Philosophical research paradigm

In research, positionality is underscored by thoughts and assumptions about how information about a phenomenon should be collected, analysed and used (Creswell, 2009). There are several philosophical paradigms in scholarship literature. These include

positivism, critical realism, constructionism or interpretivism and pragmatism (see detail in Table 5.2).

Table 5.2 Research philosophical dimensions

Paradigm	Ontology	Epistemology	Axiology	Methodology
Critical realism	Reality is an objective construct characterized by its permanence and stratified nature, shaped by the ongoing human pursuit of power	Knowledge and facts are contextually rooted and shaped by social constructions over time. Exploring social structures, power dynamics, and mechanisms of control drives this type of research	Research is embedded with values; the researcher acknowledges their perspective while respecting the inherent value of the subject	Quantitative or qualitative
Positivism	Reality and truth exist externally and independently of the social actors within the social context.	Absolute objectivity relies on quantifiable facts, eliminating the need for interaction with the subjects or objects under study	Objective and value-neutral, researchers maintain detachment and distance from the subject, minimizing their impact on participants. The data speaks for itself	Quantitative

Pragmatism	Reality is the tangible outcomes of an idea perpetually reevaluated, deliberated, and construed in response to the dynamic flow of experiences and practices.	Focus on problems at stake, practice, and relevance to derived knowledge.	Value-bound due to researchers' involvement and influence in the reflexive process of the research	Quantitative and qualitative
Interpretivism/ constructionism	There is no single reality as it is socially constructed through perceptions, experience and knowledge of the phenomenon being studied.	Acquiring knowledge is a by-product of interaction between the inquirer and the research participants. Extracting the themes and understanding the patterns of participants' perceptions and views is considered critical in achieving the aim of the study	Value-laden because the researcher is highly involved in the reflexive process of the study	Qualitative

Sources: Easterby-Smith et al. (2002); Sunders et al. (2009); Creswell (2009); Blaikie (1993) and Carson et al., 2001;

5.2.5 Philosophical position of research

The philosophical stance of this study is grounded in two main philosophical positions rooted in social science—namely, the philosophical dimensions of ontology and epistemology (See Table 5.3). From the ontological standpoint, this research embraces realist viewpoints. This is because the environmental planning and management in Nigeria’s oil and gas industry is characterised by diverse actors with disparate interests, which are perceived as independent of individual perspectives, acknowledging potential variations. Based on the ontological reality, the researcher opts for a practical, rather than abstract, approach to conducting the investigation.

Table 5.3: Summary of philosophical considerations

Ontological considerations	
Realist	Relativist
The external world comprises pre-existing hard and tangible structures	The existence of multiple realities as a subjective construction of the mind
Structure exists independent of individual ability to acquire knowledge	Varying socially transmitted terms direct perception of reality
Epistemological considerations	
Positivist	Interpretivist
Application of natural science methods to the study of social reality and beyond	Absence of universal truth and emphasis on realism of context
	Understanding and interpretation come from the researcher's own frame of reference

Sources: (Easterby-Smith et al., 2008; Fitzgerald and Howcroft, 1998; Bryman, 2003)

This research adopted the interpretive position at the epistemological level because this study aims to explore the prospects of a transition from project-level assessment to a strategic-level approach in Nigeria's oil and gas sector. Philosophical scholars like Creswell (2009) and Denzin and Lincoln (2005) argue that interpretivism is crucial for identifying the underlying problems and prospects of the studied phenomenon. Thus, adopting interpretivism can enable the research to embrace different viewpoints of the

actors and relevant stakeholders with a stake in oil and gas exploration and development as well as environmental management issues to explore the prospects of a transition from project-level assessment to a strategic-level approach in Nigeria's oil and gas sector.

4.3 Research design

In a research study, selecting a research design is critical in shaping the overall research process. Ragin (1999) defines research design as a comprehensive plan comprising the strategies for collecting and analysing evidence to enable the researcher to address the problem or questions at stake. Research design addresses the inherent ambiguity and explicitly outlines how the study will be conducted, providing a clear roadmap to accomplish the overarching aim of the phenomenon being investigated (Creswell, 2003; Johannesson et al., 2014). According to Yazan (2015) and Yin (2018), the choice of a research design is driven by specific criteria, which include the research objectives, the degree of influence the inquirer can exert on behavioural events, and the contemporary focus of the study. Various research designs have been advanced within the scholarship literature to offer adaptable approaches to examining a problem at stake. The appropriateness of a research design depends on the situation or subject being investigated. Table 5.4 outlines the different research designs that could be applied to various research, along with their associated characteristics and methods.

Table 5.4: Different types of research design

Research design	Main characteristics	Methodology
Longitudinal design	This research design involves repeated observations of the same variables over extended periods	Quantitative or qualitative
Experimental design	Emphasis is on scientific procedures involving two sets of variables, with the first typically used to measure differences in the second set.	Quantitative
Survey design	It focus on gathering extensive data or information about the trends and perceptions of a population, focusing on a sample from that population.	Quantitative
Grounded theory	This research design is centred on generating or discovering a theory, while a longitudinal design study entails repeated observations of the same variables over extended periods.	Qualitative
Ethnography design	This research design is concerned with studying an individual, an entire culture, or people's day-to-day activities within a specific social context.	Qualitative
Phenomenology design	It seeks to unravel the nature of things through how individuals or people view and experience them.	Qualitative
Case study design	It involves the study of single or multiple cases within a real-life contemporary context	Qualitative or mixed method

Sources: (Creswell, 2003; Johannesson et al., 2014; Bryman, 2012; Yazan, 2015; Yin, 2018).

5.3 Rationale for case study design

Case study research has been synonymous with investigating or examining a real-life and in-depth phenomenon within its environmental context. This type of research typically involves the investigation of an individual, a group, an institutional or governance context, a problem, trends, events or anomalies (Yin 2014). The approach allows for a multi-faceted and in-depth exploration of phenomena in a real-life environment. This is

the main reason case study research is often described as a "naturalistic" design to distinguish it from an "experimental" design, which involves randomised controlled trial, where the researcher is inclined toward exerting control over the process and manipulating the variable(s) of interest (Stake 2005). Therefore, unlike experimental research, the contextual environment is not controlled or delineated in the case study research but becomes an integral part of the study. The main characteristic of the case study design is non-random sampling flexibility, where there is no sample that precisely represents a broader population. In contrast to other research designs, particularly the quantitative studies, the selection of cases is driven by their inherent interest, appropriateness or theoretical considerations (Eisenhardt and Graebner 2016; Stake 2005). As Creswell (2014) and Bryman (2012) pointed out, the key consideration in within-case and across-case analyses is generating data through qualitative means such as interviews, contexts or document analysis, and participant observation. The adoption of the case study design enables the researchers to devise a leeway for triangulating data as part of data-gathering strategies, which often leads to detailed case descriptions.

There are two types of case study research: single and multiple cases. According to Yin (2014) and Stake (2005), the main advantages of a single case study lie in its capacity for detailed description and analysis, providing a researcher with an opportunity for a comprehensive understanding of the 'how' and 'why' behind occurrences of the phenomenon. Single case studies allow the researcher to delve into the complexities of a phenomenon, effectively opening the black box to explore the underlying causes of the problem or phenomenon. Such studies can facilitate the identification of patterns and relationships, enabling the researchers to contribute to an existing theory and or create or test theories (Gomm et al., 2000; Merriam, 1998). In contrast, multiple-case study research derives its advantages from cross-case analysis. Within the multiple-case design, there is an opportunity for systematic comparison of cases in order to unravel similarities and differences, enabling the discussion and how they affect findings. Each case can be distinctively analyzed, allowing for the comparison of identified mechanisms, which can lead to theoretical conclusions (Denzin and Linco, 2005). Consequently, the choice of case study research has multiple objectives in relation to contributing to theory. At one end of this spectrum, case study research has enormous added value in

developing a theory by expanding its inherent constructs and relationships in distinct settings—such as single case studies. On the other end, case study research can play a central role in advancing theories by focusing on differences and similarities of cases—like in multiple case studies.

The selection of a case study is often guided by the formulated research question(s), reviewed literature, and underlying theories, all of which are crucial in defining a case (Stake, 1995; 2005). Importantly, each case is expected to establish a pre-determined environment or geographical area of interest to the researcher, the types of evidential data to be collected, and the priorities for data collection and analysis. This perspective is further stressed by Merriam (1998), who contends that the selection of a case study is primarily guided by its potential to unveil insights related to the subject of concern and interest. In some instances, the choice is driven by the inherent interest or the case's ability to shed light on complex issues. Stake (2010) aligns with this view, suggesting that case studies are often chosen due to their unique characteristics, offering the potential to reveal previously unknown phenomena or knowledge within a social context. The choice of a case enables the researcher to thoroughly explore, analyse and explain issues within a specific context, typically involving selecting a small geographical unit manifested in either a single case or multiple cases.

In view of the foregoing, the case study approach proved instrumental in allowing the researcher to examine real-life situations and gather credible, detailed information on the study area. This method enabled an in-depth exploration of the prospects of a transition from project-level assessment to a strategic-level approach in Nigeria's oil and gas sector. However, the case study method also presents challenges, particularly in defining the scope of the case. Selecting a case can be complex, as it may be too broad or too narrow in scope, requiring the researcher to carefully decide which bounded system to investigate (Creswell, 2013). Despite these challenges, employing a mixed-methods strategy, combining both quantitative and qualitative approaches, was deemed appropriate for obtaining comprehensive data across various jurisdictions. This mixed-method approach allowed for the generation of in-depth insights, perspectives, and knowledge from key actors and stakeholders with stake and interest in oil and gas development vis-à-vis environmental management practice in Nigeria.

5.4 Resercah methods

Although it is widely acknowledged that a researcher's philosophical perspective significantly shapes their worldview, the importance of selecting an appropriate research methodology should not be underestimated. Saunders et al. (2016) emphasize that the methodological foundation of a study is crucial, and a misalignment in methodology can compromise the integrity of the entire research. Birks and Mills (2014) define research methodology as a set of guiding principles that direct the design of a study. It serves as a practical framework for achieving the study's objectives, with the expectation that the methodology could be replicated in similar research contexts. However, the selection of research methods must align not only with the study's objectives and context but also with the researcher's beliefs, interests, and assumptions. The choice of methodology is inherently influenced by these factors, shaping how data is collected and analyzed. The overarching goal of selecting research methods is to determine the most appropriate way to gather and interpret data, ensuring the methodology is aligned with the nature of the research questions. Research methods typically fall into three categories: quantitative, qualitative, or mixed-method approaches. The choice between these methods depends on the nature of the data required for the study. Quantitative research analyses numerical data statistically, while qualitative research focuses on textual or observational data to explore deeper meanings. Mixed-methods approaches combine both, offering a comprehensive view of the research subject (Creswell and Creswell, 2005; Bryman, 2016). The subsequent sections provide a brief overview of both quantitative and qualitative research methodologies.

5.4.1 Quantitative research approach

The quantitative research method finds common application in the natural sciences, where researchers often assert that phenomena that can be quantified or measured are inherently more scientifically credible than those that cannot (Bryman, 2011). Quantitative research uses numerical values and precision to explore a phenomenon by employing a positivist and objectively-driven epistemology, primarily concerned with uncovering universal laws governing social actions and behaviours through statistical measurements (Creswell and Tashakkori, 2007). This approach endorses that the phenomenon of interest represents an objective reality independent of the researcher,

establishing a perceived separation between the two entities (Yilmaz, 2013). Quantitative research begins with theory deduction, logically deriving valid knowledge from the researcher's deductive reasoning, and is characterized by a deductive orientation throughout the research process (Becker *et al.*, 2012)Denzin and Lincoln, 2011). Central to this method is using empirical tools to establish causal relationships and explanations between isolated variables within a value-free context. Researchers in quantitative studies engage in theory testing and hypothesis verification related to the research phenomenon, often employing neutral observation without active participation or control over the subject under investigation. The preference for quantitative data allows researchers to measure attributes, behaviours, beliefs, and other variables, facilitating the validation or refutation of theories through contextualized data analysis.

According to Bryman and Cramer (2012), various data collection approaches define quantitative research methods, encompassing surveys, questionnaires, experiments, controlled observations, and the manipulation of pre-existing data. These methods aim to gather data in a definitive and objective format, focusing on questions related to "how much" or "how many," depending on the study's variables. In quantitative research, the sample size of the population holds significant importance, as a larger sample is seen as more representative and generalizable, influencing the statistical instruments crucial in shaping conclusions. Slevitch (2011) and Bryman (2012) highlight several techniques associated with quantitative research, including inferential statistics models, hypothesis testing, experimental and quasi-experimental randomization, pre-tests, structured analysis, and questionnaires featuring a limited range of pre-determined responses. However, Slevitch (2011) suggests that the selection of instruments and their ability to measure all variables comprehensively are critical considerations for addressing validity and reliability concerns in research.

5.4.2 Qualitative research approach

The qualitative method is "empirical research where the data are not in the form of numbers" (Punch, 1998; p. 4). It is particularly relevant when the research problem lacks significant variables producing statistically measurable outcomes, diverging from the statistical focus. Scholars, including Creswell (2003), Neuman (2004), and Denzin and

Lincoln (2005), identify qualitative research as an umbrella term for investigations within a naturalistic context, distinct from the quantitative approach. Qualitative research is considered humanistic and naturalistic, adopting a descriptive approach to understanding and documenting the socially constructed experiences and meanings of individuals or groups in a specific setting, an aspect that is challenging to capture through quantitative methods (Denzin and Lincoln, 2018). In qualitative research, the researcher concentrates on grasping the contextual meaning and interpreting participants' perspectives on the research problem. This often involves seeking textual evidence or data from locations or cases where a few respondents share a common concern, an approach incompatible with quantitative numeric representation (Creswell, 2003; Gelo, 2008; Yazan, 2015). Researchers using qualitative methods do not confine participants to fragmented situations to gather information, as the approach allows for considering the contextual and cultural setting. This approach can further enable the understanding of the complexities underlying the social setting by observing participants' behaviours and attitudes. This observational approach facilitates interpreting the phenomenon from the subjective viewpoint of the participants. Qualitative researchers are often portrayed as passionate observers driven by curiosity to comprehend how participants construct narratives around the research problem and make sense of their surrounding experiences (Creswell, 2013; Easterby-Smith et al., 2012; Saunders et al., 2009).

Unlike quantitative research, which relies on a deductive and theory-driven approach where researchers observe a specific phenomenon based on a chosen set of theories, the qualitative approach, known as inductive and data-driven, enables researchers to initiate the research process by observing a phenomenon to develop theories related to the questions at hand. According to Gelo (2008), hypothesis formulation in the qualitative approach is an integral part of the research exercise that seeks to develop an appropriate theory based on the findings produced (exploratory study). This means that the inductive nature of qualitative research allows a researcher to navigate between themes and datasets throughout the research process until a detailed set of themes emerges to form a theory. In contrast to the deductive formulation of hypotheses in quantitative research, where hypotheses are derived from theory and must be empirically falsified (confirmatory study), qualitative research, as noted by Bryman

(2012), is characterized by the use of multiple sources to derive data. These sources include open-ended, unstructured interviews, written documents, observation, focus group discussions, and visual text. These techniques assist the researcher in understanding the meaning individuals attach to social issues, potentially elucidating the underlying complexities of human behaviour. The strength of the qualitative orientation in research lies in its ability to provide the researcher with rich, holistic, and detailed data based on the spoken narratives of research participants within naturalistic settings (Lincoln and Guba, 1994; Gelo, 2008).

5.5: Differences between the quantitative and qualitative methods

Dimensions	Quantitative research	Qualitative research
Purpose	Focus on quantifying data and generalise results from a sample of the population of choice To measure the occurrence of various opinions and views in a selected sample	It enables the understanding of underlying reasons, factors and motivations To uncover prevalent trends in thought and opinion To provide insights into the setting of a problem, generating ideas and/or hypotheses for later quantitative research
Sample	Many cases often represent the consideration of the population of interest using randomly selected respondents	Use few participants in non-representative cases. Participants selected to fulfil a given quota Summarising, categorising and interpreting
Data collection	Structured techniques such as questionnaires	Structured or unstructured techniques such as group discussion or in-depth interview
Data analysis	Numbers, graphs, tables and a few words and findings are	Non-statistical

	conclusive and often descriptive in nature	
Outcome	Used to recommend a final course of action.	Exploratory or investigative. Findings are inconclusive and suitable for generalizing to the broader population of interest. It can be used as a way of establishing an initial understanding and a solid foundation for subsequent decision-making

Sources: (Creswell, 1994; Denzin and Lincoln, 2018; Bryman, 2012)

5.4.3 Mixed method

As stated above, the mixed-method research approach combines a quantitative and qualitative approach to achieve the overall aim of the study. Mixed-method research (MMR), defined by Johnson and Onwuegbuzie (2004) as a strategy combining quantitative and qualitative research techniques, has gained prominence in the research community. A mixed-method research orientation is an alternative to quantitative and qualitative research to gain sufficient and broad coverage of the study being investigated (Creswell and Clark, 2011; Bryman, 2012). MMR is increasingly recognized for its capacity to deepen research findings, enhance rigour, and expand participant coverage. Combining the quantitative and qualitative approaches is also called a triangulation strategy, where the researcher can employ various techniques to gather and triangulate data to achieve the research aim. Data triangulation involves multiple sources providing data across different times; methodological triangulation uses quantitative and qualitative methods; and triangulation theories link one theory to explain a phenomenon in connection with another field. Therefore, the choice of MMR allows the researcher to leverage the benefit of using a diverse data collection, sampling, and analysis technique, enabling a comprehensive investigation of the phenomenon at stake. In addition, this approach minimizes potential biases associated with reliance on a single data source or

method, contributing to a more robust research design (Tashakkori and Teddlie, 2011). The mixed-method research, in which the researcher combines the quantitative and qualitative approaches, has these characteristics:

- Gathers and analyses quantitative and qualitative data depending on research questions in a thorough and rigorous procedure
- More data can be better derived from converging or triangulating the findings from quantitative and qualitative than relying on a single strategy alone
- The utilisation of one method can be used to offset the shortcomings of the other method. For instance, mixed-method research can facilitate a more comprehensive understanding and gathering of information on a particular phenomenon being investigated.
- Research inquiry that seeks to unearth large and interconnected complexities might find it difficult to achieve its objectives by relying on one method, which often hides certain important information about the subject matter
- The MMR enables the researcher to approach the research problem from the conviction of quantitative as an explanatory strategy at first and then followed by more qualitative thinking as an exploratory mechanism
- The quantitative-based numbers can be used to add more rigour and precision to the narrative dimension of the study
- The combination of mixed-method research essentially facilitates ease in answering a broader and more complete array of research questions
- MMR enables the researcher to present a shred of more robust evidence through convergence and a combination of the research findings.

However, there is no one-size-fits-all methodology suitable for every researcher. The convergence of quantitative and qualitative research has its advantages and disadvantages, which should be considered while selecting the MMR research approach.

5.6: Table: The merits and demerits of a mix-method research approach

Merits of mix-method research approach	Demerits of the mix-method research approach
• It can use words, narratives and pictures to ascribe meaning to numbers • The use of numbers can significantly add precision to narratives, words and pictures • It can enable the researcher to address a more broad range of research questions • It allows the researcher to present a strong case of evidence in the study's conclusion • It facilitates the means of generalisability of the research findings • Researchers can effectively generate as well as test grounded theory	• It is often inconveniencing for an individual researcher to undertake both quantitative and qualitative • It is time-consuming for a researcher • A researcher must learn the use of multiple techniques and approaches in a single study • A mix-method is expensive

Source: Johnson and Onwuegbuzie (2004)

5.4.4 Adopted research design

Given the exploratory and contextual nature of this research, along with the need for an in-depth analysis of the selected case, a case study design was adopted. This decision was informed by the study's alignment with both quantitative and qualitative philosophical paradigms previously discussed. Yin (2009, p.18) describes the case study approach as having pragmatic potential, allowing researchers to thoroughly explore contemporary phenomena within their real-life contexts. This made the case study an appropriate choice for examining the prospects of a transition from project-level assessment to a strategic-level approach in Nigeria's oil and gas sector. Thus, in order to achieve the research objectives while addressing the complexity of the selected case, which required substantial data from a diverse population, the researcher adopted a

convergent mixed-methods approach. This pluralistic strategy integrated both quantitative and qualitative research methods, avoiding the limitations of relying on a single methodological approach. Johnson and Onwuegbuzie (2004) argue that research aiming to unravel intricate, interconnected complexities often fails to achieve its objectives through a singular method, as it may overlook essential information. Therefore, employing a mixed-methods approach seems appropriate to enable the researcher to achieve the overall aim of this study.

5.4.5 Mixed method as a methodological choice for this research

Given the philosophical position of this research, mixed-method research (MMR) approaches were adopted. This approach is often referred to as a convergent strategy in research due to its pragmatic potential to allow the researcher to use an array of methodological options to draw information from both quantitative and qualitative techniques to achieve the objectives of the phenomenon at stake (Creswell, 2014; Bryman, 2012). MMR was chosen because of the nature of the research objectives, the information needed and the areas of the study. The MMR approach enabled quantitative and qualitative data collection within this research. This approach allowed the researcher to collect a wide range of contrasting and complementary data on the prospects of a transition from project-level assessment to a strategic-level approach in Nigeria's oil and gas sector. This approach significantly enriched the research process, fostering a profound and comprehensive comprehension of the phenomenon under investigation. By facilitating the interchange of distinct advantages and disadvantages between the chosen methods, this MMR strategy allowed a synergistic process that placed an emphasis on harnessing the strengths of each quantitative and qualitative research method to obviate the drawbacks of the other. In particular, the MMR strategy enabled the research to offset the characteristics of large sample size, inclination, trends and generalization that underlie the quantitative method with the nuanced insights gained from a smaller, more detailed approach in the qualitative method. This dynamic strategic interplay deepened the overall comprehension of the research subject and fostered a more nuanced analysis, capturing the complexities and subtleties that might have been ignored with a singular methodological approach.

Furthermore, the adoption of the MMR strategy improves the robustness of the research study by providing the means for the triangulation of the collected data. The synthesis of contrasting perspectives and opinions through different methods contributed significantly to the depth and reliability of the research findings, offering a more nuanced and comprehensive account of the complexities inherent in the subject under investigation.

5.5 Resercah strategy adopted in this study

This section provides a comprehensive overview of the mixed-methods research approach utilized in this study. The first phase focuses on the quantitative aspect, detailing the design and development of the questionnaire, the pilot study conducted to refine it, and the overall administration and implementation process. This phase lays the foundation for collecting measurable data, ensuring its relevance to the research objectives. Likewise, this section discusses the qualitative methods employed to gather in-depth insights. It describes the interview process, outlining the rationale for participant selection and the sampling methods to ensure a representative and diverse sample. The qualitative phase also highlights the approach to data analysis, explaining how the information gathered through interviews was processed and interpreted to provide a richer, contextualized understanding. The mixed-methods research of quantitative and qualitative approaches offers a robust and holistic framework for achieving the research's overall goals.

5.5.1 Phase One: Quantitative method

This section provides an in-depth explanation of the quantitative data collection process, which utilized a survey questionnaire to gather information on the research topic from two distinct respondent groups: community members and EIA practitioners. The rationale behind choosing a survey questionnaire is thoroughly discussed, highlighting its suitability for collecting structured and comparable data from a broad sample. In addition, the section explores the design and structure of the questionnaire, including the types of questions employed to capture relevant insights. It also outlines the methods used to administer the survey, detailing the sampling techniques and the geographical locations from which the samples were drawn. The approach to

quantitative data analysis is discussed, explaining how the data was processed and interpreted to generate meaningful conclusions. The subsequent sections of this chapter provide further detail on the specific methods and processes employed to collect and analyze the quantitative data for this research.

5.5.1.1 Questionnaire

A questionnaire is a research tool designed to gather responses and viewpoints from participants on a specific subject (Zikmund, 2003). Questionnaires can be structured or unstructured. In this research, structured questionnaires were employed, allowing respondents to select the most appropriate response for each topic. According to Denscombe (2017) and Bryman (2016), data collected through structured questionnaires often leads to quantitative data that is straightforward to analyze using statistical methods. However, this approach has limitations, including restricted questions, reduced researcher input, and potential biases that may influence responses (Bryman, 2004; Saunders et al., 2016). For example, respondents may provide inaccurate information or misinterpret questions, and superficial data collection can occur when respondents lack the time or motivation to answer accurately (Collins and Hussey, 2009; Dudovskiy, 2018). Additionally, some participants may opt out, leading to incomplete responses (Bryman, 2016). In order to mitigate these limitations and enhance the credibility and reliability of the research findings, several measures were implemented. These included thorough sensitization of respondents, pre-testing the questionnaire before administration, sending personalized cover letters, making contact with respondents, ensuring anonymity, and designing concise and straightforward questions to avoid overly lengthy or complex wording.

5.5.1.2 Questionnaire type and design

This study employed a questionnaire survey to gather relevant data from diverse individuals. According to Zikmund (2003), questionnaires can be categorized based on their design and method of administration, both of which are influenced by the research objectives, target population and study area. In this study, clarity and simplicity were emphasized in the questionnaire design to avoid ambiguity and confusion. Scholars such as Gill and Johnson (2010) emphasize the importance of a multi-stage approach in

designing questionnaires, whether they consist of open- or closed-ended questions. Consequently, this research utilized closed-ended questions to provide respondents with structured options, ensuring clear and concise data collection (Saunders et al., 2009; Fink, 2002; Hair et al., 2007). Given the research's aim, which focused on prospects of a transition from project-level assessment to a strategic-level approach by identifying critical decision factors and transition pathways as well as developing a framework to facilitate the transition in Nigeria's oil and gas sector, the questionnaire was carefully conceived and designed to ensure relevance, linearity and clarity. In order to achieve the aim of this study, as referenced above, two separate questionnaires were designed for this study, each tailored to a specific group of respondents: one for community members residing in the oil and gas old frontiers in the Niger Delta region and another for EIA practitioners. Both sets of questionnaires were crafted based on a six-point Likert scale format and distributed in paper-based and online formats. Cohen et al. (2018) assert the importance of standardizing response options in questionnaires to foster meaningful interaction between researcher and survey respondents. The Likert scale format enabled respondents to express their agreement or disagreement on a linear scale, thus facilitating the collection of quantifiable and comparable data.

The community questionnaire was designed to gain insights into the impact of oil and gas exploration and production on the environment and livelihoods in the Niger Delta region, the centrality of EIA to oil and gas environmental decision-making and the roles of relevant actors in environmental management. In the same vein, the practitioner's questionnaire was intended to gain insights regarding the current state of EIA practice and its associated strengths and limitations in Nigeria's oil and gas sector. Embedded in the practitioner's questionnaire were questions regarding the respondents' perspectives on SEA awareness, its acceptance, and the level of recommendations for its potential integration into Nigeria's oil and gas planning and development, including any barriers that might hinder its adoption. The design of both questionnaires followed established principles of questionnaire development as outlined by Gill and Johnson (1991), Oppenheim (1992), Dillman (1991) and Moser and Kalton (1971). These principles included a focus on:

- Questionnaire phraseology;
- Form of response;
- Questions sequence;
- Overall presentation; and
- Introduction to respondents

The structured approach to the questionnaire design played an essential role in ensuring that all relevant themes identified in the literature were covered, providing a comprehensive tool for data collection that aligned with the research objectives.

5.5.1.3 Questionnaire and pilot study

More often, in research processes or endeavours, conducting a pilot study for a questionnaire is considered a crucial step before its formal deployment. This preliminary phase, often referred to as piloting, serves to refine questions and procedures that may otherwise produce inconsistent or insufficient responses, thereby limiting the researcher's capacity to gather vital data necessary for achieving the research objectives (Creswell, 2014). Oppenheim (2003) asserts that piloting is an essential prerequisite in research, as it allows for the evaluation and testing of data collection instruments concerning their structure and content, ensuring that all respondents interpret the questions uniformly. As a result, the decision to pilot the researcher's questionnaire facilitated the establishment of inclusion and exclusion criteria, thereby enhancing the reliability and validity of the research questions. Furthermore, Lancaster et al. (2004) highlighted the significance of conducting a pilot study, whether internally or externally, with a predetermined number of participants, underscoring its beneficial influence on the rigour of the research. The objectives of a pilot study in research encompass the following:

- Testing and validating whether the survey questionnaire effectively addresses the intended research questions
- Clarifying the comprehensibility of the questionnaire format
- Identifying any obstacles to participant recruitment
- Identifying potential barriers to operational processes

- Validating the structure and content to ensure alignment with the research objectives

In light of the foregoing factors, two phases of the piloting process were conducted for this research. During the first phase, a preliminary version of the questionnaire was distributed to eight academic staff members at Newcastle University. These individuals were selected for their expertise in questionnaire design and their shared interests in environmental assessment and management, the oil and gas sector and statistics. Each staff member provided valuable feedback, resulting in constructive questionnaire modifications. In the second phase, the researcher, with the assistance of two research assistants, administered the questionnaire to pertinent community members in the Niger Delta region, as well as to EIA practitioners within the oil and gas sector. This piloting process was highly advantageous, allowing the researcher to enhance and revise the questionnaire based on the feedback obtained. The piloting not only facilitated essential improvements to the questionnaire but also played a crucial role in collecting significant information. This information subsequently informed the evaluation of the appropriateness of the instrumentation techniques employed to meet the research objectives. Additionally, the pilot studies highlighted practical considerations related to safety, logistics and the accessibility of informants and gatekeepers across the various jurisdictions and organisations where the questionnaires were administered.

5.5.1.4 Sampling

Saunders et al. (2009) define sampling as the process of selecting a subset from a target population in a research study. This process is crucial, as it is often impractical to include the entire population of interest, necessitating the use of a significant subset to collect data that addresses specific research questions or objectives (Turner, 2020). Sampling methods are generally divided into two categories: probability sampling and non-probability sampling. Probability sampling entails a known chance of selecting each individual or item, with examples including simple random, cluster, stratified, and systematic (Creswell, 2014). Conversely, non-probability sampling does not provide a known likelihood of selection for each individual or item and includes techniques such as purposive, convenience, quota and snowball sampling. Teddlie and Yu (2007) and

Saunders et al. (2009) assert that irrespective of the sampling method utilized, the primary objective remains to ensure that the selected respondents accurately represent a subset of the population, thereby facilitating the reliable and valid derivation of findings that can be generalized. Consequently, when approaching the research problem from a quantitative standpoint, researchers typically engage in selecting a relatively large number of units from a population or specific subgroups (strata) of a population in a random manner, where the probability of inclusion for every member of the population is determinable (Tashakkori and Teddlie, 2003a, p. 713).

For this research, two key populations were identified: communities who live in the oil and gas old frontiers in the Niger Delta region and one with EIA practitioners. The researcher used stratified random sampling to categorise the EIA practitioners who were deemed appropriate and knowledgeable to respond to the questionnaire in a stratified manner. The researcher employed stratified random sampling to effectively categorize the EIA practitioners who were considered suitable and knowledgeable to respond to the questionnaire. As noted by Easterby-Smith et al. (2012) and Creswell (2014), the simple random sampling method ensures that each unit within the sample has an equal chance of selection. This method is crucial for providing an unbiased and precise estimation of parameters, especially when the population exhibits homogeneity in perspectives and experiences. By utilizing this sampling technique, the researcher was able to make informed choices regarding the categories of individuals, as well as the organizations, agencies and departments associated with them. This strategy facilitated an accurate representation of the population under study by first dividing it into distinct strata before applying a random sampling method. Consequently, this approach guaranteed that each subgroup was adequately represented within the sample.

Creswell (2014), along with Saunders et al. (2009) and Oppenheim (1992; 2003), highlighted the importance of employing a simple random sampling technique in quantitative research when the population is accessible. Similarly, the same stratified and simple random sampling methods were utilized at the community level. In this simple random sampling approach, every unit within the population had an equal likelihood of

being included in the sample, a methodology that was effectively implemented in this research.

5.5.1.5 Participants sample size

The sample size refers to the process of determining the number of participants or the population to be included in a study. It is a fundamental aspect of any research which aims to draw meaningful inferences or conclusions about the broader population based on the selected sample. Cohen et al. (2000) emphasize the importance of identifying an appropriate sample size to minimize or avoid errors or bias to ensure the generalisability and repeatability of the findings. To achieve this, researchers must take into account various factors, including the research objectives, data analysis methods, the presence of subgroups within the sample, characteristics of the population, and the geographical area of the study (Creswell, 2014). The criteria for determining the sample size in this research were informed by the works of Cochran (1977) (as cited in Cohen et al., 2000; Lodico et al., 2006), Morse (1991; 2000), Thomson (2004), Creswell (2014), Krejcie and Morgan (1970). The consensus among these scholars is that a sample size between 30 and 500 at a 5 per cent confidence level is appropriate for research that seeks to collect sufficient and relevant data to address the research objectives, and the rationale for the size should reasonably reflect the quality of the sample in this wide interval. Consequently, the research opted for a sample of 200 EIA practitioners and 500 community members.

5.5.1.6 Administering the questionnaire

The survey questionnaire was administered in two distinct phases in this study. In the initial phase, the researcher, with the support of two research assistants, chose to begin the process of administering the questionnaire to community members from the seven selected oil-producing communities in the Niger Delta region. To foster rapport and trust, consent and introductory letters were obtained from the chairpersons of the Local Government and village heads in each selected area. These local leaders wielded considerable influence within their communities, which was instrumental in creating a conducive atmosphere for the questionnaire administration. As previously noted, a total of 500 questionnaires were distributed across various locations within seven oil-

producing communities in the Niger Delta region, using a simple random sampling method. Consequently, a total of 338 completed questionnaires were successfully retrieved.

The practitioner survey commenced with obtaining consent and introductory letters from the Chief Executive Officers of the selected organizations, agencies and departments to administer the questionnaire. Following the receipt of this approval, questionnaires were distributed to the relevant heads of departments or units associated with the phenomenon under investigation. This method ensured that each potential respondent within formal organizational structures received a personalized cover letter, which underscored the significance of completing the questionnaire in a formal manner. Such an approach not only reinforced the level of commitment but also effectively facilitated the distribution of questionnaires within the designated organizations. Concurrently, the researcher and research assistants utilized personal contacts to distribute additional questionnaires. As previously mentioned, a total of 200 paper questionnaires were disseminated to EIA practitioners, resulting in the retrieval of 186 completed responses. Notably, the number of completed questionnaires obtained from EIA practitioners surpassed those collected from community members. It is imperative to note that, throughout both phases of the questionnaire administration, not all distributed questionnaires were returned, as achieving a 100 per cent retrieval rate in survey research is often a challenging exercise. Creswell (2014) posits that it is highly probable that not all administered questionnaires will be retrieved in a research study.

In this study, various factors led to the incomplete collection of administered questionnaires. For instance, some participants indicated a preference for receiving incentives prior to filling out the questionnaire. Furthermore, there were instances where blank questionnaires were submitted, signifying that respondents had not completed them. In sum, the completed questionnaires were carefully stored in a secure field bag and subsequently transported to a designated data storage facility. This process facilitated the sorting and organising the data using a colour-coded spreadsheet for identification and tabulation.

5.5.1.7 Quantitative data analysis

Quantitative data analysis employs statistical methods to interpret numerical data and uncover patterns, trends and relationships (Bryman, 2004; Creswell, 2011). In order to make sense of the quantitative data collected from the two sets of questionnaires—one for community members and the other for EIA practitioners, the Statistical Package for Social Scientists (SPSS) was selected as the primary tool for analysing data in this study. In particular, SPSS version 22 was considered suitable due to its robust capacity to handle large datasets and minimize errors, making it a widely accepted software for statistical analysis in research. The SPSS tool was instrumental in analyzing key characteristics of the respondents, assessing their knowledge and lived experiences and determining the significance of the results. The responses from the two sets of questionnaires were numerically coded and subsequently input into the SPSS system for analysis. By leveraging SPSS, the researcher was able to systematically explore relationships between variables and provide insights based on the data collected.

The findings from the quantitative analysis are presented in Chapters Six and Seven of this thesis. Descriptive analysis, including measures of central tendency, frequency, mean, and variability, was used to explore the distribution and trends in the data. Additionally, cross-tabulations were employed to determine the presence or absence of relationships between variables, offering a detailed view of how different factors interact within the dataset. This approach enabled the researcher to effectively analyze and interpret the data, contributing to a clearer understanding of the broader implications of the findings, particularly in relation to the research objectives. By utilizing SPSS, the quantitative data analysis provided a solid foundation for drawing meaningful conclusions about the study's key themes, patterns, and relationships.

The Kruskal-Wallis H test was used to determine if there are statistically significant differences between two or more groups of an independent variable on a continuous or ordinal dependent variable. The test is commonly used in the analysis of three or more groups. In order to analyse two groups, the Mann-Whitney U test was also used instead, and in both cases, the data are assumed to have a similar distribution across the groups. The Mann-Whitney U test was used to compare responses between two groups of

participants. Additionally, the Jonckheere-Terpstra test was used to determine if there are statistically significant trend between an ordinal independent variable and a continuous or ordinal dependent variable. Furthermore, Kernel regression was employed to estimate the conditional expectation of a random variable. The objective is to find a non-linear relation between a pair of random variables.

5.5.2 Phase Two: Qualitative method

In this data collection phase, the researcher aimed to gather the opinions and perspectives of the participants regarding the prospects of a transition from project-level assessment to a strategic-level approach in Nigeria's oil and gas environmental management regime. To achieve this, it was deemed imperative to gather in-depth, qualitative insights from key actors and stakeholders with interest and stake in oil and gas exploration and environmental management, which could not be effectively captured through questionnaires or quantitative methods. Therefore, the following sections detail the rationale for the selection of participants, the data collection procedures, the method for data analysis, and the ethical considerations that were addressed, along with the limitations encountered during the research.

5.5.2.1 Interviews

Interviews are described as "night goggles," allowing researchers to perceive that which is not ordinarily visible and scrutinize that which is often looked at but seldom seen (Rubin & Rubin, 2005: p. 7). According to Monette et al. (1986: 156) characterisation, an interview principally involves an interviewer reading questions to respondents and recording their answers. Interviews are prevalent in social science research, distinguishing themselves from other data collection techniques such as observations, focus group discussions, documentary analyses, and audiovisual materials (Yin, 1994; Creswell, 2009). Organizing focus group discussions with potential participants from various geographical regions is often considered impractical and unfeasible due to numerous challenges, including time constraints, financial costs and security concerns. The interview method is particularly suitable for qualitative research, as it offers flexibility that enables researchers to engage in meaningful dialogues with participants, facilitating the exchange of views and opinions on shared topics of interest (Kvale, 2007; Sreejesh

et al., 2014; Bryman, 2016). The preference for interview choice is further reinforced by the observation that it requires less participant involvement and is generally less burdensome than focus group discussions. Therefore, for this research, the interview method was chosen as the primary approach for gathering qualitative data, owing to its advantages over other techniques. However, interviews are typically categorized into structured, semi-structured and unstructured, as illustrated in Table 5.7 below.

Table 5.7: The classifications of interviews in qualitative research

Structured interview	Semi-structured interview	Unstructured interview
The interviewer directs the interview. Pre-arranged questions are set, with no room for deviations. Participant has a limited scope of response.	Pre-set topics and questions guide interactions. The interviewer is expected to strike a balance between obtaining the necessary information and collecting information deemed by the interviewee to be of importance.	The opinions of the interviewees are paramount in this form of interview. Participants are encouraged to express themselves on their values, thoughts and attributed meanings. The interviewee controls the mode of interaction.
The ordering and language used in asking the question are fixed and standardised for interviewees.	The interviewer can ask follow-up questions, a departure from the set questions. The wording of questions can be adjusted to make the interviewee understand them better.	Structures, procedures or specific questions are of no importance. The interviewee and the interviewer are at liberty to adjust the situation.
These are relatively quick and easy to administer	The interview guide is designed to make the process easier to manage	This could consume quite a bit of time and be difficult to manage due to its unscripted nature
Answers can be processed quickly.	Data collected are rich and detailed.	Data collected would be rich but will also include quite a bit

		of information that may not be required
Not required when insight or depth is required due to the structured nature of the answers required	Allows the discovery or provides insight into issues important to interviewees not previously identified by the researcher	Considered helpful in areas where there is little knowledge about the subject matter or in the investigation of a different perspective on a known topic
Quantitative research	Typically, qualitative research	Useful in-ground theory

Sources: (Cohen and Crabtree, 2006; Kvale, 2007; Creswell, 2009; Robson and McCartn, 2011; Bryman, 2016)

In qualitative research, the semi-structured interview technique is utilized when the researcher seeks to gather insights into individuals' knowledge, viewpoints, and comprehension regarding the how, why, and what of their past or current experiences related to a specific issue of mutual interest with the investigator. This method is widely recognized for its value in engaging individuals who possess privileged information—those with significant and unique experiences and insights into a particular topic, allowing them to articulate their understanding of the social world through their narratives (Guba and Lincoln, 2005). Within this methodological framework, participants are presented with various questions aligned with predetermined themes pertinent to the research problem being explored. Respondents are granted complete autonomy in their responses during the interview process. This data collection strategy is instrumental in fostering a conversational and adaptable environment, which permits the researcher to introduce new or follow-up questions to gain further clarity or insight as relevant themes naturally arise throughout the interview.

Open-ended questions are used in interviews to help respondents provide comprehensive and detailed information within a supportive environment, thereby allowing the researcher to effectively meet the research objectives. The use of semi-structured interviews as a secondary method for data collection in this study has enabled

the researcher to gain a deeper understanding of the intricate and subtle aspects of the investigated phenomenon. This approach also permits the interviewer to modify questions and their wording as necessary to enhance clarity, explore specific topics more thoroughly, and introduce new concepts for additional investigation. The semi-structured interview is regarded as the most appropriate method for examining the essence of the study, particularly in addressing questions related to who, how, and why, which in turn generates rich and insightful data regarding the knowledge and experiences of the participants. Capturing the profound opinions, perceptions, and experiences of individuals who influence decision-making is crucial in the context of a semi-structured interview (Kvale, 2007; Robson, 2011).

In view of the foregoing, a semi-structured interview was chosen as the most suitable tool for gathering data. The rationale for conducting the interview was informed by the aim of the research, the type and nature of the information required and the study area. For instance, the prospects of a transition from project-level assessment to a strategic-level approach in Nigeria's oil and gas environmental management regime typically require textual information that is crucial for understanding the complexities of the transition.

5.5.2.2 Interview sampling and selection

There are two primary categories of sampling techniques: probability sampling and non-probability sampling (Saunders et al., 2009). Probability sampling is generally aligned with quantitative research methodologies, while non-probability sampling is more commonly associated with qualitative research approaches (Saunders et al., 2009). In the context of this study, the researcher opted for a non-probability sampling method to select participants. To ensure the collection of high-quality and pertinent information that aligns with the study's overarching objectives, the researcher carefully considered various non-probability sampling techniques, including purposive, quota, self-selection, snowball and convenience sampling (Saunders et al., 2009). For example, purposive sampling is based on a judgmental approach, enabling the researcher to deliberately choose participants who are likely to provide valuable insights and comprehensive information necessary to achieve the overall aim of the research (Kvale, 2007; Creswell,

2009). In situations where identifying specific participants proves challenging, snowball sampling can be employed, allowing the researcher to expand the sample size through referrals from initial participants. Quota sampling is particularly effective for structured interviews and can yield results comparable to those obtained through probability sampling (Bryman and Bell, 2011). Similarly, convenience sampling prioritises the most accessible cases, often utilizing random selection methods (Bryman, 2016; Creswell, 2014; Saunders et al., 2016).

In consideration of the aforementioned scholarship insights, this study employed purposive sampling and snowball sampling techniques to recruit interview participants from a specific subset of the broader population, thereby facilitating the achievement of the research objectives (Kvale, 2007; Creswell, 2009). Notable scholars like Bryman (2016), Yin (2018), Creswell (2014) and Saunders et al. (2016) assert that qualitative research requires smaller, targeted samples to enable a more comprehensive exploration of the subject matter. This perspective underscores the notion that the focus should not solely be on the number of participants but rather on the richness and quality of the data obtained, which is essential for fulfilling the overarching aims of the study. Consequently, a deliberate selection of 25 research participants was made using a snowball sampling method for the interviews conducted in this research. The researcher organized the participants into the following groups: the federal government; state government; industry; academics; MDAs; ENGOs and local chiefs. Each of these participant groups plays a significant role in policy-making, strategic planning, operational execution, investment decisions, oversight or related decision-making processes concerning oil and gas exploration, development and environmental management in Nigeria. Furthermore, these participants were chosen due to their relevant experience and material knowledge, which align with the aims and anticipated outcomes of the research objectives. Therefore, these factors or considerations substantiate the rationale for employing purposive and snowball sampling techniques in this study.

5.5.2.3 Interview questions

Prior to embarking on the exploratory study and the subsequent fieldwork for data collection, the researcher diligently developed an interview guide. The supervisory team conducted a thorough review of the interview questions to identify and amend any areas of uncertainty or inconsistencies. This process was designed to eliminate any potential ambiguities or inappropriate content that may have been present in the initial draft, particularly concerning the sensitive issues of confidentiality and ethical considerations (Bryman, 2016). This proactive measure has been instrumental in ensuring that the interview questions not only meet the required academic standards but also align with the aims and objectives established in Chapter One of the research.

The interview questions were meticulously crafted to reflect an analytical framework grounded in the multi-level perspectives of transition processes, specifically focusing on regime dynamics, landscape influences, and niche innovations. The initial set of inquiries aimed to gauge participants' perceptions of the current EIA regime within Nigeria's oil and gas sector. This encompassed an evaluation of the existing EIA practices as a management response to the challenges arising from oil and gas operations in the Niger Delta region, an analysis of the institutional and regulatory framework governing EIA, as well as considerations of path dependencies and lock-in effects in environmental management. Additionally, the questions addressed the aspects of public consultation and stakeholder participation. Subsequent questions focused on the limitations associated with the current EIA practice in the oil and gas sector. Furthermore, the interview sought to assess participants' awareness and acceptance of a potential shift towards a more strategic approach, particularly as attention increasingly focuses on the exploration and development of new hydrocarbon frontiers in Nigeria. The following interview segment explored potential landscape influences or critical decision-making factors that could facilitate this strategic transition. The concluding section examined the prospects for the maturation of niche innovations and the emergence of SEA, including the identification of potential barriers that may hinder the advancement of a more strategic framework for oil and gas planning, regulation and development in Nigeria.

The interview questions were systematically designed to provide participants with the freedom to articulate their viewpoints, insights and experiences while the researcher maintained an attentive listening posture (Bryman, 2016). This adaptable methodology fostered an engaging dialogue, allowing for a structured progression through predetermined questions or a more spontaneous exploration of emerging themes during the interviews. Such an approach is consistent with Creswell's (2007) perspective that interview questions ought to thoroughly encompass participants' knowledge and experiences within an empowering environment.

5.5.2.4 Interview protocols

Qualitative research interviews are designed to collect high-quality and reliable data through direct interaction with participants. To achieve this objective, a thorough set of procedures for conducting research interviews was implemented. According to Creswell (2007), the process of conducting an interview consists of a series of systematic activities, as illustrated in Figure 5.1 below. In the context of this study, every phase of the outlined process was carefully implemented during the interview sessions with participants. Acknowledging the importance of each phase was essential for gathering credible and significant information that aligns with the overall research goals.

Before the commencement of the interview, the researcher was introduced to several potential participants through the results of an exploratory pilot scheme. This was facilitated by leveraging established contacts and employing a snowball sampling and opportunistic approach. The use of snowball sampling and opportunism proved essential in establishing connections with individuals from a diverse range of government organizations, departments, agencies, oil companies, internal development organisations, local chiefs and ENGOs. To initiate contact, the researcher dispatched introductory letters to schedule interviews and arrange subsequent meetings and discussions. Following this, the researcher took the necessary steps to secure an appropriate venue and ensure that all required recording equipment was available. This meticulous preparation was vital in conveying to the participants that the interviews would be recorded.

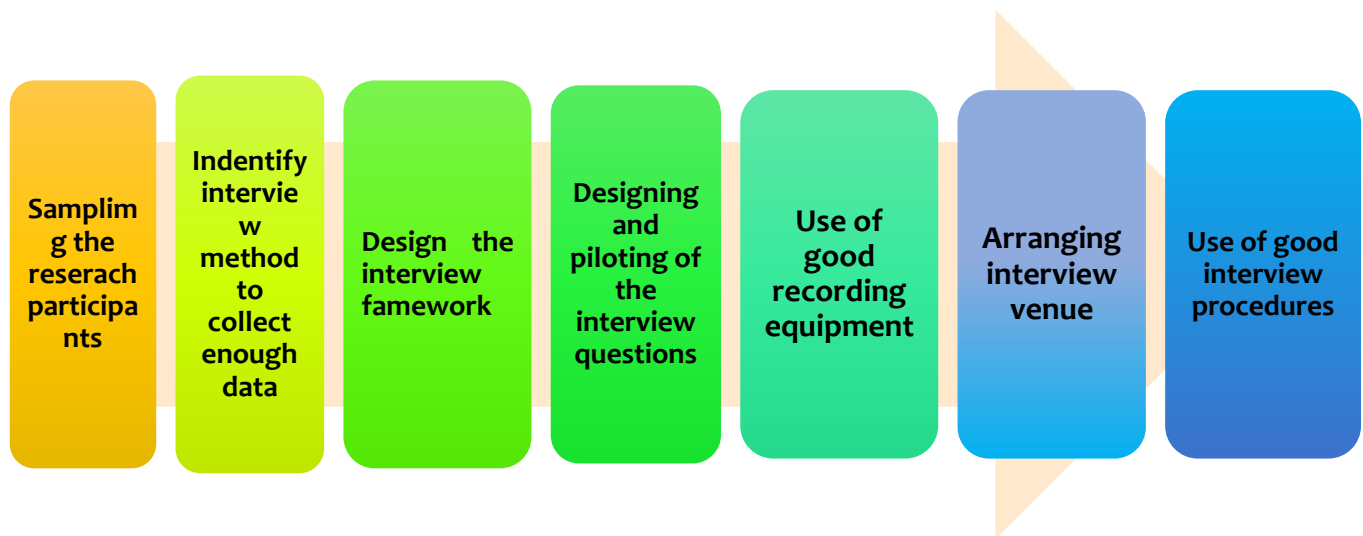
The subsequent phase entails establishing a supportive and comfortable environment for the research participants, which is essential for fostering rapport and enhancing the level of trust between the researcher and the participants. During the engagement segment of the interview, the researcher articulated the purpose of the discussion to the participants while also emphasizing the importance of consent and confidentiality. This was succeeded by the main interview session, where the researcher posed questions and facilitated dialogue, enabling participants to share their insights on a diverse array of topics outlined in the interview guide. This methodology was designed to allow the researcher to delve deeper into the participants' responses, seeking clarification and encouraging further elaboration on specific themes. By employing open-ended questions along with follow-up inquiries, the researcher aimed to draw out more nuanced responses and perspectives from the participants.

Furthermore, all interview sessions were documented through audio recordings to guarantee the electronic security of the data. A significant benefit of this recording process was the assurance that no segment of the conversation would be overlooked. As highlighted by Creswell (2014), the precise and prompt documentation of interview data is essential for maintaining the integrity of the information gathered in research. The use of recording devices allows the researcher to concentrate on identifying key themes as they arise without the need for continuous note-taking, thereby minimizing distractions during the sessions.

Finally, to adhere to a robust interview protocol, the researcher took steps to ensure that the concluding segment of each interview aligned with the predetermined schedule and included a summary of the key points discussed. This approach also provided interviewees with the opportunity to offer any final remarks. Following the completion of the interviews, the next phase involved transcribing the gathered data, which was essential for facilitating a thorough analysis. All interview sessions and their corresponding transcripts were electronically recorded and securely stored on the computer's hard drive to uphold transparency and safeguard data integrity. The researcher diligently organized, reviewed, and transcribed the collected information. To address potential biases in data management, NVivo software was utilized to upload all

pertinent information, thereby establishing a foundation for systematic data analysis. The use of NVivo proved to be beneficial, as it streamlined the processes of categorization, coding, and transcription of extensive data sets, effectively alleviating the manual difficulties associated with sorting and managing textual narratives.

Figure 5.1: Sequence of activity for conducting an interview



Sources: Author

5.5.2.5 Qualitative data analysis

This study used qualitative content analysis to analyze data derived from the semi-structure interviews. It is posited in the scholarship literature that creating meaning and making sense of textual information is the prime objective of qualitative data analysis. Miles and Huberman (1994: p. 10) assert that “the strengths of qualitative data rest on the competence with which their analysis is carried out”. This is partly because the textual nature of qualitative data necessitates a flexible yet meticulous approach to its analysis (Kvale, 2007). Therefore, in order to gain familiarity with the dataset, relevant textual data were systematically identified and recorded during the interview sessions, as well as throughout the transcription and verification process (Bryman, 2016). Before analyzing the data, themes and categories relevant to the multi-level perspective framework were identified from the literature review and developed into codes. The

three analytical levels of the MLP framework were considered and aligned with the notes obtained during the interview sessions. The themes related to the MLP framework are the prevailing EIA regime, landscape influences, and niche development. The identified codes, categories and themes were systematically reviewed in accordance with the MLP framework to reflect on the current EIA regime and explore the potential for transitioning towards the SEA approach in Nigeria's oil and gas sector. The following sections present a comprehensive overview of the stages utilized in the qualitative data analysis in this study.

5.5.2.5.1 Data structuring

During the data structuring, multi-stage processes were carefully followed. First, the data was transcribed and meticulously verified through repeated readings to ensure that relevant information was not missing. This approach significantly contributed to the substantial threshold of accuracy in data structuring. Next, the transcripts were coded using primary and secondary codes to effectively structure the data. The primary codes were derived from theoretical literature and the interview questions. Given the semi-structured nature of the interviews, additional information emerged that was not anticipated in the initial questions or theoretical framework, necessitating the development of secondary codes. The transcribed interviews were then systematically coded in a more coherent pattern, incorporating codes from the theoretical framework, interview questions and newly developed codes specific to the transcripts to establish an overarching impression of the data collected (Yin, 2018; Saunders et al., 2016). This approach is particularly valuable in qualitative research, as it provides the flexibility to adapt to the evolving insights that emerge from the data while maintaining the rigour needed to ensure the reliability and validity of the findings. During the coding process, particular combinations of codes were employed, such as policy window, learning, expectations and other similar concepts, which were grouped under the same code. This approach facilitated the identification of relationships between the codes and allowed for the development of more conceptual and abstract codes (Silverman and Patterson, 2024). The MLP framework developed by Geels (2002) was utilized to guide the identification of these coding combinations. Once all transcripts were coded, the codes

were thoroughly evaluated and systematically recorded, ensuring a comprehensive analysis of the data.

5.5.2.5.2 Identification of key codes

The preliminary stage of coding that translates data into codes is commonly referred to as open coding or initial coding. This process often involves analysis, which involves the foundational identification of categories along with their associated characteristics (Bryman, 2016). In this research, the identification of key codes was an intensive process that involved systematically searching for patterns, sequences, relationships, associations and meanings both within and between the identified codes. In order to ensure reliability and accuracy, the most commonly used codes from the interview sessions were identified and corroborated by re-reading the transcripts and compiling a list of principal codes. This meticulous method enabled the categorization of the data based on the frequency of critical codes, effectively streamlining and reducing the complexity of the data. At this phase, several codes were eliminated due to their low frequency across the transcriptions, as they were deemed not to meet the criteria of relevance when benchmarked against the research objectives. In particular, codes that appeared at least fewer than four times throughout the transcripts were excluded from further analysis. This filtering process ensured that only the most pertinent codes were retained, enhancing the overall coherence and focus of the data analysis.

5.5.2.5.3 Identification of main themes

At this stage, the researcher focus on ensuring that themes are appropriately assigned according to the established categories, thereby facilitating the identification of the key elements derived from the interview sessions. The coding process enables the researcher to integrate codes and categories into coherent themes. Furthermore, the combinations of codes provide a framework for analyzing the interconnections between themes and categories from a multi-level perspective. For instance, the prospects of transitioning from project-level assessments to a strategic-level approach in Nigeria's oil and gas sector became even more apparent when the categories were synthesised into themes. This process involves identifying critical decision-making factors and transition pathways, as well as developing a framework that illustrates the scenario of such a transition.

5.5.2.5.4 Data interpretation

The data interpretation involved identifying recurring themes as well as highlighting both similarities and differences within the data, which were subsequently organized into combined categories. These categories, along with the primary themes, facilitated the formulation of key findings that ultimately contributed to the results. The interpretation of the data was grounded in the main themes, alongside the integration of principal categories, which allowed for the conclusion of various factors and their interrelationships. The summarization of the data drew upon themes derived from interview sessions while also incorporating the identified multi-level perspective levels, which encompass the existing EIA regime, landscape influences and niche development. In order to ensure the retention of the content and essence of the information during the summarization process, a significant amount of detail and contextual data was incorporated into the summary presented in the findings.

5.6 Secondary data used in this study

The use of secondary data sources played a crucial role in acquiring comprehensive and significant information representing some of this research's less visible dimensions. Researchers such as Yin (1994) and Dul and Hak (2008) have emphasized the importance of secondary sources, which encompass both published and unpublished government documents, reports, academic journal articles, pertinent books and papers from conferences and workshops in qualitative research that is contextualised with a case study design. By harnessing these resources, a deeper insight into the phenomenon under investigation can be achieved. Accordingly, this study used documentary analysis to gather evidence through a thorough examination of various documents, including journals, books, digital files and online archives. These materials pertain to environmental assessments or EIA guidelines and regulations relevant to oil and gas exploration and official reports concerning environmental management in the Nigerian oil and gas industry. These documents were accessed from reputable sources, including the official websites of government organizations such as the Federal Ministry of the Environment, the Federal Ministry of Petroleum Resources, the Nigerian National Petroleum Corporation, the Department of Petroleum Resources and the Niger Delta Development

Commission. This approach ensured the acquisition of reliable and precise documents, with each source frequently leading to the identification of additional valuable resources.

5.7 Ethical considerations

Kitchener (2000) asserts that ethics in research serves as the moral compass that guides researchers in their data-collection process and exercise. Ethical considerations encompass the notions of right and wrong, good and bad, in tandem with widely established principles and guidelines. Within the realm of research, ethical considerations focus on the formulation of rules for researchers, the evaluation and review of research activities, and the implementation of credible and acceptable standards to ensure adherence to ethical principles throughout the research process (Sieber, 1992; Saunders, 2008). The fundamental objective of ethics is to ensure that researchers are perceived as committed to morally acceptable practices, refraining from actions deemed unethical.

Denscombe (2002) emphasizes that researchers should strive to ensure that ethical considerations serve as a means to achieve research objectives within an environment characterized by mutual respect and understanding, free from any form of manipulation. This underscores the importance of fostering a respectful and transparent environment, particularly in avoiding deceptive practices or withholding information from participants, which are considered unethical, regardless of whether the potential benefits outweigh the possible risks to study participants. Research conducted in higher education institutions generally necessitates the approval of an institutional review board (IRB) before collecting empirical data (Sieber, 1992). Professional and ethical standards were adhered to for this research. For instance, the researcher obtained approval from the Newcastle University Research Ethics Committee (HaSS REC) and the National Health Research Ethics Committee (NHREC) in Nigeria. This approach was designed to minimize unforeseen harm and physical discomfort during the research process.

5.7.1 Questionnaire's ethics in quantitative research

This research employed a questionnaire to gather quantitative data from participants. Denzin and Lincoln (2011) emphasize the importance of respecting participants'

autonomy when collecting information via questionnaires. In essence, this means that the survey must be conducted in accordance with ethical standards that align with best practices. However, it is argued that this data collection method is associated with various ethical considerations such as confidentiality and anonymity (Denscombe, 2002; Saunders, 2008). To address these ethical concerns, informed consent was obtained from participants by clearly articulating the study's nature and objectives. The principle of informed consent reflects the participants' autonomy and must be obtained without any form of influence, manipulation, or coercion (Bryman, 2004). The consent form was designed to be clear, concise, and easily understandable for the respondents, explicitly outlining their right to participate voluntarily and their ability to withdraw from the study at any point. To further clarify the research's purpose and its potential benefits, cover letters were included with the questionnaire. These letters aimed to reinforce the voluntary nature of participation and assured respondents that their identities and confidentiality would be safeguarded throughout the research process and thereafter.

Denzin and Lincoln (2011) emphasize that it is the primary duty of the researcher to safeguard the anonymity and confidentiality of research participants during the data collection process, both during and after the study. To uphold this responsibility, the researcher employed a questionnaire design, which afforded the respondents a degree of anonymity. In cases where telephone numbers, names and contact details of potential participants were acquired from their respective organizations, such sensitive information was promptly removed, and a code was assigned to each questionnaire. This procedure was implemented for two key reasons: to protect the identities of the participants and to ensure that informed consent was obtained, either in written form or via email, from the prospective respondents prior to the distribution of the questionnaire.

5.7.2 Interview ethics in qualitative research

Qualitative data collection was used in this study. Qualitative information was obtained from the federal government; state government; industry; environmental experts/academics; MDAs; ENGOs and local chiefs. Each of these participant groups plays a significant role in policy-making, strategic planning, operational execution, investment

decisions, oversight or related decision-making processes concerning oil and gas exploration, development and environmental management in Nigeria. The participants in this study were asked key questions relevant to the prospects of a transition from project-level assessment to a strategic-level approach in Nigeria's oil and gas environmental management regime. In preparation for the interviews, a draft of the informed consent form was distributed to the potential research participants. This process is grounded in ethical principles that mandate the protection of participants from any form of harm during the data collection phase (Creswell, 2011). The researcher implemented a comprehensive array of precautionary measures aimed at minimizing or completely eliminating risks, including both physical and emotional harm to the participants (Johannesson et al., 2014). Furthermore, in accordance with established research protocols, it was imperative for the researcher to communicate the purpose, significance and rationale behind the study to the participants. Consequently, consent was sought from the research participants to engage in the interviews, which included the assurance of their right to withdraw from the study at any point without facing any negative consequences (Bryman, 2008). This right was applicable to any sensitive topics or themes that the participants might find uncomfortable to address.

In relation to privacy, the researcher obtained consent from the interviewees to use an audio recording device to record their insights and viewpoints while emphasising that their identities would remain confidential. Furthermore, to foster a sense of comfort and assurance among the research participants, they were informed of their right to discontinue the recording at any point during the interview if they so desired. This approach is consistent with participation, privacy, and anonymity principles, which are essential for addressing the ethical considerations inherent in qualitative research. It indicates that the confidentiality assurances outlined in the informed consent document were respected and upheld during and after the research process. This method was crucial in building trust with the participants throughout the study.

5.7.3 Ethics in gathering secondary data

Research does not always require the collection of data directly from individuals. A considerable amount of data can be effectively obtained by examining documents and

other relevant information management systems. While the fundamental ethical considerations surrounding the secondary use of research data remain constant, they have gained urgency with the emergence of new technologies. The processes of sharing, compiling and storing data have become significantly more efficient, which raises new concerns regarding data confidentiality and privacy. Thus, the use of secondary data in the era of fast-evolving information presents notable ethical challenges. Fielding and Fielding (2003) assert that the use of secondary information is, in itself, an ethical exercise, and the extraction of information from relevant documents often requires sensitivity towards various organizations and agencies in diverse contexts. To navigate these challenges effectively, researchers must adhere to moral and legal standards to safeguard the confidentiality of any data utilized (Creswell, 2011). The data obtained in this study was collected from documents in accordance with established ethical referencing standards.

5.8 Chapter Summary

This chapter delineates the research design and methodology employed in this study. It elaborates on how the pragmatic philosophical paradigm influenced the researcher's selection of a mixed-method research approach framed within a case study design. The chapter further examines the data collection techniques employed, detailing both quantitative and qualitative methods, sampling techniques and approaches to data analysis and interpretation. It emphasizes how the integration of these methodologies facilitated the extraction of profound and nuanced insights within the selected case study, creating a synergy that leveraged strengths while addressing potential limitations. By utilizing both quantitative and qualitative methods, the researcher was able to distribute two distinct survey questionnaires: one for communities that live in the old frontier areas of oil and gas exploration and development in the Niger Delta region and one for EIA practitioners. In-depth interviews with policy-makers, industry, environmental NGOs, local chiefs, academics and representatives from the multi-lateral development organisations were also conducted. This convergent mixed-method approach was instrumental in enabling the researcher to achieve the study's aims and objectives. The chapter concludes by underscoring the essential research ethics that guided the researcher throughout the research process.

CHAPTER SIX

Community Questionnaire Analysis and Results

6.1 Introduction

This chapter presents the quantitative findings that were established through analysis of the community questionnaire survey. The survey was designed to gain insights into the impact of oil and gas exploration and production on the environment and livelihoods in the Niger Delta region, the centrality of EIA to oil and gas environmental decision-making and the roles of relevant actors in environmental management. Furthermore, the survey examined whether compensation has been provided to local inhabitants for material damage to their livelihoods due to oil and gas extraction, production and operations in the Niger Delta region. The survey data was coded in Microsoft Excel and analysed using the SPSS statistical software and STATA Statistical Software version 17.

6.2 Demographic information of respondents

In order to explore the perceptions of the respondents regarding the impact of hydrocarbon exploration and production on the environment and livelihoods, the centrality of EIA to oil and gas environmental management, public participation as well as the roles of relevant actors in environmental management, it is imperative to consider certain demographic variables. Thus, the first part of the community questionnaire used in this research focused on gathering demographic information. The respondents were asked different demographic questions in order to record the participants' gender, occupation, formal employment status, land ownership, residency period and educational qualifications. This information was used to develop the demographic composition of the respondents that have participated in this study and served as independent variables to assess whether these characteristics influenced their perspectives on the themes that underpinned the survey.

Table 6.1: Demographic analysis of the respondents

		Number (N)	Percentage (%)
Gender	Female	105	31.0
	Male	233	69.0
	Prefer not to say	0	0.0
Total		338	100.0
Occupation	Artisanship	24	7.1
	Farming	98	29.0
	Fishing	145	42.9
	Trading	60	17.8
	Others	11	3.3
Total		338	100.0
Employment	Employed	57	16.1
	Unemployed	281	83.9
Total		338	100.0
Land ownership	Yes	277	82.0
	No	61	18.0
Total		338	100.0
Residency period	Less than One year	7	2.1
	1 – 5 years	20	5.9
	6 – 10 years	30	8.9
	11 – 15 years	78	23.1
	16 – 20 years	85	25.1
	Over 20 years	118	34.9
Total		338	100.0
Educational qualifications	First School Certificate	108	32.0
	SSCE	85	25.1
	OND	54	16.0
	HND	44	13.0
	BSc	28	8.3
	Postgraduate	19	5.7
Total		338	100.0

As highlighted in Table 6.1 above, 69 per cent of the respondents were male and 31 per cent female. It is also apparent from the demographic analysis that 83.9 per cent of the respondents were not formally employed, with many relying on fishing and farming for their livelihoods. Regarding the residency period, 73 per cent of the respondents had

lived in the study area for over a decade, indicating a long-term environmental attachment or connection to the Niger Delta region. Furthermore, 82 per cent of the respondents were landowners, reflecting significant property ownership within the groups. Educational backgrounds or attainment varied among the participants, with only 5.7 per cent holding postgraduate qualifications, while more than one-quarter did not progress beyond secondary school.

6.3 Oil spill occurrences

The second item in the questionnaire is about oil spill occurrences in the Niger Delta region. The survey respondents were asked about the number of oil spills they had witnessed in their locality between 2002 and 2022. The results in Figure 6.1 show that 63 per cent of respondents reported experiencing more than 30 oil spill incidents in the specified timeframe. In contrast, around 4 per cent of the respondents witnessed a lower range of 1-5 oil spills during the same period. Overall, the findings reveal that almost 90 per cent of the respondents confirmed having witnessed oil spills in their oil- and gas-rich communities. However, it is important to note that the actual number of oil spills that the respondents in the oil-producing communities may have experienced could be significantly higher than reported, as some spills may go unnoticed since the greater part of the Niger Delta region is characterised by challenging terrain of the swampy mangrove forest.

Figure 6.1: Number of oil spill occurrences

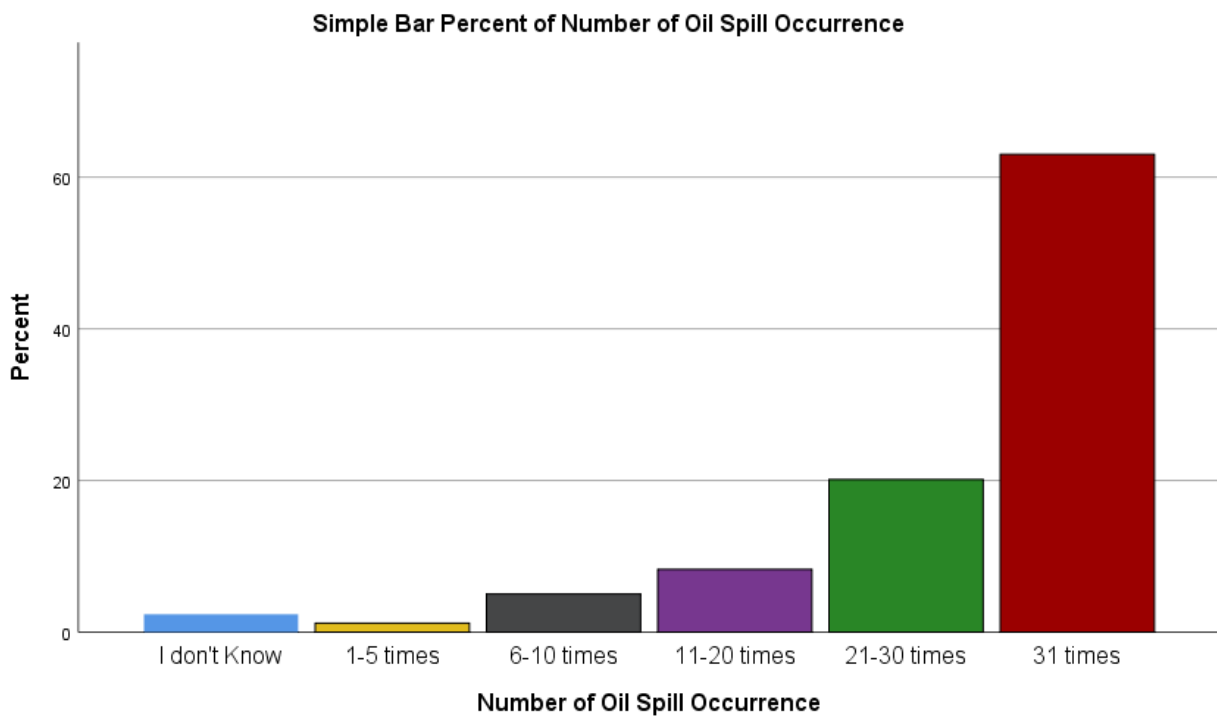


Figure 6.1: Bar chart showing per cent of oil spill occurrences

A Kruskal-Wallis H test was conducted to determine if any demographic characteristics of the respondents may influence their perspectives on the oil spill occurrences in the study area. The non-parametric test was selected due to the Likert-scale nature of the survey, the presence of outliers in the distribution groups, the distribution of the groups moving in the same direction and the failure of the data to pass the Shapiro-Wilk test of normality. A summarised result of the H-test is presented in Table 6.2 below.

Table 6.2: Summary of Kruskal-Wallis test for oil spill occurrences

Response variables	Test statistic (H)	Degree of freedom	P-value
Occupation	258.923	6	0.000
Residency period	303.256	5	0.000
Level of education	280.437	5	0.000

As shown in Table 6.2 above, all response variables produced statistically significant results ($p < .05$). A Mann-Whitney U test was conducted to explore differences within the groups based on gender, formal employment, and land ownership. The results indicate that the mean rank for females (87.85) was significantly different from that for males (206.29), $U = 20805.500$, $z = 12.014$, $p = .000$. Similarly, employed respondents (mean rank 34.96) differed significantly from unemployed respondents (mean rank 196.79), $U = 15677.00$, $z = 13.282$, $p = .000$. Landowners (mean rank 155.74) also showed significant differences compared to non-landowners (mean rank 232.00), $U = 12261.000$, $z = 6.429$, $p < 0.001$. These findings suggest that female respondents, employed individuals, and landowners have significantly higher perspectives on the variable than their counterparts. Pairwise comparisons showed that all pairs were significant except for artisan/employed and fishing/others, with adjusted p-values of 0.287 and 0.605, respectively. The differences in response variables suggest that respondents are less conservative in their opinions regarding circumstances around them, with significance values adjusted by the Bonferroni correction for multiple tests.

6.4 Degree of oil spillage

The survey respondents were asked to rate the severity of oil spills in the Niger Delta region, ranging from moderate to high. As depicted in Figure 6.2, over 90% of the respondents perceived the severity of oil spills as very high. This shared perspective on the severity of the oil spill to be very high must have reflected the frequent and widespread nature of oil spills occurring in the oil-producing communities, as noted in the preceding section.

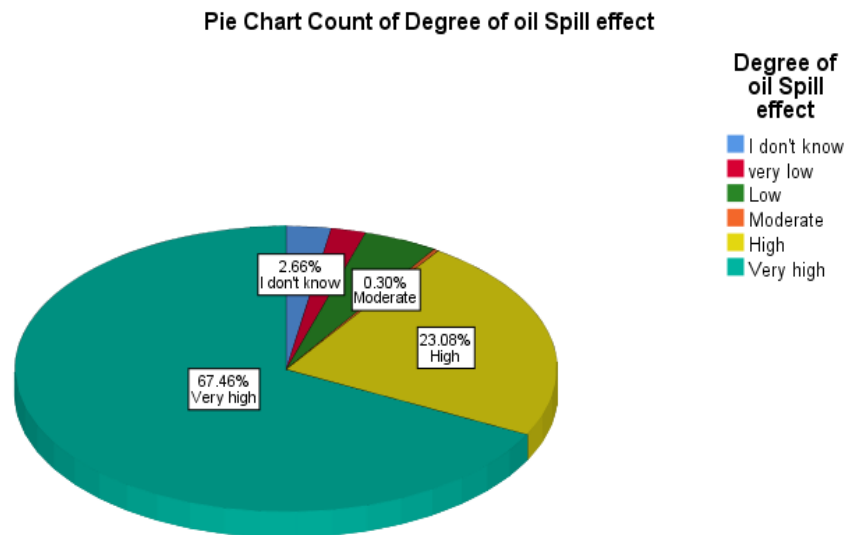


Figure 6.2: Pie chart showing responses on the severity of the oil spillage

To further explore the survey responses, the Kruskal-Wallis test, a rank-based non-parametric measure was used to identify any statistically significant differences within the groups of independent variables among participants' ordinal responses. Although other statistical tests, such as the t-test and ANOVA (Analysis of Variance), were available for data analysis, their effectiveness depends on meeting four key assumptions: normally distributed sampling distribution, homogeneity of variance, independence and interval data. However, the dataset collected for this study did not meet these criteria, particularly as parametric tests are less effective when dealing with non-normally distributed data or Likert-scale responses.

Table 6.3: Summary of Kruskal-Wallis test for degree of oil spillage

Response variables	Test statistic (H)	Degree of freedom	P-value
Occupation	301.878	6	0.000
Residency period	272.747	5	
Level of education	297.035	5	

As illustrated in Table 6.3, all response variables produced statistically significant results ($p < .05$). A Mann-Whitney U test was also conducted to explore differences in gender, formal employment and land ownership groups. The results indicated statistically significant differences: females had a higher mean rank (84.09) compared to males (207.99), $U = 21,201.000$, $z = 11.629$, $p = .000$; employed respondents had a higher mean rank (82.05) compared to unemployed respondents (187.24), $U = 12,993.000$, $z = 7.988$, $p < .000$; and landowners had a higher mean rank (140.41) compared to non-landowners (301.59), $U = 16,506.000$, $z = 12.571$, $p = .000$.

These findings suggest that perspectives on the attribute were significantly higher among females, employed individuals and landowners than their counterparts. Pairwise comparisons showed that all pairs were significant, except for fishing/traders and fishing/others, with adjusted p-values of 0.553 and 0.526, respectively. The differences in these response variables imply that these groups are less conservative in their opinions concerning circumstances around them, with significance values adjusted using the Bonferroni correction for multiple tests.

6.5 Causes of oil spillage

One of the most important items in the community questionnaire is the inquiry about the causes of oil spillage in the Niger Delta region. As shown in Table 6.4 below, the respondents indicated that the causes of oil spillage can be attributed to a complex interplay of several factors rather than a single causal factor.

Table 6.4: Causes of oil spill

Factors	I don't know	Strongly disagree	Disagree	Neutral agree	Agree	Strongly
Pipelines rupture	14/4.1%	34/10.1%	26/7.7%	12/3.6%	84/24.9%	168/49.7%
Vandalism/sabotage	8/2.4%	55/16.3%	29/8.6%	11/3.3%	72/21.3%	163/48.2%
Natural disaster	28/8.3%	66/19.5%	56/16.6%	30/8.9%	76/22.5%	82/24.3%
Blowout	13/3.8%	37/3.8%	27/8.0%	21/6.2%	71/21.0%	169/50.5%

Table 6.5: Summary of Kruskal-Wallis test for causes of oil spillage

Response variables	Causes of oil spillage	Test statistic (H)	Degree of freedom	P-value
Occupation	Pipelines rupture	307.542	6	0.000
	Vandalism/sabotage	303.179		
	Natural disaster	305.626		
	Blowout	304.553		
Residency period	Pipelines rupture	290.648	5	0.000
	Vandalism/sabotage	309.245		
	Natural disaster	305.349		
	Blowout	278.200		
Level of education	Pipelines rupture	279.841	5	0.000
	Vandalism/sabotage	312.976		
	Natural disaster	309.936		
	Blowout	309.034		

As presented in Table 6.5 above, the response variables yielded statistically significant results ($p < .05$). A Mann-Whitney U test was conducted to explore group differences in relation to causes of oil spillage across gender, formal employment and land ownership. The results indicated that the mean ranks for females (84.77, 80.89, 85.85, 89.30) were significantly different from those of males (207.68, 208.88, 207.20, 203.36), with U-values ranging from 21,129.500 to 20,233.500, z-values from 10.456 to 11.653, and p-values of .000. Similarly, employed respondents had significantly higher mean ranks (197.50, 196.95, 197.12, 193.62) compared to the unemployed (31.46, 31.68, 33.33, 40.58), with U-values between 15,129 and 15,877, z-values from 11.368 to 12.667, and p-values of .000. Landowners also had significantly higher mean ranks (252.50, 270.00, 273.00, 301.58) compared to non-landowners (151.22, 147.12, 146.71, 139.91), with U-values between 13,511.500 and 15,537, z-values from 7.935 to 12.010, and p-values less than 0.001.

These findings imply that males, employed individuals and landowners hold stronger views on the causes of oil spillage than their counterparts. Pairwise comparisons showed that all pairs were significant, indicating that these groups are less conservative in their opinions about circumstances

surrounding oil spillage. Significance values were adjusted using the Bonferroni correction for multiple tests.

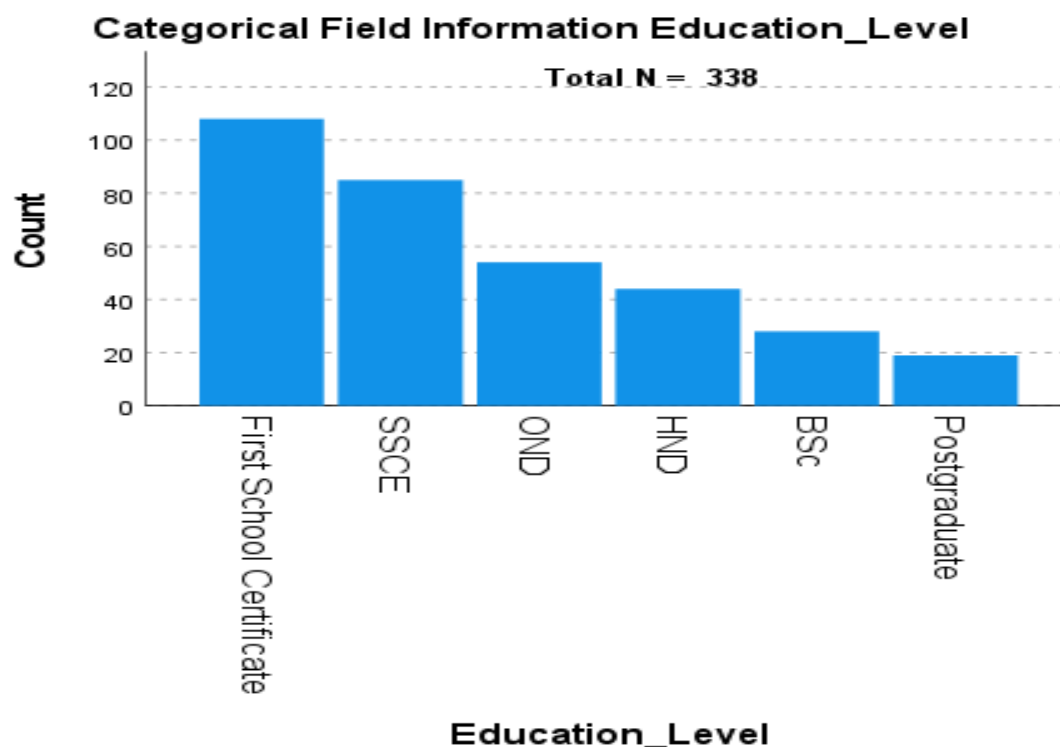


Figure 6.3: A bar chart showing the level of education of the respondents

As illustrated in Figure 6.3 above, 32.0 per cent of the respondents hold a First School Certificate, and 25.1 per cent have an SSCE, while those with postgraduate qualifications are the least represented. This suggests that the participants in the study area generally have a low level of education, which may partly contribute to the high incidence of vandalism and sabotage—key factors in oil spills in the Niger Delta region.

6.6 Category of the negative impact of oil and gas activities

Another important item in the questionnaire is the inquiry about the category of the negative impact associated with oil and gas activities in the Niger Delta region. Table 6.6 below highlights variations in mean scores across different categories of negative effects related to hydrocarbon exploration and development, revealing respondents' distinct perceptions regarding this item in the questionnaire. Direct effects received the highest mean score of 4.21 and the lowest standard deviation (1.088), indicating strong consensus among respondents about the immediate and visible consequences of oil and

gas exploration and production. Indirect impacts, which typically emerge over time following the direct effects, ranked second with a mean score of 3.32. In contrast, cumulative impacts—those that occur later or at a greater distance—were perceived as less concerning, reflected in the lowest mean score of 2.61.

Furthermore, the results shown in Table 6.6 below reveal that the direct and indirect impacts of oil and gas activities resonate more prominently with the surveyed population in the oil-producing communities. However, the interview results indicate that cumulative impacts, rather than direct or indirect effects, are predominantly associated with oil and gas drilling activities in the Niger Delta region.

Table 6.6: Category of negative impact of oil and gas activities

Categories of impacts	N	Mean	Std. Deviation
Direct impact	338	4.21	1.088
Indirect impact	338	3.32	1.137
Cumulative impact	338	2.61	1.054

Note: 5: very often. 4: often. 3: neutral. 2: rarely. 1: never. 0: I don't know

To further examine the survey responses for perceptions regarding direct, indirect and cumulative impacts across various occupations, a Kruskal-Wallis test was conducted. The results in Table 6.7 below show that all response variables produced statistically significant results ($p < .05$).

Table 6.7: Kruskal-Wallis test for the category of negative impact of oil and gas activities across occupations

Categories of impacts	Test statistic (H)	Degree of freedom	P-value
Direct impact	291.920	6	0.000
Indirect impact	309.431		
Cumulative impact	282.991		

Moreover, a Jonckheere-Terpstra test was conducted to explore opinions on direct, indirect and cumulative impacts across various occupations. The results indicate that the

mean rank values for direct impacts ($J-T = 39650.500$, $z = 17.726$, $p = .000$), indirect impacts ($J-T = 46984$, $z = 19.032$, $p = .000$) and cumulative impacts ($J-T = 40776$, $z = 18.501$, $p = .000$) are statistically significant. This suggests that the perspectives on direct, indirect and cumulative impacts are notably higher across different occupations. The pairwise comparison further confirmed that all pairs are significant, highlighting variations in opinions among professions. The significance of these differences indicates that respondents are less conservative in their views regarding the impacts of oil and gas activities, with values adjusted using the Bonferroni correction for multiple tests.

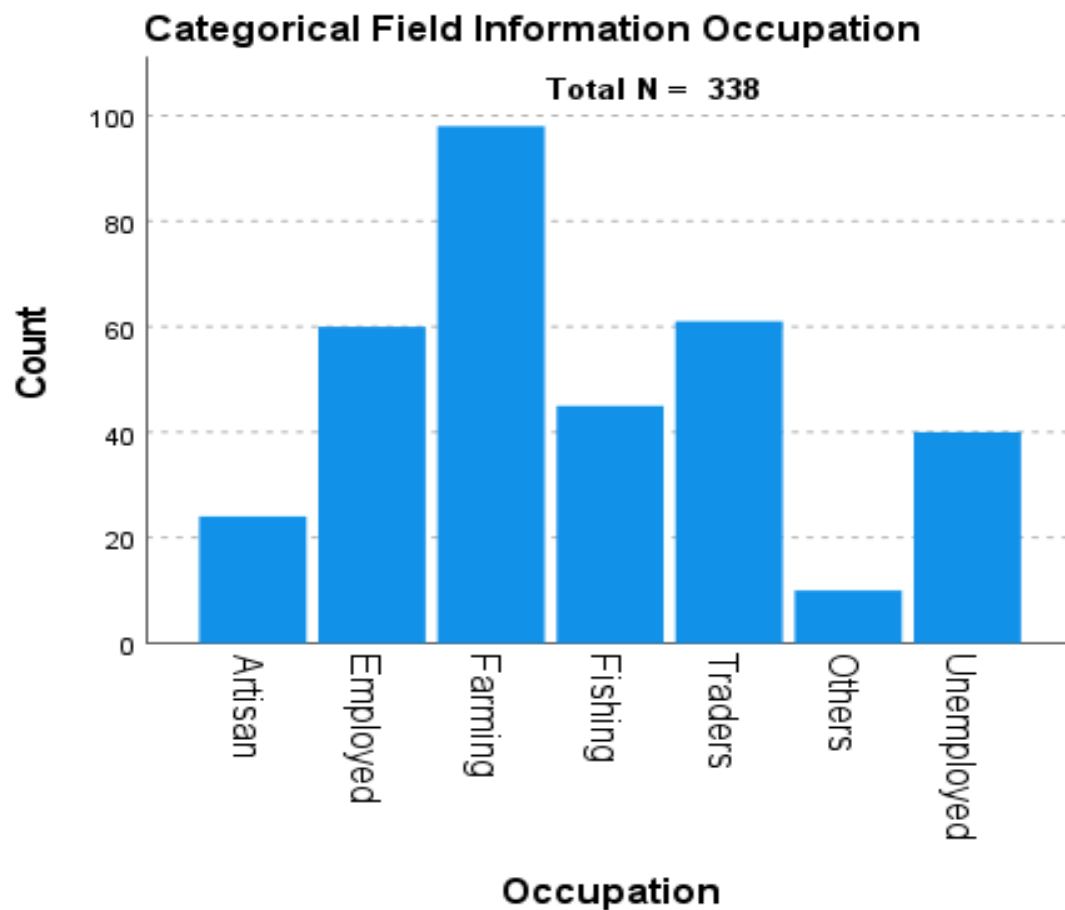


Figure 6.4: A bar chart of the occupation of the respondents

As shown in the graph above, most respondents are engaged in fishing 42.9 per cent and farming 29.0 per cent activities within the study area. In contrast, artisans and those in other occupations represent the smallest groups. This suggests that despite the ongoing manifestations of a wide range of negative impacts associated with oil and gas activities, the predominant livelihoods of participants in the study area remain rooted in farming and fishing.

6.7 Environmental impacts of oil and gas exploration and production

The participants were asked about the environmental impacts of oil and gas exploration and production in their locality. Table 6.8 reveals that 61.3 per cent of respondents expressed concerns about air pollution resulting from the operations of oil companies, while 77.8 per cent were worried about water quality. Additionally, 62.5 per cent highlighted that chemical discharges and gas flaring associated with hydrocarbon extraction contaminate water sources, contributing to public health issues. Moreover, 63.6 per cent of respondents acknowledged the adverse impact of oil and gas drilling activities on biodiversity in the study area. A cursory examination of the results tabulated in Table 6.8 reveals the enormity of the environmental impacts of oil and gas exploration and production in the Niger Delta region.

Table 6.8: Environmental impacts of oil and gas activities (Frequency/Percentage)

S/N	Environmental impacts	I don't know	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Air quality	13/3.8%	58/17.2%	37/10.9%	23/6.8%	75/22.2%	132/39.1%
2	Water quality	12/3.6%	32/9.5%	17/5.0%	14/4.1%	124/36.7%	139/41.1%
3	Soil quality	25/7.4%	37/10.9%	39/11.6%	28/8.8%	88/26.0%	121/35.8%
4	Health	12/3.6%	56/16.6%	40/11.8%	19/5.6%	79/23.4%	132/39.1%
5	Biodiversity	14/4.1%	38/11.2%	34/10.1%	37/10.9%	106/31.4%	109/32.2%
6	Noise pollution	15/4.4%	47/13.9%	85/25.1%	27/8.0%	79/23.0%	85/25.0%
7	Nuisance odour	14/4.1%	58/17.2%	70/20.0%	12/3.6%	55/15.3%	129/38.2%
8	Climate change	13/3.0%	54/16.0%	50/14.8%	20/5.9%	19/26.9%	110/32.5%
9	Crime rate	13/3.8%	38/9.2%	53/15.7%	141/41.7%	64/18.9%	36/10.7%

The Kruskal-Wallis test was conducted to examine the survey responses for perceptions of environmental impacts associated with oil and gas activities across different occupations. The results in Table 6.9 below show that all variables produced statistically significant results ($p < .05$).

Table 6.9: Summary of Kruskal-Wallis test for environmental impact of oil and gas activities across occupations

Activities	Test Statistic (H)	Degree of freedom	P-value
Air quality	309.595	6	0.000
Water quality	270.046		
Soil quality	309.393		
Health	296.151		
Biodiversity loss	308.799		
Noise pollution	313.500		
Nuisance odour	312.305		
Climate change	312.819		
Crime rate	275.115		

In addition, a Jonckheere-Terpstra test was conducted to examine perceptions of environmental impacts associated with oil and gas activities across different occupations. The findings confirmed that the median rank values for various environmental concerns, such as air quality, water quality, soil quality, health-related problems, biodiversity loss, noise pollution, climate change, and crime rate, were all statistically significant, with p-values of .000. This suggests a strong consensus among respondents regarding these impacts. However, the perception of nuisance odour, though statistically significant, had a lower median rank value (2.00). The pairwise comparison indicated that all occupational groups were significantly different, except for the fishing/others category, which had an adjusted p-value of 0.068. Overall, the results suggest that respondents are less conservative in their opinions concerning environmental and social issues in the study area, with significance values adjusted by the Bonferroni correction for multiple tests.

6.8 Socio-economic implications and environmental effects of oil and gas activities

The survey participants were asked to give their opinions on the socio-economic implications and environmental effects of oil and gas activities. As shown in Table 6.10, 64.7 per cent of respondents reported that oil and gas drilling adversely affected their fishing activities, while 58.2 per cent stated that oil exploration had impacted their farmland — both critical sources of livelihood in the oil-producing communities of the Niger Delta. Accordingly, it can therefore be deduced that the contamination of water and coastal marine environment due to the operations of the oil companies have damaging impacts on food security in the study area. Conversely, respondents indicated that the cultural landscape, a significant aspect of the community's social life, has not been significantly affected by oil and gas activities. A detailed summary of responses is presented in Table 6.10 above.

Table 6.10: Effects of oil and gas activities on socio-economic (%)

S/N	Indicators	I don't know	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Farming	10.1%	6.5%	14.2%	10.9%	18.6%	39.6%
2	Fishing	1.8%	0.3%	1.8%	31.4%	25.1%	39.6%
3	Other economic activities	1.8%	14.2%	12.7%	1.2%	28.4%	41.7%
4	Cultural landscape	2.7%	5.3%	39.6%	13.0%	17.2%	22.2%
5	Well-being	10.1%	6.5%	14.2%	10.9%	18.6%	39.6%

To further examine the survey responses for perceptions regarding the socio-economic implications and environmental effects of oil and gas activities across different occupations, the Kruskal-Wallis test was conducted. The results in Table 6.11 below show that all response variables produced statistically significant results ($p < .05$).

Table 6.11: Summary of Kruskal-Wallis test for the impact of oil and gas activities on socio-economic

Indicators		Test statistic (H)	Degree of freedom	P-value
Farming	Occupation	290.623	6	0.000
	Formal employment	151.392	1	
	Level of education	263.587	5	
Fishing	Occupation	302.577	6	0.000
	Formal employment	140.935	1	
	Level of education	268.589	5	
Other economic activities	Occupation	288.371	6	0.000
	Formal employment	67.188	1	
	Level of education	282.442	5	
Cultural landscape	Occupation	295.962	6	0.000
	Formal employment	117.164	1	
	Level of education	315.021	5	
General well-being	Occupation	306.398	6	0.000
	Formal employment	95.053	1	
	Level of education	324.061	5	

A Jonckheere-Terpstra test was further conducted to examine the socio-economic implications and environmental effects of oil and gas activities across different occupations. The analysis revealed statistically significant median rank values (4.00) for farmland (J-T = 39477.500, $z = 17.575$, $p = .000$), fishing activities (J-T = 39715, $z = 17.815$, $p = .000$), other economic activities (J-T = 6207.500, $z = -18.130$, $p = .000$), cultural landscape (J-T = 4907.500, $z = -19.218$, $p = .000$), and overall well-being (J-T = 2845, $z = -20.722$, $p = .000$). These findings suggest a strong perception of these impacts among respondents within their respective occupations. Pairwise comparisons showed significant differences across most groups, except for farming/artisan and fishing/farming pairs, with adjusted p-values of 0.091 and 0.082, respectively. Overall, the significance of these differences implies that respondents are less conservative in their opinions about the impacts on their livelihoods, with significance values adjusted by the Bonferroni correction for multiple tests.

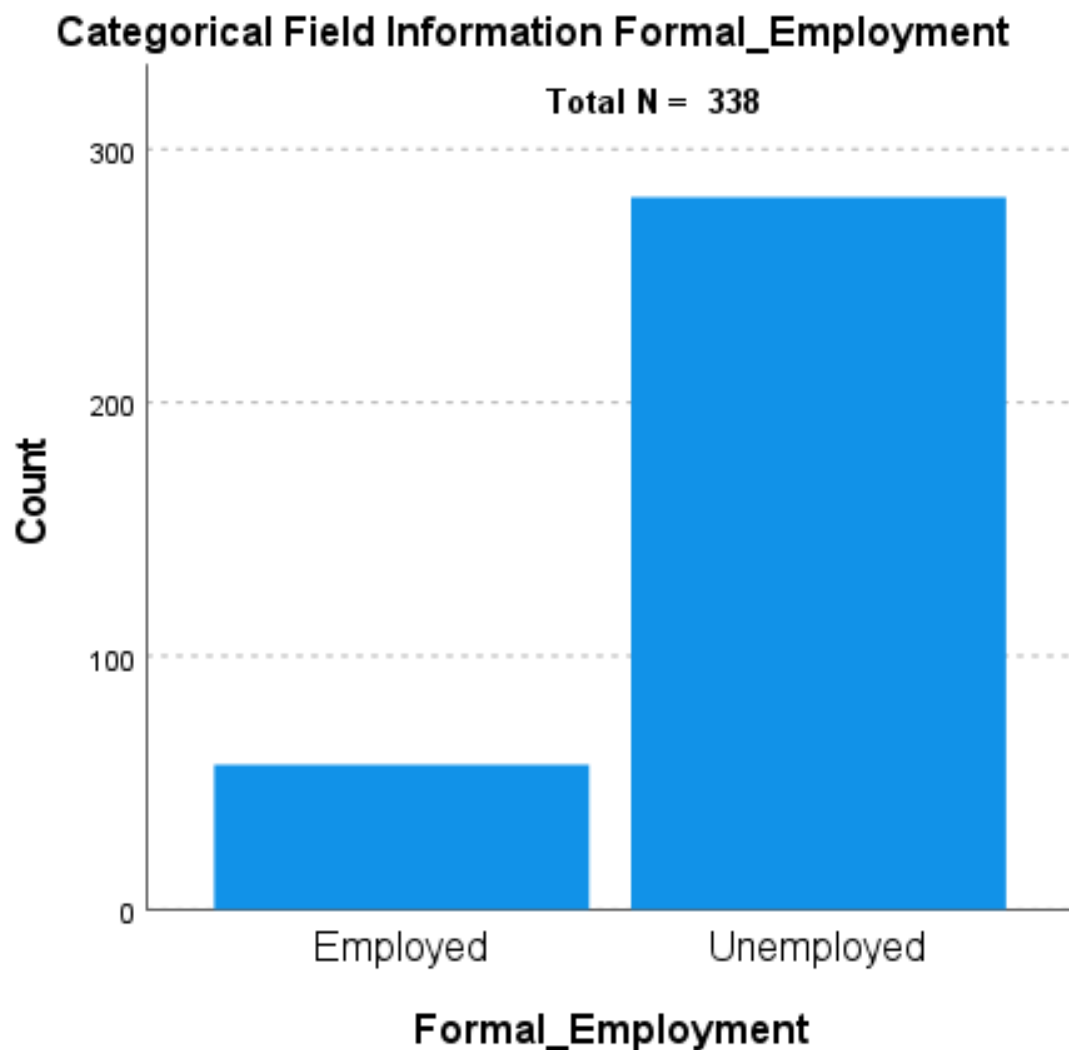


Figure 6.5: A bar chart of the respondents' formal education distribution

The graph above illustrates that a significant proportion of respondents in the study area are unemployed, highlighting a prevalent lack of formal employment opportunities. This observation suggests that despite the ongoing oil and gas activities in the region, which theoretically should generate economic benefits and job opportunities, these benefits are not translating into substantial formal employment for the local population. The high unemployment rate among respondents underscores a critical socio-economic challenge within the study area. It points to a disconnect between the oil and gas sector's operations and the local workforce, potentially due to a lack of skills, education, or access to job opportunities within the industry. This finding emphasizes the need for targeted

interventions, such as skills training, education, and local hiring policies, to ensure that the economic activities associated with oil and gas exploration and production contribute more effectively to local employment and community development.

6.9 Benefits of oil and gas development in the study area

The preceding sections of this chapter examined the negative impacts of oil and gas extraction activities on the environment and socio-economic livelihoods. This section was designed to assess the extent to which the operations of oil companies have contributed to positive development in the study area based on respondents' perspectives. According to the data presented in Table 6.12, 37.5 per cent of respondents indicated that oil and gas development has enabled the construction of motorable roads within their communities. In contrast, only 11 per cent noted that these activities have resulted in job creation. Furthermore, when analyzing the overall disagreement rates from the survey, it becomes evident that the respondents identified the least favourable socio-economic developments as a reduction in poverty levels, reported at 51.9 per cent; improvements in electricity generation, at 55.4 per cent; and enhanced access to well-equipped educational facilities in rural areas, at 64.5 per cent.

Table 6.12: Perceived benefits of oil and gas development

S/N	Indicators	I don't know	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Motorable road	25/7.4%	53/15.6%	54/16.0%	24/7.1%	55/16.2%	127/37.5%
2	Employment opportunities	12/3.5%	45/13.3%	72/21.3%	110/32.5%	62/18.3%	37/11.0%
3	Education	0/0%	144/42.6%	74/21.9%	0/0%	55/16.2%	65/19.2%
4	Electricity	34/10.0%	88/33.0%	76/22.4%	6/1.7%	45/13.3%	89/19.3%
5	Poverty reduction	0/0%	87/25.7%	75/26.2%	38/11.2%	80/19.6%	58/17.2%
6	Commercial activities	4.4%	20.2%	7.7%	13.6%	27.2%	26.8%

The analysis of socio-economic impacts in relation to gender revealed a notable disparity, with a greater percentage of men reporting an increase in commercial activities compared to their female counterparts. Nevertheless, other variables, including the respondents' community of residence, educational attainment, and primary income source, did not demonstrate statistically significant influences on their perceptions of the socio-economic effects associated with these activities.

The Kruskal-Wallis test was conducted to further examine the survey responses for perceptions regarding the positive effects of oil and gas development across different occupations. The results in Table 6.13 below show that all response variables produced statistically significant results ($p < .05$).

Table 6.13: Summary of Kruskal-Wallis test for perceived positive effect of oil and gas development

Response variables	Indicators	Test statistic (H)	Degree of freedom	P-value
Occupation	Motorable road	306.957	6	0.000
	Employment opportunities	292.983		
	Education	296.255		
	Electricity	304.957		
	Decrease in poverty	317.944		
	Increase in commercial activities	288.371		
Residency period	Motorable road	306.399	5	0.000
	Employment opportunities	271.962		
	Education	305.895		
	Electricity	288.362		
	Decrease in Poverty	283.581		

	Increase in commercial activities	270.604		
Level of education	Motor able road	290.518	5	0.000
	Employment opportunities	306.992		
	Education	306.049		
	Electricity	301.635		
	Decrease in poverty	308.758		
	Increase in commercial activities	282.442		

In addition, a Jonckheere-Terpstra test was conducted to assess perceptions of the positive effects of oil and gas development across different occupations. The findings revealed that the median rank value (4.00) for motorable roads was statistically significant with $J-T = 3357.500$, $z = -20.491$, $p = 0.000$. Similarly, employment opportunities, education, electricity, poverty reduction, and increased commercial activities all had statistically significant median rank values of 4.00, with p-values of 0.000. This suggests that respondents across various occupations perceive these attributes as significant positive effects of oil and gas development in the study area. Pairwise comparisons indicated that most pairs were significant, except for farming/artisan, farming/employed unemployed/others, and others/fishing with adjusted p-values of 0.167, 0.114, 0.126 and 0.356, respectively. These results imply that respondents are less conservative in their opinions on the positive impacts of oil and gas development, with significance values adjusted by the Bonferroni correction for multiple tests.

6.10 EIA's effect on decision-making

The survey respondents were asked to indicate their opinions on EIA's main effect on environmental decision-making in the petroleum sector. As shown in Figure 6.7, 14 per cent of respondents indicated that EIA had led to moderate environmental consideration in project planning and design, about 11 per cent felt that it had not been effective in ensuring environmental consideration during project design, and 45 per cent believed that EIA had not significantly led to extensive changes. Only 22.1 per cent of respondents suggested that EIA had led to significant environmental consideration within projects. Additionally, 2.6 per cent were unsure and 5.3 per cent maintained a neutral position.

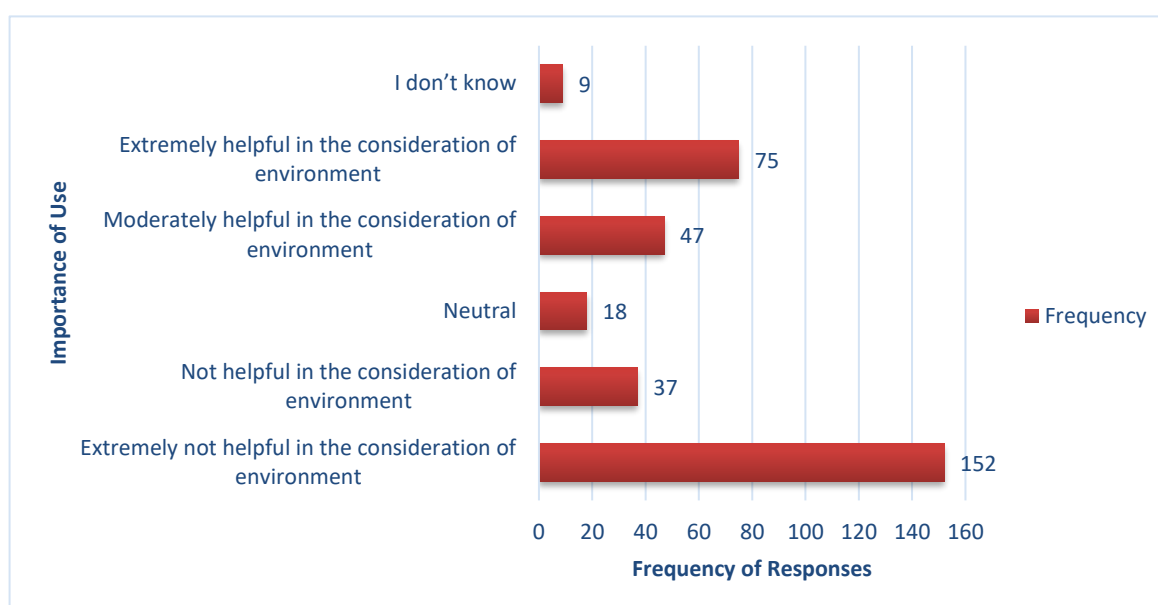


Figure 6.6: Bar chart of EIA's effect on project decision-making

6.11 Public participation

Public participation was a key focus of the community questionnaire, which aimed to gauge local involvement in the EIA-related processes related to oil and gas activities. Respondents were asked if they had ever participated in EIA processes for oil and gas projects. As shown in Figure 6.8, 54 per cent of respondents indicated they had never participated, while only 29 per cent reported having occasionally had the opportunity to be involved. It can be inferred from these findings that there has been limited participatory opportunity for the local inhabitants to contribute to decision-making

related to oil and gas environmental management in their locality despite being disproportionately affected by the operations of the oil companies in the Niger Delta region. The lack of public participation highlights a critical gap in incorporating community voices into environmental decision-making, potentially undermining the centrality of EIA to oil and gas environmental management in Nigeria.

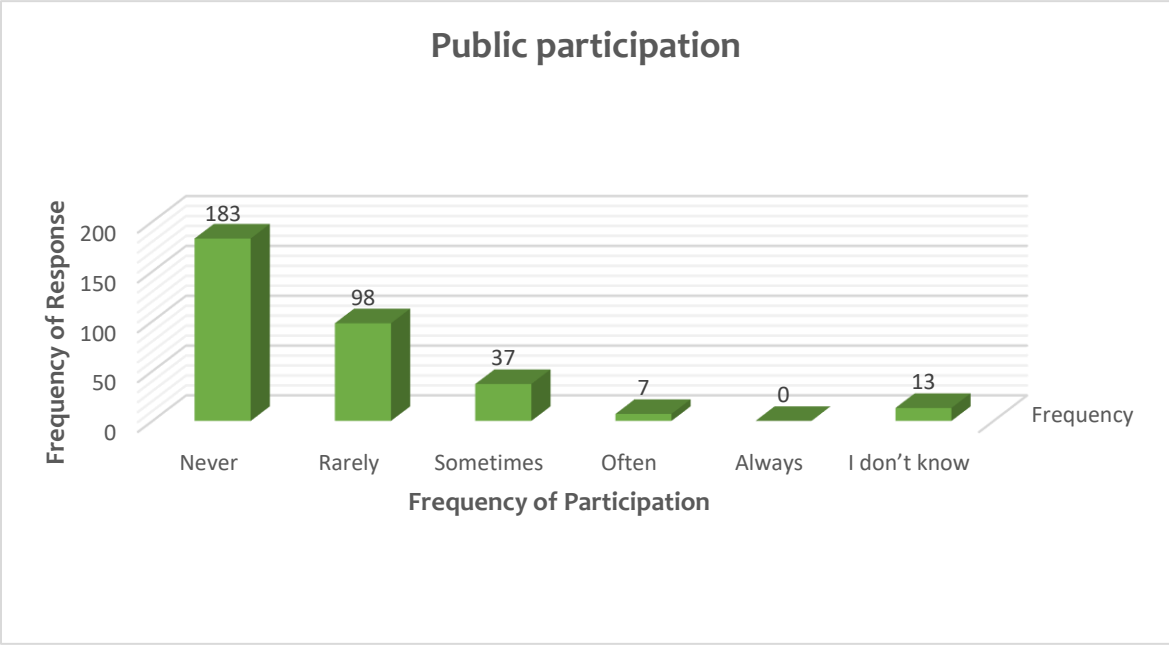


Figure 6.7: Public participation

6.12 Public participation and alternative consideration

The preceding section provided an overview of the public consultation and engagement levels associated with the oil and gas EIA-related process in Nigeria. This section explores the perspectives of respondents regarding the extent to which their limited involvement in the EIA public review process has significantly affected decision-making, particularly in relation to alternative options. As indicated in Table 6.14, the average mean score was recorded at 2.63, accompanied by a standard deviation of 1.629, which reflects a general consensus of disagreement among participants. These results illustrate a predominantly negative viewpoint, emphasizing that the engagement of local communities in the decision-making process has had a negligible effect on critical decisions concerning project design or the placement of oil and gas infrastructure in the Niger Delta region. This limited influence highlights a significant disconnect between public participation and substantial contributions to the decision-making processes governing oil and gas

development. It can be inferred that the EIA process within the oil and gas sector is predominantly guided by expert assessments and decisions, with little to no input from local community members who are directly affected by the detrimental consequences of oil and gas operations in the Niger Delta region.

Table 6.14: Public participation and alternative consideration

	N	Mean	Std. Deviation
Does the involvement of the local community members in oil and gas EIA-related processes inform alternative consideration	338	2.63	1.629

5: Strongly agree. 4: Agree. 3: Neutral. 2: Disagree. 1: Strongly disagree. 0: I don't know

6.13 Barriers to public participation

The survey explored the main barriers to public participation in oil and gas EIA processes, focusing on eight key obstacles. Table 6.15 below shows that the legislative framework recorded a score above 3, which indicates that it is the primary barrier to effective public participation. Other significant barriers included lack of awareness (mean score: 3.71), loss of community spirit (mean score: 3.57), gender gap (mean score: 3.39) and inadequate funding (mean score: 3.30). These barriers collectively undermine the involvement of local communities in the EIA process, preventing the integration of their lived experiences and local knowledge.

Table 6.15: Mean score of barriers to public participation

	N	Mean	Std. Deviation
Legislative framework	338	3.73	1.417
Lack of adequate time	338	2.53	1.480
Lack of awareness	338	3.71	1.516
Gender gap	338	3.39	1.656
Understanding the scourge of oil and gas impact	338	1.17	1.243
Loss of community spirit	338	3.57	1.572
Funding	338	3.30	1.678

5: Strongly agree. 4: Agree. 3: Neutral. 2: Disagree. 1: Strongly disagree. 0: I don't know

This exclusion risks the collection of limited environmental baseline data, leading to project assessments that may rely on incomplete or misleading information, resulting in unsustainable project approvals and negative environmental and socio-economic outcomes. Addressing these barriers is crucial for enhancing the effectiveness and predictive quality of the EIA process in the petroleum sector, as highlighted in the statistical findings presented in Table 6.15.

A Kruskal-Wallis test was conducted to examine further the survey perceptions regarding the barriers to public participation across the different occupations. The results in Table 6.16 below show that all response variables produced statistically significant results ($p < .05$).

Table 6.16: Summary of Kruskal-Wallis test for barriers to public participation

Response variables	Indicators	Test statistic (H)	Degree of freedom	P-value
Occupation	Lack of awareness	310.349	6	0.000
	Funding	310.743		
	Understanding the scale	311.962		
	Gender gap	294.277		
	Legislative framework	299.725		
	Loss of community spirit	290.863		
	Lack of adequate time	299.163		
Residency period	Lack of awareness	299.528	5	0.000
	Funding	324.502		
	Understanding the scale	296.302		
	Gender gap	284.641		
	Legislative framework	309.947		
	Loss of community spirit	302.426		
	Lack of adequate time	305.021		
Level of education	Lack of awareness	310.986	5	0.000
	Funding	300.507		
	Understanding the scale	305.189		
	Gender gap	324.369		
	Legislative framework	307.830		
	Loss of community spirit	300.632		
	Lack of adequate time	314.045		

In addition, a Mann-Whitney U test was conducted to examine the differences in perceptions of barriers to public participation among landowners. The results showed that lack of awareness (mean rank: 281.00), lack of funding (mean rank: 37.30), understanding of scale (mean rank: 271.00), gender gap (mean rank: 44.52), legislative framework (mean rank: 35.27), loss of community spirit (mean rank: 31.44) and lack of adequate time (mean rank: 278.00) were all statistically significant barriers ($p < .001$). These findings suggest that perceptions of these barriers are notably higher among landowners than other groups. Pairwise comparisons indicated that all pairs were significant except for unemployed/others and others/traders, with adjusted p-values of 0.399 and 0.356, respectively. This suggests that the groups are generally less conservative in their opinions regarding these barriers, with significance values adjusted using the Bonferroni correction for multiple tests.

6.14 Impact of agencies and organisations involved in environmental management

For many years, numerous agencies and organizations have actively participated in the management of oil and gas-related pollution within the Niger Delta region. This section of the questionnaire survey aimed to gather the opinions of respondents regarding which agencies and organizations they believe are instrumental in addressing the environmental impacts associated with pollution in their communities. As illustrated in Table 6.17, the Federal Ministry of Environment achieved a score exceeding 3, signifying its role as the foremost ministry in this domain. Additionally, other notable contributors to environmental management included the National Oil Spill Detection and Response Agency, which received a mean score of 3.47; the Hydrocarbon Pollution Remediation Project with a mean score of 3.39; and the Department of Petroleum Resources, which garnered a mean score of 3.35.

Table 6.17: Impact of agencies and organisations in environmental management

	N	Mean	Std. Deviation
Federal Ministry of Environment	338	3.48	1.566
Department of Petroleum Resources	338	3.35	1.563
Hydrocarbon Pollution Remediation Project	338	3.39	1.547
State Ministry of Environment	338	2.28	1.541
National Oil Spill Detection and Response Agency	338	3.47	1.676

Note: 5: extremely impactful. 4: very impactful. 3: neutral. 2: not impactful. 1: extremely not impactful. 0: I don't know

6.15 Stakeholders involved in raising environmental management issues

Survey participants were additionally requested to share their perspectives on which stakeholders they believed were most actively involved in advocating for environmental considerations within decision-making processes. A mean score system was utilized, ranging from 5 (strongly agree) to 0 (I don't know), to assess the perceived importance of each stakeholder's contribution. Scores above 3 were interpreted as a consensus in favour, while those below 3 indicated a lack of agreement. The summarized findings presented in Table 6.18 indicate that the mean scores for the majority of categories are below 3, with the exception of the host community (4.12), environmental mNGOs (3.74) and donors (3.74).

Table 6.18: Stakeholders involved in raising environmental management issues

	N	Mean	Std. Deviation
Regulatory bodies	338	2.43	1.565
Developers	338	2.19	1.509
Oil and gas host communities	338	4.12	1.302
Statutory environmental consultee	338	1.04	1.052
ENGOS	338	3.96	1.190
International finance development or donor organisations	338	3.74	1.472

To gain deeper insights into the survey responses concerning perceptions of stakeholder efforts in addressing environmental management issues, Kruskal-Wallis test was performed. The findings presented in Table 6.19 indicate that all response variables yielded statistically significant results ($p < .05$). This suggests that the perceptions of these attributes regarding stakeholder initiatives in environmental management are notably elevated within the context of the study area. Furthermore, the pairwise comparisons conducted revealed that all pairs exhibited significant differences. The significance of these differences implies that respondents are less conservative in their views regarding the surrounding circumstances, with significance values adjusted through the Bonferroni correction for multiple comparisons.

Table 6.19: Summary of Kruskal-Wallis test for efforts of stakeholders in raising environmental management issues on the effects of oil spillage

Response variables	Test statistic (H)	Degree of freedom	P-value
Regulatory bodies	258.701	5	0.000
Developer	290.906		
Host community	289.266		
Statutory environmental consultee	277.462		
ENGOS	31.775	2	
Donors agencies	273.443	5	

6.16 Compensation for impacted vs compulsory land acquisition

The survey sought the respondents' perceptions regarding compensation for compulsory land acquisition and the impact on land due to oil extraction. The results unveiled a stark disparity in compensation distribution among the local inhabitants in the oil host communities of the old frontier region in the Niger Delta. Individuals whose land was impacted by oil and gas extraction were not adequately compensated compared to those whose land was compulsorily acquired.

Table 6.20: Compensation for impacted vs compulsory land acquisition

	N	Mean	Std. Deviation
Compulsory land acquisition	338	4.28	0.997
Land impacted	338	2.33	1.572

As depicted in Table 6.20, the mean score for land acquisition is 4.28, with a correspondingly low standard deviation of 0.99, while the score for impacted land is less than 3. This implies that individuals whose land was contaminated by the activities of oil companies are at the mercy of those powerful corporations to pay them compensation. In light of these results, it becomes apparent that the contentious and prolonged confrontations between local communities and oil firms are rooted in the absence of distributive and procedural justice and the infringement of people's right to fair compensation for impacted land.

6.17 Barriers to compensation

In order to ascertain the barriers to compensation within oil-producing communities, survey participants were requested to indicate their perspectives on seven primary barriers that were recognized during the preliminary assessment conducted in the Niger Delta region (refer to Table 6.22). The average scores presented in Table 6.22 were utilized to determine the significance of each barrier to compensation. These scores were derived from a Likert Scale ranging from 5 (strongly agree) to 0 (I don't know), with the intermediate values representing varying degrees of agreement or disagreement. In the analysis, mean scores exceeding 3 indicate a consensus among respondents, whereas scores below 3 suggest a lack of agreement. As detailed in Table 6.22, bureaucracy emerged as the most significant barrier, achieving a mean score of 3.94 and a standard deviation of 1.4. This was followed by corruption with a mean score of 3.72, challenges related to unclear or contradictory guidance at 3.70, and financial constraints at 3.67. These findings underscore the existence of various structural challenges that impede compensation initiatives for those whose lands and livelihoods have been profoundly impacted by oil and gas-related pollution in the Niger Delta region.

Table 6.21: Mean score of barriers to compensation

	N	Mean	Std. Deviation
Bureaucracy	338	3.94	1.439
Financial	338	3.67	1.528
Corruption/lack of political will	338	3.72	1.564
Unclear or contradictory guidance	338	3.70	1.474
Logistics	338	2.07	1.261
Traditional governance structures	338	2.09	1.451
Lack of negotiation skills	338	1.27	1.072

To gain deeper insights into the survey responses regarding the barriers to compensation, Kruskal-Wallis test was performed. As observed in Table 6.22 below, all the variables produced statistically significant results ($p < .05$). The findings suggest that the perception of these attributes concerning barriers to compensation is notably elevated among the variables related to the activities within the study area. The analysis further indicates that the mean rank value for bureaucracy is 152.06, which is statistically significant with $U = 3106.500$, $z = -7.887$, and $p < .001$. Similarly, the mean rank value for finance stands at 148.91, also statistically significant with $U = 2223$, $z = -9.049$, and $p = .000$. The mean rank for corruption or lack of political will is identical at 148.91, with the same statistical significance ($U = 2223$, $z = -9.049$, $p = .000$). Additionally, the mean rank value for unclear or contradictory guidance is 151.35, which is statistically significant with $U = 2907$, $z = -8.076$, and $p < .001$. The mean rank for logistics is recorded at 149.62, with statistical significance ($U = 2422.500$, $z = -8.759$, $p = .000$). Traditional governance structures have a mean rank value of 141.98, which is statistically significant ($U = 276.000$, $z = -12.307$, $p = .000$). Lastly, the mean rank for the negotiation skills of the respondents is 147.90, also statistically significant with $U = 1938$, $z = -9.367$, and $p = .000$. The pairwise comparison conducted revealed that all pairs are significant. The significance of the differences among these variables indicates a less conservative stance in their perceptions regarding the surrounding circumstances, with significance values adjusted through the Bonferroni correction for multiple comparisons.

Table 6.22: Summary of Kruskal-Wallis test for barriers to compensation

Response variables	Test statistic (H)	Degree of freedom	P-value
Bureaucracy	322.184	5	0.000
Financial	283.556		
Corruption/lack of political will	283.556		
Unclear or contradictory guidance	284.495		
Logistics	292.413		
Traditional governance structures	278.759		
Negotiation skills	279.572		

6.17 Chapter Summary

This chapter presented the results that were established through analysis of the community questionnaire survey. The responses collected were processed using Microsoft Excel and analyzed with the aid of SPSS and STATA Statistical Software version 17. The evidence derived from the results indicates that, despite the existence and application of the EIA to response to the environmental risk posed by oil and gas exploration and development, there has been minimal progress in terms of environmental protection and management. Moreover, the analysis revealed that public consultation and participation—essential components of the EIA process—are often regarded as mere formalities by oil companies and the government in Nigeria. This lack of genuine and effective inclusivity in the oil and gas EIAs may be a primary factor contributing to project assessments that depend on limited environmental baseline data, which can be misleading or inaccurate. Such practices often lead to the approval of unsustainable projects, resulting in significant and often unquantifiable adverse effects on the environment and the socio-economic well-being of local communities in the study area.

The chapter concludes by highlighting the challenges associated with compensating local residents for the damage sustained to their agricultural land as a result of the adverse effects of oil and gas drilling operations. The existing compensation framework has proven to be severely inadequate, indicating a substantial failure to address the socio-

economic hardships faced by the impacted communities. It has been observed that this compensation scheme is hindered by a frail legal framework, ambiguous legislative guidelines for filing claims, and a notable lack of political commitment from the government to hold oil companies accountable, among other issues. Consequently, it is essential for policymakers and decision-makers within Nigeria's petroleum sector to ensure the effective implementation of both procedural and substantive aspects of the current EIA decision-support tool in the planning and management of oil and gas project development. Furthermore, where appropriate, there should be an adoption of a "Strategic Environmental Assessment," which can facilitate a broader evaluation of the potential environmental liabilities or costs associated with policies, plans and programmes development initiatives in the oil and gas sector before ramping up of downstream project assessment at the level of EIA process.

CHAPTER SEVEN

Practitioners' Questionnaire Analysis and Results

7.1 Introduction

This previous chapter discussed the quantitative findings obtained from the community survey administered to the community members living in the old frontier of the Niger Delta region. This chapter presents the quantitative findings obtained through the practitioner's survey. The expert survey was conducted to gain insights regarding the current state of EIA practice and its associated strengths and limitations in Nigeria's oil and gas industry. The chapter also examined the respondents' awareness of SEA, its level of acceptability and recommendations for its integration into oil and gas planning and development processes. The analysis of the data obtained from the practitioner's survey has been summarised, described and presented in a manner that facilitates easy comprehension and contributes to answering the research objectives. Finally, the chapter details the analysis of the practitioner's survey through the application of descriptive statistical techniques and non-parametric inferential statistics.

7.2 Social demographic characteristics of respondents

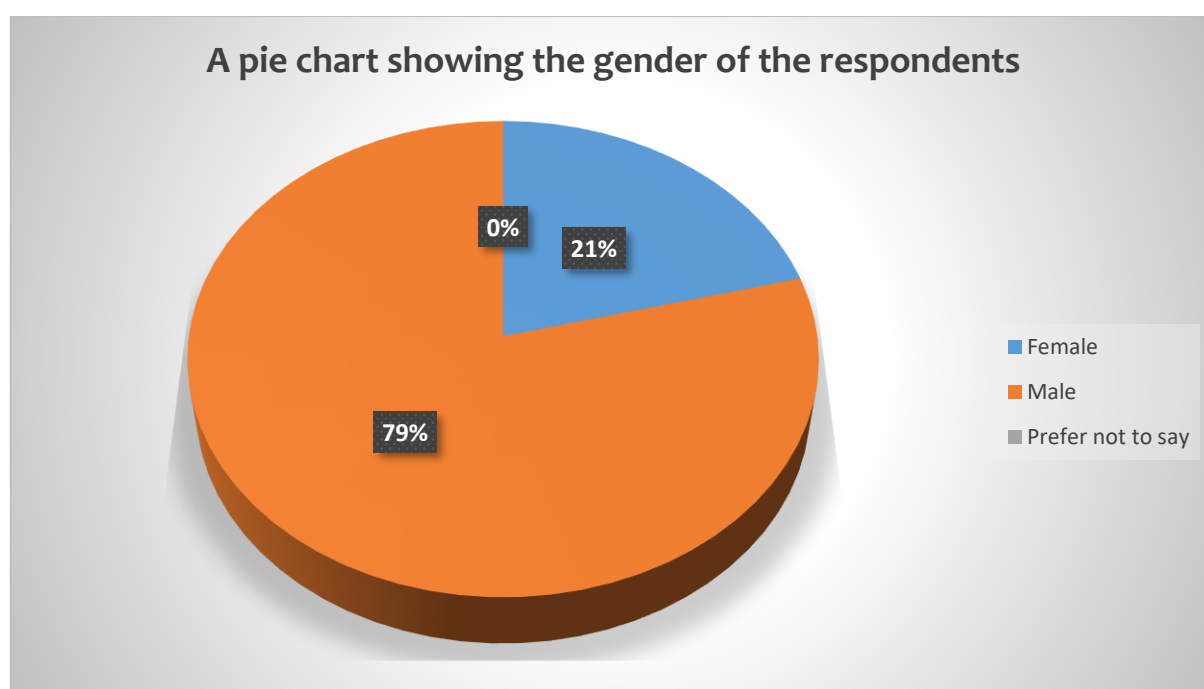
In order to establish an overview of the current state of practice of the EIA in Nigeria's oil and gas industry, information related to specific variables such as education, gender, expertise/professional disposition and years of experience of the stakeholders involved in oil and gas EIAs were collected. This information was used as a building block to develop the demographic profiles of the research respondents. By incorporating these variables into the analysis, the researcher aimed not only to capture the breadth of diversity among the stakeholders involved in oil and gas EIAs but also to examine if any of the attributes associated with survey respondents had any influence on their perspectives on the current state of EIA practice in Nigeria's oil and gas sector.

Table 7.1: Social demographics of the respondents

		Number (N)	Percentage (%)
Gender	Female	39	21.0
	Male	147	79.0
	Prefer not to say	0	0.0
TOTAL		186	100.0
Practitioners	Consultant	19	17.2
	ENGOS/other consultee	32	10.2
	Developer/Proponent	27	14.5
	Statutory consultee	45	24.2
	EIA Academic expert	63	33.9
TOTAL		186	100.0
Years of experience	0-5 years	19	10.2
	6-10 years	48	25.8
	11-15 years	60	32.3
	16-20 years	33	17.7
	20 years and above	26	14.0
TOTAL		186	100.0
Educational Qualification	Diploma	29	15.6
	Bsc	113	60.8
	Postgraduate	44	23.7
TOTAL		186	100.0

As shown in Figure 7.1, 79.0 per cent (n=186) of the survey respondents were male, while 21.0 per cent were female. The underrepresentation of women in the oil and gas EIAs is intricately linked to broader societal arrangements in Nigeria. In particular, few women have been engaged in formal employment compared to their male counterparts in Nigeria.

Figure 7.1: A chart of the description of gender of respondents



7.2.1 Professional categorization of survey respondents

In order to establish their primary involvement and interest in the EIA process within the oil and gas industry, the survey respondents were asked to indicate their professional and/or organizational affiliations. The breakdown of stakeholders' primary affiliations and roles in undertaking or participating in the oil and gas EIA process is displayed in Figure 7.2 below. The results reveal that most of the respondents were from academics, constituting 33.9 per cent, followed by statutory consultees and consultants, accounting for 24.2 and 17.2 per cent respectively. The remaining percentages of the professional categorisation of respondents were split among developers and environmental NGOs /other consultees. Conspicuously, the overall results show the highest percentage of EIA

academic experts, statutory consultees and consultants among the practitioners’ survey. Intriguingly, the ENGOs exhibited the least representation among the stakeholders with primary roles and interests in the oil and gas EIAs.

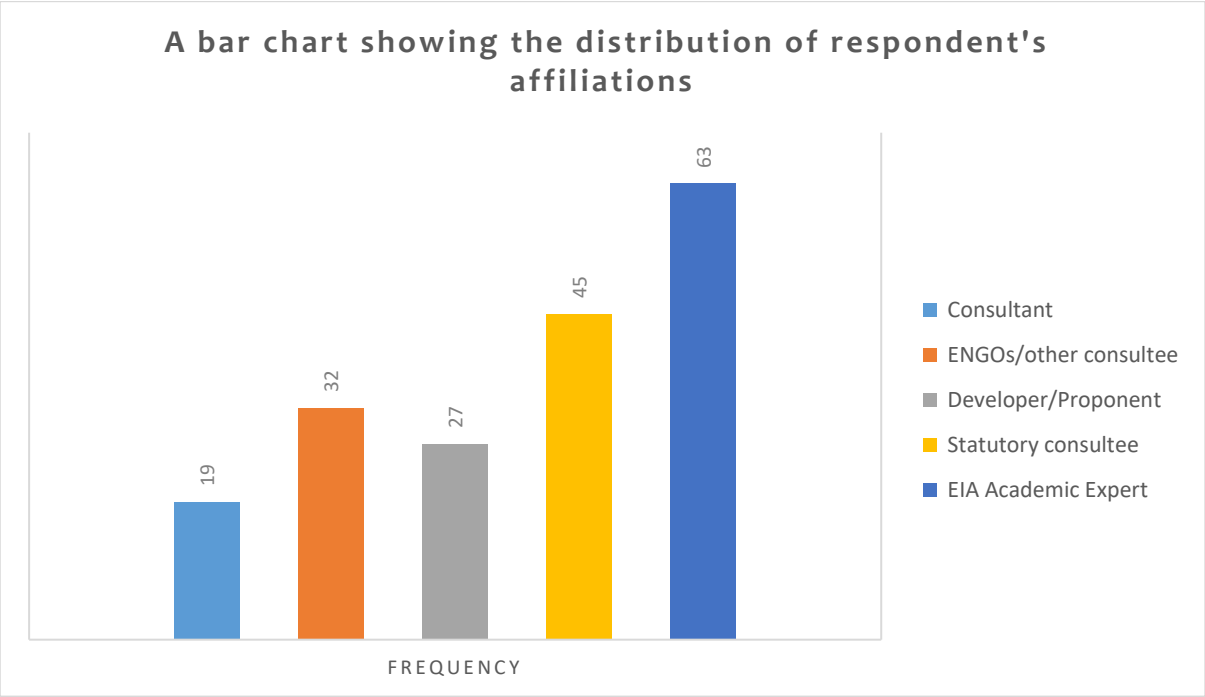


Figure 7.2: A bar chart showing the distribution of respondent’s affiliations

Hence, it can be inferred that the ENGOs/other consultees have little or no involvement in the EIA process. Therefore, these results raise questions about the extent of ENGOs and, to a larger degree, community engagement and influence in shaping EIA-related processes and environmental considerations within Nigeria's oil and gas sector.

7.2.2 Length of experience dealing with EIA relating to oil and gas sector

Figure 7.3 illustrates the distribution of responses regarding the years of EIA experience among the survey respondents. As shown in Figure 7.3, about 32.3 per cent (n=186) of participants had experience from 11 to 15 years relating to oil and gas EIAs in Nigeria.

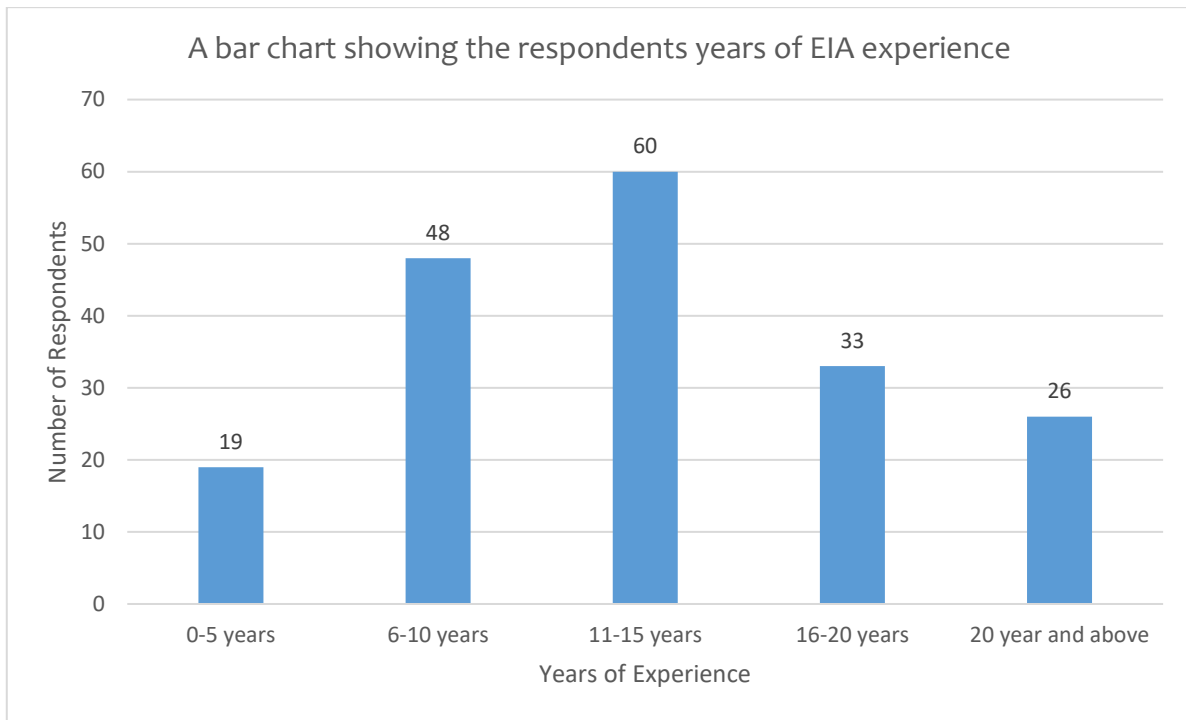


Figure 7.3: A bar chart showing the respondent's years of EIA experience

The second-largest group of stakeholders, representing 25.8 per cent of the participants, has been involved in oil and gas EIAs for a duration of 6 to 10 years. Considering that a significant portion of the survey respondents possess more than ten years of experience and knowledge in EIAs, their responses are anticipated to provide nuanced insights into the current state of EIA practice in Nigeria's petroleum industry.

7.2.3 Educational qualification of survey respondents

As depicted in Figure 7.4 below, a greater percentage (60.8) of the participants have a Bachelor's Degree (BSc). Following this, approximately 23.7 per cent held postgraduate qualifications, while a slightly above quarter of the respondents had a Diploma certificate. While respondents with Diploma qualifications constitute the smallest segment of the survey participants, they may likely add diversity to the educational profile and offer unique perspectives and practical experiences that enrich the overall dynamics of the survey findings.

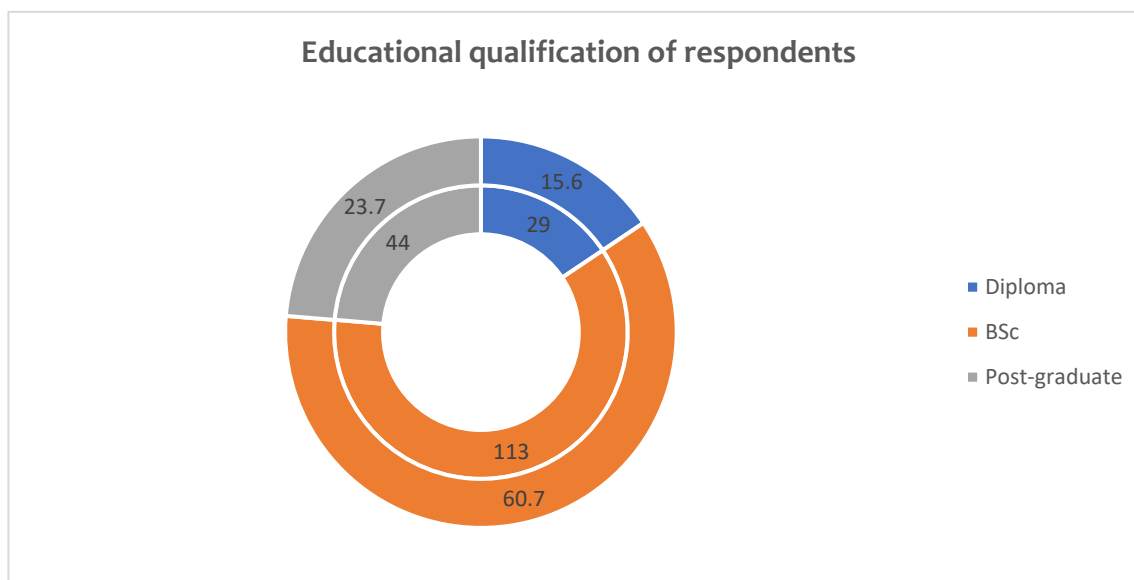


Figure 7.4: Educational qualification of survey respondents

Overall, the prevalence of individuals within the participant pool with at least a degree level and Diploma qualification attests to a baseline level of academic proficiency and professional competence in their chosen field. The prevalence of such educational credentials indicates collective expertise among the participants, providing a solid knowledge base for their engagement in the subject matter under consideration.

7.2 Define the influence of EIA in Nigeria's oil and gas sector

This section presents a summary of the practitioner's questionnaire, which examined the influence of EIA on the decision-making process in Nigeria's oil and gas sector. The results indicate a prevailing consensus among respondents that EIA had an influence on the decision-making process. However, regarding the specificities of the EIA's influence in the decision-making process within the oil and gas sector, the survey findings revealed that 61.3 per cent of participants acknowledged that the EIA had a positive influence in raising environmental awareness within the petroleum sector, underscoring its role in fostering a heightened understanding of environmental considerations (See Table 7.2).

Table 7.2: Influence of EIA in oil and gas sector

Influence	N	Percentage
Positive Influence	114	61.3
Negative Influence	72	38.7

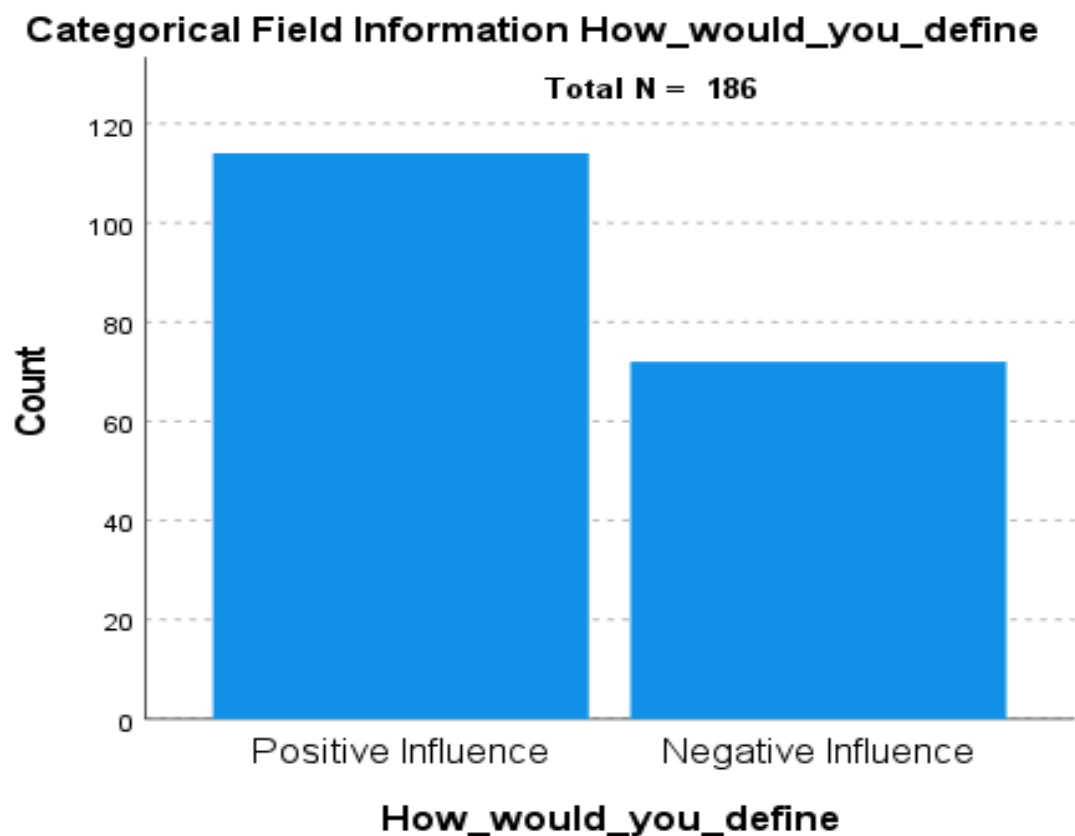
Note: 1: Positive Influence. 2: Negative Influence.

A Kruskal-Wallis H test was conducted to determine if there are any demographic traits of the respondent that may define the influence of EIA in Nigeria's oil and gas sector. The non-parametric test was selected due to the Likert-scale nature of the survey, the presence of outliers in the distribution groups, the distribution of the groups moving in the same direction and the failure of the data to pass the Shapiro-Wilk test of normality. A summarised result of the H-test is provided in Table 7.3 below.

Table 7.3: Summary of Kruskal-Wallis test for the influence of EIA in oil and gas sector

Response variable	Test statistic (H)	Degree of freedom	P-value
Practitioners	154.816	4	0.000
Years of experience	142.309	4	
Educational qualification	180.865	2	

As observed in Table 7.3 above, all the response variables produced statistically significant results ($p < .05$). In addition, a Mann-Whitney U test was conducted for gender to explore the differences within the groups of influence. The results obtained confirmed that the mean rank values for this variable in the female (150.50) are statistically significant to the mean rank for the male gender (78.38) with $U = 5089.500$, $z = 8.815$, $p = .000$. The pairwise comparison conducted showed that all pairs are significant except the pair of 0-5 years /11.15 years, NGOs/ EIA regulators and developer/proponent-EIA Regulators with adjusted p-value of 0.919, 0.766 and 0.925 respectively. The significance of the difference in these response variables infers that they are less conservative in their opinion regarding circumstances with significance values adjusted by the Bonferroni correction for multiple tests.



How_would_you_define field is ordinal but is treated as continuous in the...

Figure 7.5: A bar chart of the influence of EIA in decision-making

7.3 Perceptions of EIA's effect on decision-making

This section presents a summary of the practitioner's questionnaire, which examined the extent to which EIA contributes to decision-making. The results indicate a prevailing consensus among respondents that EIA had an impact on the decision-making process. However, regarding the specificities of the EIA's impact in the decision-making process within the oil and gas sector, the survey findings revealed that 67.8 per cent of participants acknowledged that the EIA had an impact in raising environmental awareness within the petroleum sector, underscoring its role in fostering a heightened understanding of environmental considerations. The provision of information to decision-makers also emerges as a significant aspect, with 65.1 per cent of respondents affirming the influence of EIA in facilitating the consent and approval of oil and gas projects. Furthermore, 58.0 per cent of participants said that the EIA influenced

enhancing awareness about the environmental implications of oil and gas projects (See Table 7.4). This highlights its contribution to informed decision-making by equipping key stakeholders to formulate decisions and actions to help mitigate or prevent the negative environmental impacts of oil and project development. Regarding project redesign and changes, 50.6 per cent of respondents agree that EIA exerts influence, indicating its perceived impact on improving the oil and gas project design.

Table 7.4: Summary responses of EIA's effect on decision-making

Statements	I don't know	Not influential	Uninfluential	Neutral	Influential	Extremely influential
Reinforces environmental safeguards	16/8.6%	32/17.2%	27/19.5%	11/5.9%	44/23.7	56/25.1%
Raises environmental awareness	09/4.8%	26/14.0%	22/11.8%	03/1.6	58/31.2%	68/36.6%
Provides information to decision-makers	10/5.3%	29/15.6%	19/10.2	07/3.8%	55/29.6	66/35.5%
Approval of oil and gas project	09/4.8%	37/20.0%	24/12.9%	08/4.3%	49/26.3%	59/31.7%
Improves public participation	16/8.6%	35/18.8%	24/12.9%	06/3.2%	64/34.4%	41/22.0%
Promotes environmental governance	18/9.7%	33/17.7%	30/16.1%	20/10.8	38/20.4%	47/25.3%
Improves project planning & design	17/9.1%	30/16.1%	25/13.4%	20/10.8%	38/20.4%	56/30.2%
Provides well-informed decisions	20/10.7%	38/20.4%	24/12.9%	10/5.4%	44/23.7%	50/26.9%
Provides proactive	11/5.9%	26/14.0%	36/19.4%	17/9.1%	52/28.0%	44/23.6

environmental

mitigation

measures

Improves	14/7.5%	34/18.3%	28/15.0%	18/9.7%	39/21.0%	53/28.5%

relations between

oil companies and

the host

communities

Improves capacity	18/9.7%	36/19.4%	29/15.6%	13/6.9%	48/25.8%	42/22.6%

building or skills

As is evident from the breakdown of responses outlined in Table 7.4 above, most practitioner survey participants seem to disagree with the degree of scepticism expressed by the community survey respondents that EIA hardly informs oil and gas project decisions or the process is unable to provide a balance between environmental quality and hydrocarbon development in the decision-making process. Furthermore, the findings show that stakeholders who were based in organisations and fields dealing with EIA related to the oil and gas sector were also optimistic regarding EIA's influence in the decision-making process. Hence, it can be inferred that as the most knowledgeable and experienced respondents, the EIA practitioners echo the notion that the EIA process may not have imparted significant added value across all critical components and stages of the decision-making process but can facilitate moderate improvement in project design and approval consents the petroleum industry.

Table 7.5: Summary of J-T test for the perceptions of EIA's effect on decision-making

Variable	Statement	Test statistic (J-T)	Z-value	P-value
Years of experience	Reinforces environmental safeguards	12712	15.146	0.000
	Raises environmental awareness	12330	14.456	
	Provides information to decision-makers	12504.500	14.834	
	Enhances knowledge of the oil and gas project impacts	12691	15.178	
	Improves public participation	12562	14.862	
	Promotes environmental governance	12726	15.078	
	Improves project design	12762.500	15.231	
	Provides well-founded decision making	12736.500	15.169	
	Provides proactive environmental measures	12624.500	14.897	
	Improves relations between oil companies and the host communities	12675	15.004	
	Improves capacity building and skills	12690	15.024	

As observed in Table 7.5 above, all the variables produced statistically significant results ($p < .05$). This infers that the perspective of these attributes is sufficiently higher within the years of experience as regards the perceptions of EIA's effect on decision-making in the oil and gas sector. The pairwise comparison conducted showed that all pairs are significant except for 16-20 years/above 20 years with a p-value of 0.588. The significance of these variables infer that they are less conservative in their opinion regarding perceptions of EIA's effect on decision-making in the oil and gas sector with significance values adjusted by the Bonferroni correction for multiple tests.

7.3.1 Respondents' perceptions of EIA's influence in controversial decisions

Having established the added value of EIA in the decision-making process, the practitioner questionnaire survey also explored participants' perceptions on whether EIA contributes to controversial decisions or negative EIA resolutions in the petroleum sector. A summary of the findings is presented in Table 7.6. the rating of the percentage associated with EIA's influence in controversial decisions in the oil and gas industry was in the order of "Strongly agree", "Agree", "Neutral", "Disagree", "Strongly disagree", and "I don't know".

Table 7.6: Summary responses on EIA's negative influence in controversial decisions

S/N	Statement	I don't know	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Justified project approval based on political consideration	9/4.8%	35/18.8%	23/12.4%	15/8.1%	41/22.0%	63/33.9%
2	Justified superfluous reports to hide critical information	14/7.5%	60/32.2%	49/26.3%	9/4.8%	26/14.0%	30/16.1%
3	Justified a bias by emphasising benefits and downplaying negative aspects	12/6.5%	27/14.5%	20/10.8%	17/9.1%	48/25.8%	62/33.3%
4	Justified predetermined judgments and decisions	10/5.4%	28/15.1%	24/12.9%	15/8.1%	50/26.8%	59/31.7%
5	Justified restrictive involvement of the public in the decision-making	22/11.8%	35/18.8%	31/16.7	13/7.0%	40/21.5%	45/24.2%

The results revealed mixed feelings among the participants regarding EIA's influence in controversial decisions in the oil and gas sector. From Table 7.6, it can be seen that 55.9 per cent (n=186) of the respondents agreed that EIA was used as a political to controversially justify project consent and approval, while 18.8 per cent and 12.4 per cent did not agree that EIA was used to rationalise oil and gas project decisions based on political considerations. Moreover, 59.1 per cent of the respondents agreed that EIA was used to rationalise oil and gas project decisions in a controversial manner by emphasizing the benefits of the oil and gas project proposal and downplaying negative aspects, while 14.5 per cent and 10.8 per cent thought EIA did not report only positive aspects of the project development in the petroleum sector. In contrast, most participants did not agree that the EIA contributed to the controversial justification of superfluous reports to hide critical information and restrict the involvement of the public in decision-making in Nigeria's oil and gas sector. A summary of the response is displayed in Table 7.7 below.

Table 7.7: Summary of J-T test for respondents' perceptions of EIA's influence in controversial decisions

Variable	Statement	Test Statistic (J-T)	Z-value	P-value
Years of Experience	Justified project approval based on political consideration	12611	14.967	0.000
	Justified superfluous reports to hide critical information	12767	15.348	
	Justified a bias by emphasising benefits and downplaying negative aspects	12659.500	15.095	
	Justified predetermined judgments and decisions	12743.500	15.290	
	Justified restrictive involvement of the public in the decision-making	12720	15.071	

As observed in the table above, all the variables produced statistically significant results ($p < .05$). This infers that the perspective of these attributes is sufficiently higher within the years of experience as regards the respondents' perceptions of EIA's influence in controversial decisions in the oil and gas sector. The pairwise comparison conducted showed that all pairs are significant. The significance of these variables infer that they are less conservative in their opinion regarding Respondents' perceptions of EIA's influence in controversial decisions in the oil and gas sector with significance values adjusted by the Bonferroni correction for multiple tests (See Table 7.7).

7.4. Prediction and evaluation impact

Assessment of the environmental effects of the proposed oil and gas project development is the key component of the EIA process as stipulated in Nigeria's EIA policy and legal regime. In this section, the survey participants were asked to give their opinions on the extent to which EIA assessed potential environmental and socio-economic impacts associated with oil and gas exploration and production in Nigeria. A summary of the findings is presented in Table 7.8. The rating of the stakeholders' perceptions was in the order of "Strongly agree", "Agree", "Neutral", "Disagree", "Strongly disagree" and "I don't know". In order to facilitate ease of analysis, the response rates were consolidated and examined as either agree or disagree.

Table 7.8: Extent to which EIA assesses the impact of oil and gas exploration on some indicators

S/N	Indicators	I don't know	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Air pollution	08/4.3%	25/13.4%	46/18.8%	11/5.9%	61/32.8%	46/24.7%
2	Water/marine pollution	10/5.4%	31/16.6%	25/13.4	18/9.7%	44/23.7	58/31.2%
3	Socio-economic livelihood	12/6.5%	36/19.3%	33/17.7%	21/11.3%	39/21.0%	45/24.2%
4	Displacement of flora and fauna	14/7.5%	34/18.3%	31/16.7%	20/10.8%	41/22.0%	46/24.7%
5	Displacement of human population	9/4.8%	38/20.4%	29/15.6%	13/7.9%	47/25.3%	50/26.9%
6	Human health	19/10.2%	32/17.2%	30/16.1%	17/9.1%	39/21.1%	49/26.3%
7	Biodiversity	7/3.7%	36/19.4%	34/18.3%	9/4.8%	46/24.7%	54/29.0%
8	Noise pollution	15/8.1%	44/23.7%	40/21.5%	14/7.5%	35/18.8%	38/20.4%
9	Cultural heritage	6/3.2%	37/20.0	32/17.2%	11/5.9%	43/23.1%	57/30.6%

The data presented in Table 7.8 indicates that 57.5 per cent of respondents believe that EIAs for oil and gas projects effectively identify and evaluate the effects of air pollution. Conversely, 32.2 per cent of participants feel that the impacts of air pollution are not consistently recognized and addressed within the EIA framework. In terms of water and marine pollution, 54.9 per cent of those surveyed reported that the effects of oil and gas drilling on water and marine environments had been acknowledged and anticipated in the EIA process, while 30 per cent expressed the view that such pollution is generally overlooked. Additionally, cultural heritage considerations received a favourable response, with 53.7 per cent of respondents affirming that the potential impacts of oil and gas exploration and production on cultural heritage sites were factored into the impact assessment and evaluation during the EIA process. However, 37.2 per cent of participants voiced doubts regarding the inclusion of cultural heritage in the EIA

assessments.

Table 7.9: Summary of J-T test for the perceptions of EIA's effect on decision-making

Variable	Statement	Test Statistic (J-T)	Z-Value	P-Value
Years of experience	Air pollution	12831	15.527	0.000
	Water/marine pollution	12738	15.228	
	Socio-economic livelihood	12619.500	14.829	
	Displacement of flora and fauna	12654.500	14.914	
	Displacement of the human population	12570	14.783	
	Human health	12727	15.097	
	Biodiversity	12628	14.845	
	Noise pollution	12646	14.915	
	Cultural heritage	12647	14.927	

As observed in Table 7.9 above, all the variables produced statistically significant results ($p < .05$). This infers that the perspective of these attributes is sufficiently higher within the years of experience as regards the extent to which EIA assesses the impact of oil and gas exploration on some indicators. The pairwise comparison conducted showed that all pairs are significant. The significance of these variables infer that they are less conservative in their opinion regarding the extent to which EIA assesses the impact of oil and gas exploration on some indicators with significance values adjusted by the Bonferroni correction for multiple tests.

However, as shown in Table 7.9, the survey findings underscore that not all potential effects of oil and gas development in Nigeria have been thoroughly considered. Participants voiced reasonable disagreements regarding predicting and evaluating deleterious impacts, particularly on human population displacement, human health, flora and fauna and noise pollution. Many respondents asserted that these impacts are often overlooked or inadequately addressed in the EIA process. Despite these concerns, an overarching positive trend emerges, with a majority of participants suggesting that EIA contributed to the prediction and evaluation of the impact of various environmental

components, encompassing physicochemical, ecological and socio-economic dimensions.

7.4.1 Inclusion of a full range of impacts in oil and gas EIAs

Given the arguments in the literature that oil and gas exploration, production and operations often induce direct, indirect and cumulative environmental and social impacts across regional scales, participants were asked for their opinions on the extent to which oil and gas EIAs in Nigeria address these impacts in the decision-making process.

Table 7.10: Inclusion of a range of impacts in the oil and gas EIA process

Range of impacts		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	I don't know
i	Direct impacts	16	25	4	63	78	0%
		8.6%	13.4%	2.2%	33.9%	41.9%	
ii	Indirect impacts	35	39	5	44	54	9
		16.7%	22.0%	2.7%	23.6%	29.0%	4.8%
iii	Cumulative impacts	76	60	10	18	15	7
		40.8%	32.3%	5.4	9.7%	8.1%	3.7%

As presented in Table 7.10, 75.8 per cent (n=186) of the respondents stated that EIA had an impact in the identification and prediction of the direct impact related to oil and gas development, while 22.0 per cent of them indicated pessimistic views about the capacity of EIA to considered the immediate effects of hydrocarbon drilling activities. Regarding the assessment of indirect effects, slightly more than half of the participants, i.e. 52.6 per cent acknowledged that EIA had contributed in assessing such effects that often relate to the oil and gas drilling activities, while 38.7 per cent disagreed that EIA played an effective role in the inclusion of the indirect impacts of oil and gas development. Furthermore, the findings revealed that 73.1 per cent of the respondents strongly disagreed with the notion that EIA in the oil and gas sector was effective in the inclusion of cumulative effects in the EA, while only 11.8 per cent strongly agreed that it had the capacity for the inclusion of long-term cumulative consequences across the regional scale.

Table 7.11: Summary of J-T test inclusion of a range of impacts in the oil and gas EIA process

Variable	Statement	Test statistic (J-T)	Z-value	P-value
Years of experience	Direct impacts	12705	15.133	0.000
	Indirect impacts	12778.500	15.247	
	Cumulative impacts	12873	15.510	

As observed in Table 7.11 above, all the variables produced statistically significant results ($p < .05$). This infers that the perspective of these attributes is sufficiently higher within the years of experience as regards the Inclusion of a full range of impacts in oil and gas EIAs. The pairwise comparison conducted showed that all pairs are significant except 16-20 years/above 20 years with a p-value of 0.341. The significance of these variables infer that they are less conservative in their opinion regarding respondents' perceptions of EIA's influence in controversial decisions in the oil and gas sector with significance values adjusted by the Bonferroni correction for multiple tests.

7.5 Participatory nature of the EIA process

In order to analyse the participatory nature of the EIA process in the oil and gas industry, survey participants were asked to give their opinions. Respondents were provided with four distinct categories to choose from, each representing a different set of stakeholders with an interest in the process and outcomes of the EIA in the petroleum sector. According to the responses, as depicted in Figure 7.6, 32 per cent of the respondents stated that the oil and gas EIAs are expert-driven, 29 per cent said that it is regulatory-driven. In addition, 18 per cent indicated that oil and gas EIAs are developer-driven. Interestingly, only 12 per cent of the respondents perceived the EIA process as community-driven, implying a comparatively lower level of direct influence from residents and affected communities.

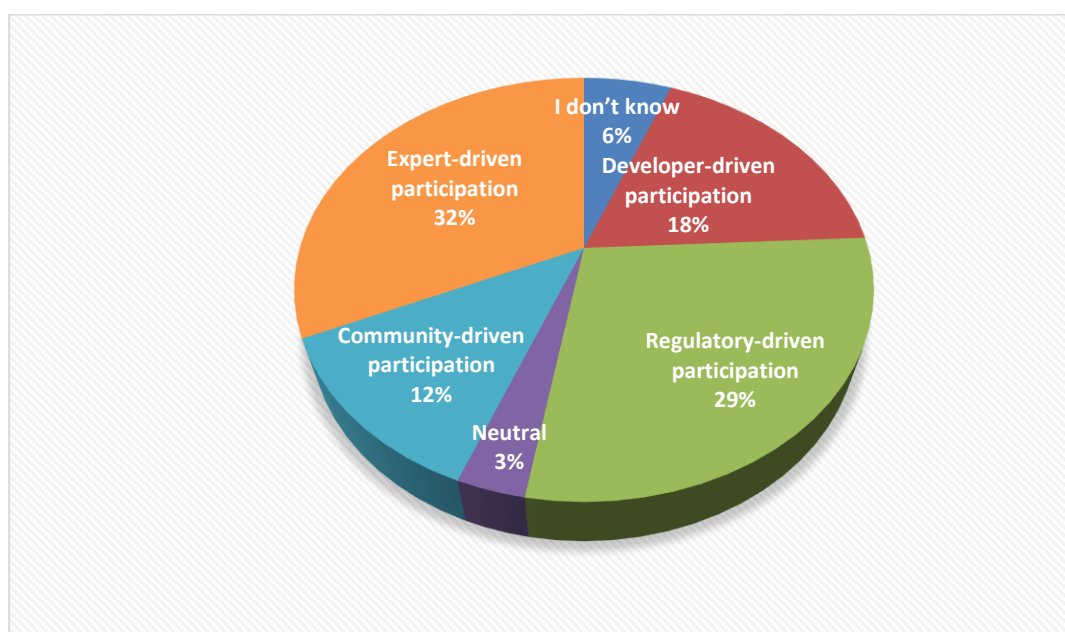


Figure 7.6: Participatory nature of the EIA process

7.6 Barriers to public participation

The survey respondents were asked to state the barriers to public participation in the oil and gas EIAs. According to their response, 61.2 per cent of the respondents identified constraints related to money and time as a prominent barrier to public participation. Additionally, 55.3 per cent highlighted illiteracy as a major hindrance to the public involvement in oil and gas EIAs.

Table 7.12: Barriers to public participation in the EIA process (%)

Barriers	I don't know	Not a significant barrier	Insignificant barrier	Neutral	Significant barrier	Very significant barrier
Physical remoteness	9.1	24.2	22.0	7.0	17.7	20.0
Illiteracy	5.4	15.1	14.0	10.2	24.7	30.6
Cultural differences	0	36.6	29.0	8.1	11.8	4.5
Time/money	4.3	15.6	13.0	5.9	27.4	33.8
Gender representation	6.5	24.7	21.5	9.7	17.2	20.4
Inertia of the locals	1.6	18.3	13.4	11.8	22.6	32.3
Institutional culture of decision-making	9.7	21.0	15.6	7.5	22.0	24.2
Pressure imposed by the project cycle	12.4	29.0	21.5	3.2	16.1	18.3
Legislative ambiguity	17.5	20.4	17.0	4.8	23.7	26.6

Moreover, 54.9 per cent attributed the lack of adequate public participation in the oil and gas EIA process to the inertia of local inhabitants. Other factors received comparatively less attention based on the responses obtained (refer to details in Table 7.12).

Table 7.13: Summary of J-T test for barriers to public participation in the EIA process

Variable	Statement	Test statistic (J-T)	Z-value	P-value
Years of experience	Physical remoteness	12629	14.934	0.000
	Illiteracy	12561	14.921	
	Cultural differences	12646	14.897	
	Time/money	12595	14.821	
	Gender representation	12722.500	15.067	
	Inertia of the locals	12761	15.161	
	Institutional culture of decision-making	12710.500	15.182	
	Pressure imposed by the project cycle	12719	15.127	
	Legislative ambiguity	12676	14.972	

As observed in Table 7.13 above, all the variables produced statistically significant results ($p < .05$). This infers that the perspective of these attributes is sufficiently higher within the years of experience as regards the barriers to public participation in the EIA process. The pairwise comparison showed that all pairs are significant except 16-20 years/above 20 years with a p-value of 0.112. The significance of these variables infer that they are less conservative in their opinion regarding the barriers to public participation in the EIA process with significance values adjusted by the Bonferroni correction for multiple tests.

7.7 Respondents perception of EIA limitations

The respondents also answered questions regarding the perceived limitations of the current EIA system and practice in the oil and gas industry. The respondents were presented with four key areas from which to select their preferences regarding the EIA limitations in the order of "Strongly agree", "Agree", "Neutral", "Disagree", "Strongly disagree", and "I don't know".

Table 7.14: Summary responses on EIA limitations (Percentage %)

EIA limitations	I don't know	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
i. Reactive to planning and decision-making	6.7	16.7	19.9	5.9	22.5	28.3
ii. Short-termism and narrowly focused	8.6	18.2	15.0	9.7	21.5	27.0
iii. Cannot assess alternative options	8.0	15.6	11.8	2.2	28.5	33.9
iv. Cannot address regional and cumulative impacts	5.9	22.3	18.9	0	23.6	29.3

As illustrated in Table 7.14, the response trends indicated that 50.8 per cent of the survey respondents agreed that the EIA tool is predominantly reactive to planning and decision-making processes in the oil and gas industry. Furthermore, about 62.4 per cent agreed that the EIA often falls short in assessing alternatives, and 52.9 per cent expressed agreement that it is inadequate in accounting for regional and cumulative environmental impacts associated with oil and gas development in Nigeria. Short-termism and a narrow

focus were identified as another key limitation of the current EIA practice in the petroleum sector (See detail in Table 7.14).

Table 7.15: Summary of J-T test for respondents' perception of EIA limitations

Variable	Statements	Test statistic (J-T)	Z-value	P-Value
Years of experience	Reactive to planning and decision-making	13005.500	15.886	0.000
	Short-termism and narrowly focused	12629.500	15.108	
	Cannot assess alternative options	12797.500	15.455	
	Cannot address regional and cumulative impacts	13124.500	16.135	

As observed in Table 7.15 above, all the variables produced statistically significant results ($p < .05$). This infers that the perspective of these attributes is sufficiently higher within the years of experience as regards the Respondent's perception of EIA limitations. The pairwise comparison conducted showed that all pairs are significant. The significance of the difference in these variables infers that they are less conservative in their opinion regarding Respondents' perception of EIA limitations with significance values adjusted by the Bonferroni correction for multiple tests.

7.8 Learning outcome in and through EIA

In order to assess the learning outcomes in and through EIA practice in the oil and gas industry, the survey respondents were presented with six key learning takeaways drawn from the literature and were then required to give their opinions on the relevance and applicability of these outcomes to their experiences. More than half of the respondents, representing 55.4 per cent agreed that instrumental learning was acquired in and through EIA practice in the oil and gas industry (See detail in table 7.16).

Table 7.16: Learning outcome in and through EIA (Percentage %)

Learning outcomes		I don't know	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
i.	Instrumental	8.6	14.0	17.2	4.8	25.3	30.1
ii.	Communicative	5.9	16.3	18.5	7.5	23.4	28.3
iii.	Environmental awareness	5.0	8.0	13.4	1.6	33.8	38.2
iv.	Transformative institutional learning	7.5	31.7	22.5	7.5	19.0	11.8

Moreover, 51.7 per cent agreed that the communicative aspect of learning was derived from their involvement in EIA practices related to the oil and gas sector, while 72 per cent stated environmental awareness as an outcome of their participation. Furthermore, only slightly more than one-third of the respondents indicated evidence of transformative institutional learning as a result of EIA practice in Nigeria's oil and gas industry (See detail in table 7.16).

Table 7.17: Summary of J-T test for learning outcome in and through EIA

Variable	Statement	Test statistic (J-T)	Z-value	P-value
Years of experience	Instrumental	12705	15.148	0.000
	Communicative	12748.500	15.337	
	Environmental awareness	12115	14.016	
	Transformative institutional learning	12836.500	15.503	

As observed in Table 7.17 above, all the variables produced statistically significant results ($p < .05$). This infers that the perspective of these attributes is sufficiently higher within the years of experience as regards the Respondents learning outcome in and through EIA. The pairwise comparison showed that all pairs are significant except 16-20 years/above 20 years with a p-value of 0.588. The significance of the difference in these

variables infers that they are less conservative in their opinion regarding their learning outcome in and through EIA with significance values adjusted by the Bonferroni correction for multiple tests.

7.9 Strategic environmental assessment

Having established an overview of the benefits, challenges and limitations associated with project-level EIA in the oil and gas sector in the preceding sections, this section delves into the respondents' opinions regarding the potential of integrating policy-level strategies to supplement the role of project-level regulatory approach in oil and gas planning and development in Nigeria. The following subsections highlight the findings that emerge on SEA themes through the lens of practitioners' perspectives.

7.9.1 General awareness of SEA

As illustrated in Figure 7.7 below, an analysis of the survey responses revealed that 55 per cent of respondents have SEA awareness, acknowledging either a general understanding of SEA, somewhat heard of it, or having some SEA awareness. Conversely, about 17.7 per cent stated that they were unfamiliar with SEA, while 16.1 per cent acknowledged that they were very unfamiliar with the SEA process. These results are particularly intriguing given that SEA has not yet been implemented in Nigeria. As such, it can be deduced that the observed awareness of SEA may not necessarily mean an in-depth knowledge of the nitty gritty of an SEA process. The pie chart below illustrates the findings on general awareness of SEA among the survey participants.

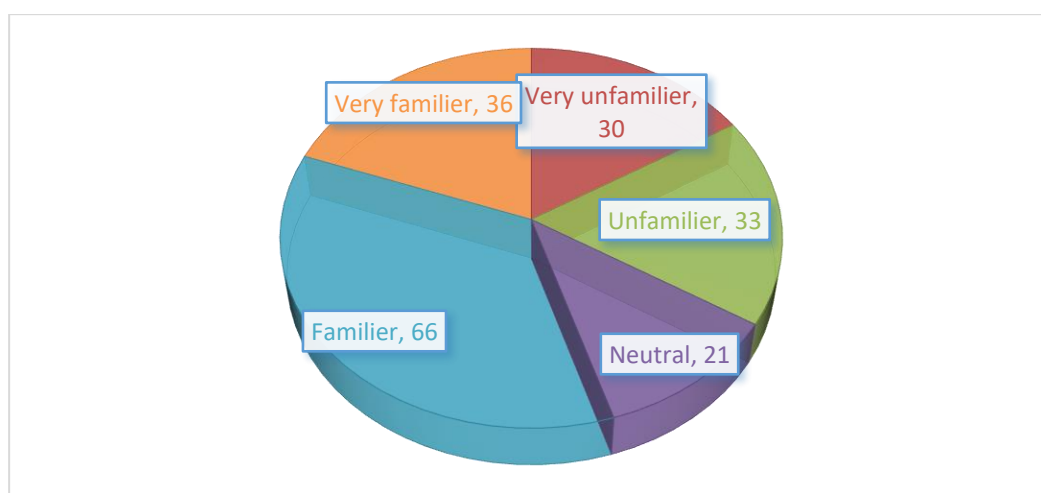


Figure 7.7: Levels of SEA awareness

7.9.2 Acceptance of SEA integration

As depicted in Figure 7.8 below, the majority of the responses, which constituted 56.6 per cent of the survey respondents strongly supported the integration of SEA for environmental assessment of higher-level strategies in the oil and gas industry. Similarly, 19.9 per cent strongly disagreed, while some 13.9 per cent disagreed with the idea of mainstreaming SEA into the petroleum sector. The finding is perhaps not surprising considering the lack of a strategic approach to help drive Nigeria's oil and gas decision process towards more sustainable outcomes. This could be the main reason most professionals recommend considering the SEA system in the petroleum sector. Hence, Figure 7.8 below crystallises a positive trend in the acceptance and recommendation of the SEA approach to planning and impact assessment to be mainstream into Nigeria's oil and gas policy sector.

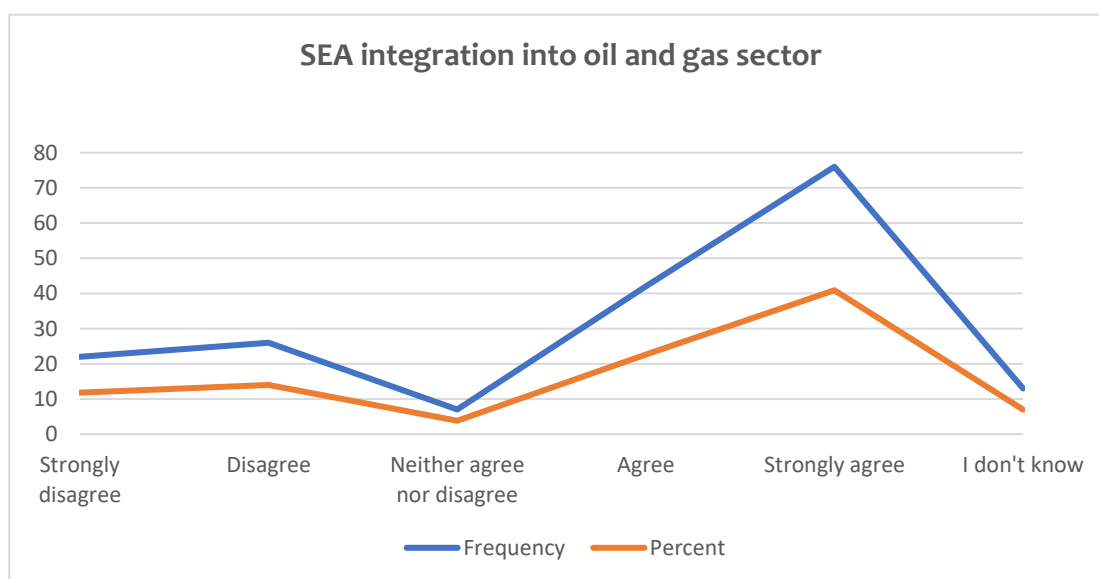


Figure 7.8: Acceptance of SEA integration

7.9.3 Potential of SEA to strengthen EIA shortcomings

The professionals were asked to state their opinions about the likely potential of SEA to strengthen EIA shortcomings. As shown in Figure 7.9 below, 66.7 per cent (n=186) of the respondents expressed confidence in SEA's potential to strengthen and address the limitations of the existing EIA approach. Conversely, almost one-third of the respondents, constituting 24.6 per cent were sceptical about SEA's capacity to strengthen and obviate the limitations of EIA, while approximately 4.3 per cent of the respondents appeared indifferent to the matter. The findings illustrate that many professionals regarded SEA as vital in offsetting and/or strengthening EIA shortcomings in Nigeria's oil and gas policy and planning. This survey outcome is perhaps not surprising because project EIA in Nigeria overlooks a range of cumulative and regional impacts of oil and gas development within the same ecological footprint, including subsidiary factors that stimulate other potential activities which could induce long-term impacts. In light of this, it can be concluded that the survey findings have revealed a positive trend in accepting an SEA as a potential instrument that can help strengthen the project-level EIA in the oil and gas sector. Figure 7.9 below shows the trends of responses.

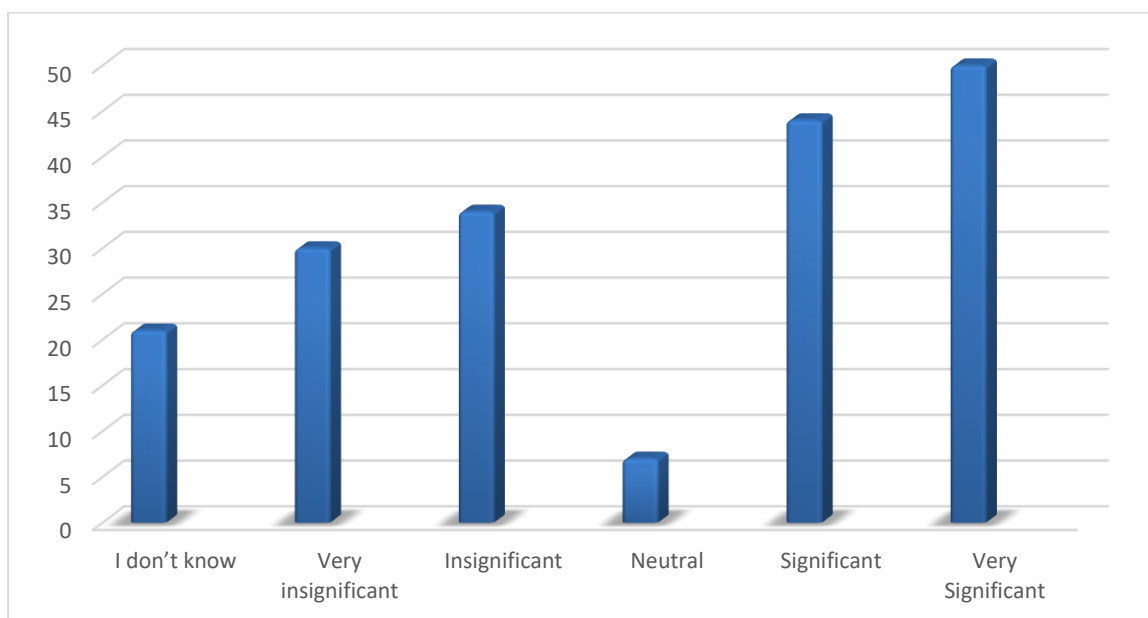


Figure 7.9: Potential of SEA to strengthen EIA shortcomings

7.9.4 Potential benefits of integrating SEA

The survey respondents were asked to indicate their views regarding the potential benefits of integrating an SEA approach to planning and impact assessment in Nigeria's oil and gas policy sector. The response trends unveiled compelling insights, with 51.1 per cent of respondents indicating their agreement that mainstreaming SEA could potentially enable the formulation of strategic PPPs in the petroleum industry. Additionally, 50.5 per cent said that SEA could help promote environmental thinking in PPP-making, while 50.6 per cent believed it could facilitate the comprehensive evaluation of broader cumulative environmental impacts linked to oil and gas development.

Table 7.18: Summary responses of potential benefits of integrating SEA (%)

	Benefits	I don't know	Not improved	Moderately improved	Neutral	Improved	Strongly improved
i.	Develop strategic PPPs	10.2	15.1	18.2	5.4	22.6	28.5
ii.	Promote environmental thinking in PPP-making	10.8	14.5	17.7	6.5	24.2	26.3
iii.	Evaluation of broader cumulative impact	8.6	16.1	18.8	5.9	23.6	27.0
iv.	Better consideration of alternatives	7.5	13.0	17.2	9.7	22.0	30.6
v.	Promote regional and	10.7	13.4	16.6	4.8	25.2	29.0

	strategic coordination						
vi.	Promote public participation	12.4	17.2	15.6	9.1	20.4	25.3
vii.	Strengthen project-based EIA assessment	10.	12.4	17.7	6.9	22.6	29.6
viii.	Institutional co-ordination	11.8	15.6	18.2	8.6	19.8	25.8

Furthermore, responses suggested that integrating an SEA approach could enhance the consideration of alternatives (50.6%), foster regional and strategic coordination (45.7%), and fortify project-based EIA processes (52.2%). These findings underscore the multifaceted advantages anticipated by respondents, indicating a consensus on the potential positive outcomes associated with incorporating SEA into the planning and impact assessment framework for the oil and gas industry in Nigeria.

Table 7.19: Summary of J-T test for potential benefits of integrating SEA

Variable	Statement	Test statistic (J-T)	Z-value	P-value
Years of experience	Develop strategic PPPs	12684	15.043	0.000
	Promote environmental thinking in PPP-making	12669.500	14.985	
	Evaluation of broader cumulative impact	12626	14.891	
	Better consideration of alternatives	12750	15.229	
	Promote regional and strategic coordination	12705.500	15.126	
	Promote public participation	12714	15.046	
	Strengthen project-based EIA assessment	12727	15.157	
	Institutional coordination	12712.500	15.123	

As observed in the table above, all the variables produced statistically significant results ($p < .05$). This infers that the perspective of these attributes is sufficiently higher within the years of experience as regards the potential benefits of integrating SEA. The pairwise comparison showed that all pairs are significant except 16-20 years/above 20 years with a p-value of 0.115. The significance of these variables infers that they are less conservative in their opinion regarding the potential benefits of integrating SEA with significance values adjusted by the Bonferroni correction for multiple tests.

7.9.5 Potential drivers of SEA integration

The survey respondents were asked to express their opinions on the potential drivers that could accelerate the integration of an SEA approach to planning and impact assessment in Nigeria's oil and gas policy sector. The respondents were presented with seven potential drivers from which to select their preferences in the order of "Very significant driver", "Significant driver", "Neutral", "Insignificant driver", "Very insignificant driver", and "I don't know". A majority of respondents, comprising 52.7 per cent had acknowledged that sustainability considerations could be a significant driver that could facilitate a transition toward a strategic approach to planning and impact assessment in Nigeria's oil and gas policy sector. Additionally, almost half of the respondents, totaling 48.9 per cent identified growing environmental awareness as a potential motive that could promote the adoption of an SEA. Moreover, 48.3 per cent of respondents pointed to the increasing demands for SEA implementation as a pre-condition for funding oil and gas development by the international multi-lateral and bilateral lending agencies, which would likely drive SEA mainstreaming into the oil and gas policy sector (See Table 7.20).

Table 7.20: Summary responses of potential drivers of SEA integration (Percentage %)

SEA drivers	I don't know	Very insignificant driver	Insignificant driver	Neutral	Significant driver	Very significant driver
Sustainability consideration	8.6	15.1	18.8	4.8	21.5	31.2
Environmental awareness	3.8	16.1	17.7	13.4	22.6	26.3
International multilateral and bilateral lending agencies	13.0	15.0	17.2	6.5	21.5	26.8
Climate change concerns	7.5	11.3	15.6	10.2	24.2	31.2
Endogenous pressure of EIA institutional actors	10.8	22.0	26.9	7.0	15.1	18.2
Developers	8.1	30.1	23.1	9.7	11.2	15.6
Resistance to environmental pollution by locals/ENGOS	6.5	30.6	14.0	10.8	21.5	16.6

Furthermore, a substantial 55.4 per cent of the respondents suggested that the growing concerns related to climate change may likely be the significant driver to integrating a strategic approach to planning and upstream assessment in the oil and gas sector. The remaining factors (refer to Table 7.20) received comparatively less consideration from the survey respondents, indicating that they are less likely to be influential drivers for SEA integration in the petroleum industry.

Table 7.21: Summary of J-T test for potential drivers of SEA integration

Variable	Statement	Test Statistic (J-T)	Z-value	P-value
Years of experience	Sustainability consideration	12762	15.059	0.000
	Environmental awareness	12671	14.985	
	International multilateral and bilateral lending agencies	12550.500	14.721	
	Climate change concerns	12781	15.332	
	Endogenous pressure of EIA institutional actors	13000	15.796	
	Developers	13011.500	15.871	
	Resistance to environmental pollution by locals/ENGOS	12746.500	15.217	

As observed in Table 7.21 above, all the variables produced statistically significant results ($p < .05$). This infers that the perspective of these attributes is sufficiently higher within the years of experience as regards the potential drivers of SEA integration. The pairwise comparison conducted showed that all pairs are significant. The significance of the difference in these variables infers that they are less conservative in their opinion regarding the potential drivers of SEA integration with significance values adjusted by the Bonferroni correction for multiple tests.

7.9.6 Model for SEA integration

The survey respondents were asked to indicate their views regarding the way and model for integrating an SEA into planning and impact assessment in Nigeria's oil and gas industry. The survey respondents were asked to indicate their opinions in the order of "Very likely", "Likely ", "Neutral", " Unlikely ", " Very unlikely", and "I don't know". As cumulatively shown in Table 7.22 below, 49.5 per cent of the survey respondents indicated integration of SEA as a distinct exercise and a likely model to mainstream a strategic approach to planning and impact assessment in Nigeria's oil and gas policy sector.

Table 7.22: Model for SEA integration (percentage %)

SEA model	I don't know	Very unlikely	Unlikely	Neutral	Likely	Very likely
SEA runs concurrent but independently from PPP	8.1	27.4	23.6	6.0	16.1	18.8
SEA as a distinct exercise	10.2	15.1	20.4	8.1	21.5	28.0
SEA as an integral part of PPP formulation	12.4	16.6	19.4	3.2	21.5	26.9
The same EIA approach	9.1	25.3	22.6	10.8	17.7	14.5

In the same vein, 48.4 per cent favoured integrating SEA as an integral part of PPP formulation. In addition, 34.8 per cent of the respondents believed that SEA should be mainstream to run concurrently but independently of the PPP formulation while integrating an SEA as the EIA-based approach was rated the least by the respondents (See Table 7.22). The SEA integration was modelled using the kernel regression model from STATA Version 21.

The STATA CODE is as follows:

```
. data
. npregress kernel a b c d year, reps(400) seed(12)
```

(running npregress on estimation sample)

Bootstrap replications (400)

```
----- 1 ----- 2 ----- 3 ----- 4 ----- 5
```

(output omitted)

Bandwidth

Table 7.23: Mean scores for the model of SEA integration

	Mean	Effect
SEA as a distinct exercise	1.057869	1.32024
SEA as an integral part of PPP formulation	1.025779	1.28019
The same EIA approach	0.764092	0.9536005
Years of EIA Experience	0.4727232	0.589967

Local-linear regression Number of obs = 186

Kernel : epanechnikov E(Kernel obs) = 61

Bandwidth: cross-validation R-squared = 0.9483

Table 7.24: Summary of estimates for SEA integration

	Observed	Bootstrap			Percentile	
SEA runs concurrent but independently from PPP	Estimate Interval]	Std. Err.	z	P> z	[95% Conf.	
Mean						
SEA runs concurrent but independently from PPP	2.0318	0.2790	7.28	0.000	1.4099	2.3717
Effect						
SEA as a distinct exercise	0.0766	0.0422	1.82	0.069	-0.0069	0.1368
SEA as an integral part of PPP formulation	-0.0135	0.0104	-1.30	0.195	-0.0369	0.0041
The same EIA approach	0.6342	0.1382	4.59	0.000	0.4684	1.0074
Years of EIA experience	0.2447	0.1609	1.52	0.128	-0.0944	0.5462

Note: Effect estimates are averages of derivatives.

From the above results of kernel regression, the regression model was statistically significant, with the coefficient of determination R^2 at 94.83 per cent, indicating that the model is good and that about 95 per cent of changes in SEA integration are well explained by the identified variables. The average of the observation-level predicted (SEA runs concurrent but independently from PPP, SEA as a distinct exercise, SEA as an integral part of PPP formulation. The same EIA approach is 2.03, 0.08, -0.01, 0.63, respectively. The average of the observation-level marginal effects (year of EIA Experience) is 0.24, which indicates that increasing year of EIA Experience increases the mean of SEA runs concurrent but independently from PPP, SEA as a distinct exercise, and The same EIA approach while increasing year of EIA Experience decreases the mean of SEA as an integral part of PPP formulation.

7.9.7 Barriers to SEA integration into the oil and gas sector

To obtain the opinions of the respondents concerning the major barriers to the integration of SEA into Nigeria's oil and gas policy sector, they were given four key factors and asked to indicate their significance or otherwise.

Table 7.25: Barriers to SEA integration into the oil and gas sector

Barriers	I don't know	Not a significant barrier	Insignificant barrier	Neutral	Significant barrier	Very significant barrier
Lack of SEA legislation	6.0	26.8	24.7	7.5	15.6	19.4
Lack of political will	6.9	15.0	11.0	2.7	26.3	38.1
Institutional culture of EIA regime	3.8	11.8	18.2	5.9	23.7	36.6
Lack of SEA expertise	8.1	15.1	17.7	11.3	22.0	25.8

The survey respondents saw the lack of political will as the major barrier to the integration of the SEA approach to planning and impact assessment in Nigeria's oil and gas policy sector. About 60.3 per cent of the respondents perceived the institutional culture of the EIA regime as the next potential barrier to SEA integration. 47.8 per cent of the respondents stated a lack of SEA expertise, while 35.0 per cent indicated a lack of SEA legislation (See Table 7.25).

Table 7.26: Summary of J-T test for Barriers to SEA integration

Variable	Statement	Test statistic (J-T)	Z-value	P-value
Years of experience	Lack of SEA legislation	12978.500	15.777	0.000
	Lack of political will	12667.500	14.949	
	Institutional culture of EIA regime	12655.500	14.954	
	Lack of SEA expertise	8510.500	13.944	

As observed in Table 7.26 above, all the variables produced statistically significant results ($p < .05$). This infers that the perspective of these attributes is sufficiently higher within the years of experience as regards the barriers to SEA integration into the oil and gas sector. The pairwise comparison conducted showed that all pairs are significant. The significance of the difference in these variables infers that they are less conservative in their opinion regarding the barriers to SEA integration into the oil and gas sector with significance values adjusted by the Bonferroni correction for multiple tests.

7.10 Chapter Summary

This chapter presented and interpreted the results of the EIA practitioners undertaken as part of the quantitative data collection method adopted in this study. The findings explored the practitioner's perceptions of the EIA practice in the oil and gas industry. Respondents indicated that the EIA practice was instrumental in informing decisions about the potential impacts of proposed project development and enabling the developers to adopt the appropriate mitigation measures. Notwithstanding the crucial role of the EIA in the petroleum sector, most of the survey respondents identified limitations associated with such an approach to environmental planning and decision-making within the industry. Among the identified limitations were the reactive nature of EIA processes and the perceived inadequacy in addressing the cumulative and regional effects of oil and gas development. Operational challenges were also highlighted, indicating that the EIA tool is often used to rationalise controversial oil and as an EIA approach within the petroleum industry, with attendant deleterious impacts on the

environment.

The findings in this chapter indicated that respondents showed a certain degree of SEA awareness. This led some respondents to recommend integrating the approach into planning and decision-making, including identifying the potential drivers that can enable the uptake of an SEA process in the petroleum sector. They indicated that the SEA might help strengthen and solve some of the limitations associated with the project-driven EIA. However, it was found that the prospects of integrating an SEA into Nigeria's oil and as a policy sector may likely be constrained by a lack of technical know-how knowledge, a well-established EIA practice and political will. Addressing these potential barriers is critical to the adoption of the SEA process in the oil and gas industry.

CHAPTER EIGHT

Interview Analysis and Results

8.1 Introduction

The results of the semi-structured interviews are presented analytically based on the multi-level perspectives of the transition processes: regime, landscape influences and niche innovations in this chapter. The first section presents the participant's perception of the existing EIA regime in Nigeria's oil and gas sector. It explores the current state of EIA practice in the old frontier of oil and gas exploration and development in the Niger Delta region, the EIA institutional and regulatory framework, path-dependencies and lock-ins in environmental management, as well as public consultation and participation. The section further highlights the limitations of the current practice of EIA in the oil and gas sector and the need for a shift toward a more strategic approach as attention turns to opening the new frontier to potential hydrocarbon exploration and development. Likewise, the section discusses the awareness and acceptance of a more strategic approach to planning and environmental assessment in the petroleum industry. The next section reports on participants' perceptions of the potential landscape influences or critical decision factors that could help facilitate a strategic transition. The third section examines the prospects of the niche maturing and opening up to SEA innovation, including potential barriers to advancing a more strategic approach to oil and gas planning, regulation and development in Nigeria. In cases where research participants did not want their opinions or remarks attributed to their department, they are generally referred to by the broader organisations with which they are affiliated.

8.2 The EIA regime in the oil and gas industry

As noted earlier in this study, the EIA has been institutionalised as an appropriate regulatory management regime to mitigate the environmental challenges posed by oil and gas exploration and development in Nigeria's old frontier in the Niger Delta region for more than three decades. As such, in initiating the interviews, the starting point was to establish the participants' perspectives surrounding environmental protection and management in the prevailing EIA practice in the oil and gas sector, particularly the

efficacy of the EIA in working towards better environmental decision-making – and what they considered to be working well with regard to EIA in the Niger Delta region. The trends of perception among the participants interviewed differed markedly between in the study. Government officials and oil and gas industry participants were optimistic about the EIA's role in facilitating sound environmental decision-making in the oil and gas industry. In contrast, participants affiliated with environmental non-governmental organisations, multi-lateral development organisations or financial institutions, academic experts and local village heads tend to be pessimistic regarding the contribution made by EIA in promoting better environmental management decisions in the petroleum industry.

Presented with the question regarding the prevailing EIA practice in the oil and gas industry, the opening response emerged from the Federal Ministry of Petroleum Resources official who noted that:

"It will interest you to know that the federal government did not pay much attention to assessing the environmental impact of oil and gas project development before the promulgation of EIA regulation in 1992, even though an environmental management protocol similar to EIA has been used in Nigeria since 1969 in the form of cost-benefit analysis. However, a lot has changed since then, and the formal use of EIA has now become an industry logo as well as a yardstick for environmental regulatory processes in the oil and gas sector"—Participant (A)

In trying to shed more light on the centrality of EIA as an appropriate management response to the environmental consequences posed by activities of oil and gas development in the Niger Delta region, the participant further explained that:

"The project-level EIA has improved the level of environmental accountability in terms of predicting and understanding the impact of proposed oil and gas project development in the Niger Delta region compared to the 1960s, 70s or even 80s before the EIA promulgation in the 90s"—Participant (A)

In affirmation of the above comment, an oil and gas industry participant further added that:

"The potential impacts project development considered under the current EIA practice in the oil and gas industry include the positive or negative"—
Participant (O)

In terms of the main effect of EIA on decision-making, research participants, mostly regulators and developers suggested that EIA had led to explicit consideration of the environmental factors in decision-making, leading to significant changes in the design and planning of oil and gas project development. It was noted that the use of baseline ecological information collected through the EIA process as a raw data input or source is fundamental to understanding how oil and gas project development could alter ecological composition in the Niger Delta region. The participants felt that the information generated by the EIA process plays an active and influential role in establishing environmental baseline conditions and quantifying the potential change the hydrocarbon developments may cause to the ecological environment. The following quotes succinctly illustrate the participant's views:

"I believe that environmental issues are part and parcel of everything (decision-making)... it is at the heart of what the Ministry does, of what we scrutinise"—Participant (D)

"The EIA process provides the regulatory authorities and developers with information on how an ecological baseline condition may change in response to oil and gas project exploration and development in the Niger Delta region before issuing drilling and production licenses to developers"—
Participant (B)

"The ecological information produce through the EIA process contributes to the early stages of decision-making in terms of predicting or identifying the impacts of oil and gas project developments... let's say to the biodiversity in the Niger Delta region"—Participant (N)

"If you look at in recent years, there have been changes in terms of oil and

gas projects proposal submitted by the developers... we reviewed the scope of project design and where applicable, we recommend for modification before final approval"—Participant (B)

"I am not claiming the changes made to the oil and gas project is perfect; nothing is ever perfect, but the regulatory agencies do review or recommend changes to proposals submitted by the proponents from time to time"—Participant (A)

There were also some suggestions by interviewees that the role of EIA practice extends beyond merely supplying ecological data to predict the potential environmental impact of hydrocarbon development or modified proposed project designs. They highlighted that EIA serves as a crucial medium for formulating and implementing mitigation measures to address significant challenges identified during the project design phase. For instance, two research participants from the government establishment spoke to the idea of EIA as an overarching framework or medium to formulate and manage the operationalisation of mitigation measures.

"The EIA regime provides a regulatory fall-back position which enables the consenting authority to ensure that beyond the developers identifying and accounting for any potential impact of oil and gas project development, they should also develop a set of mitigation measures to mitigate the negative effects of their hydrocarbon exploration and production activities on the environment"—Participant (C)

"The EIA practice has been instrumental... because it set the stage for not only identifying potential impacts that oil and gas development initiative may cause to the environment... It also provides a platform for the developers to design a set of mitigation measures that must be implemented to mitigate the negative effects of their activities"—Participant (F)

The research participants were also asked to provide their perspectives on the extent to which the current EIA practice has contributed to environmental awareness in the

petroleum sector. Some participants suggested that the EIA process has played a significant role in fostering a culture of environmental consciousness, particularly among both proponents and regulatory authorities. For example, one participant from the competent authorities claimed that:

"The EIA regulations have raised environmental awareness in the petroleum sector to some extent...many developers are made to understand how important it is to document the potential effects of hydrocarbon extraction, installation of pipelines, construction of modular refinery, flow stations or depots"— Participant **(B)**

Another industry participant also appears to agree with the above submission made by a participant from the competent authorities that the EIA practice has improved the thresholds of environmental awareness among the key stakeholders in Nigeria's petroleum sector. The comment below conveys the participant's claims:

"I believe the existing EIA regulatory regime is responsible for improved levels of environmental awareness among the developers in the oil and gas industry"— Participant **(O)**

Building on the above insights, participants were asked whether the improved environmental awareness fostered by the EIA process has effectively contributed to environmental protection in the oil-producing communities within the Niger Delta region. Most participants affiliated with the competent authorities seemed to be indifferent or avoided directly addressing this question — except one individual who acknowledged that:

"Well, for me, the idea of EIA practice in the oil and gas communities in the Niger Delta region contributing to environmental management and protection in a mixed feeling of both positive and negative..."—Participant **(B)**

However, despite this foregoing response, surprisingly, an interviewee from the industry claimed that the current EIA practice has indeed contributed to safeguarding the environment in the Niger Delta region. The participant's comment is succinctly reported below:

"Let's be frank —can you even imagine the level of environmental degradation that would occur in the oil-producing communities of the Niger Delta without the EIA regulatory regime? I think the EIA practice helped protect the environment in these communities, especially given how the hydrocarbon projects operate in a large network of infrastructure and the risks to the ecological environment"—Participant (N)

It is evident from the trend of responses that while some industry actors may view the current EIA practices as contributing positively to environmental protection, regulators appear to be less convinced of its efficacy in translating to tangible environmental protection in the oil-producing communities within the Niger Delta region. This contrast raises critical questions about the efficacy and perception of EIA practice in promoting sustainable environmental management in the Niger Delta region, including how the oil and gas EIA-related processes are implemented and perceived among the different stakeholders.

In addition, there were several additional observations regarding the value of the existing EIA practice in Nigeria's oil and gas sector. Several interviewees highlighted the utility of EIA in improving consultation and engagement among the stakeholders in the oil and gas industry. As noted by one federal government official:

"The EIA regulations have improved the level of communication between regulators and developers. It provides an opportunity to meet with proponents to thoroughly understand the scope of the project development and identify various challenges to reach a consensus... I can confidently state that developers in the oil and gas industry are no longer compelled; instead, we have established an effective communication mechanism that fosters collaboration between regulators and developers."—Participant (D)

The above submission resonates with an oil and gas industry participant who concurs that the current EIA practice is beneficial in creating a common wavelength of thought between developers and regulators in the petroleum sector by claiming that:

"The EIA promotes good consultation and engagement between regulators

and proponents in environmental regulatory and management processes in the oil and gas sector"—Participant (N)

However, in order to contrast the views of the government regulatory officials and proponents alike regarding the efficacy or centrality of EIA to oil and gas environmental management, other relevant stakeholders with interest and experience in the petroleum sector were asked the same questions. Interestingly, there was a significant exception despite the overwhelmingly favourable commentaries among regulators and industry participants that characterised EIA as a positive-constructive force in the environmental decision-making process in the oil and gas industry. For instance, one ENGO participant said that:

"With the nature and scale of environmental challenges in the Niger Delta region, I do not think the EIA adequately reconcile environmental quality and oil and gas development in the decision-making process"—Participant (Q)

A similar pessimistic view was echoed by a participant from the United Nations Environment Programme, who noted that:

"There has been a credibility crisis or low confidence in the EIA practice in the Niger Delta region because the locals often see it as not having a positive effect on the environmental decision-making process to help protect their environment and livelihoods from the negative impacts of hydrocarbon extraction and development"—Participant (U)

Another research participant, a member of the Friends of the Earth, Nigeria, stated that:

"I do not think environmental issues or components form part of the decisive process in the oil and gas EIAs"—Participant (R)

The above commentary was further crystallised by a participant from the Nigerian Conservation Foundation (NCF), who claimed that:

"I do not think the EIA is working toward better environmental decisions to protect the environment... particularly when one takes into account the

ongoing environmental degradation in the oil-producing communities in the Niger Delta region”—Participant (I)

Probing further about the current state of practice of project-level EIA, particularly what the interviewees considered to be working well with regard to environmental assessment for oil and gas development in the Niger Delta region – a similar disappointment was echoed by an ENGO participant from the Nigerian Coalition for Gas and Oil in the Niger Delta (NACGOND), who opined that:

"EIA does not seem to inform sound environmental decisions or actions capable of ensuring that extraction and production of hydrocarbon resources do not cause a significant impact on the ancestral land and economic livelihood of local inhabitants living close to the site of the operations"—Participant (S)

Moreover, one of the research participants added that the efficacy or performance of the EIA for oil and gas appears to be unsatisfactory in the Niger Delta region in terms of environmental management and protection:

"When it comes to the protection of the sensitive ecological environment, I don't think the EIA is pretty much effective or has worked except in favour of oil companies....I said this because year-in-year, the environmental problems are undoubtedly on the rise, and the people's sources of livelihood are being destroyed by the activities of oil and gas development in the Niger Delta region"— Participant (R)

Building on the above insight, a research participant with knowledge of environmental sustainability argued that:

"I don't think the EIA adequately promotes environmental accountability in the petroleum sector; this is because when you have a situation in which the local inhabitants have been told that the projects go through environmental assessment or screening to mitigate the negative aspects associated with those activities. However, over the years, hydrocarbon development has turned out to be more environmentally harmful to their

environment....look at the continuous biodiversity loss, gas flaring, pollution of water and destruction of farmland, which is the main source of livelihood for the community members in the region"— Participant (L)

In sum, the findings present a nuanced perspective on environmental protection and management within Nigeria's prevailing EIA practice in the oil and gas sector. Government officials and industry proponents expressed optimism regarding the EIA's role in facilitating sound environmental decision-making. They believe that the EIA process contributes positively to environmental management practices in the oil and gas industry. However, this optimism was not universally shared. Participants affiliated with environmental NGOs, multilateral and development institutions, academic experts and local village leaders were more critical. These groups tended to be pessimistic about the EIA's effectiveness in promoting environmental accountability and questioned its capacity to drive better environmental management decisions within the petroleum industry. This divergence of views highlights ongoing challenges in achieving robust environmental governance in Nigeria's oil and gas sector.

8.2.1 Institutional context and regulatory framework

The current EIA regulatory regime in Nigeria's petroleum industry operates based on a dual-track EIA system. Any oil company or developer willing to undertake major project (s) development in Nigeria's oil and gas sector is required to obtain an EIA permit or approval from both the Nigerian Upstream Petroleum Regulatory Commission (NUPRC), formerly the Department of Petroleum Resources (DPR) and the Federal Ministry of Environment (FME). Research participants argued that this arrangement represents a patchwork regulatory system that promotes rigid bureaucracy, duplicative EIA-related processes, delays, excessive financial costs and increased delays in the approval procedure, all of which undermine the efficiency of the oil and gas EIA process. As described by some participants:

"...It is an open secret that we have twin EIA processes in the petroleum sector... the government set up a system that requires an EIA report to be submitted to the Federal Ministry of the Environment and a separate one to the Department of Petroleum Resources. I think this system in many ways promotes duplication and overlap of task and responsibilities in the conduct

of the EIA process"—participant (P)

"...the overlapping roles and responsibilities between the FME and DPR means that there are two power blocks with different requirements that a developer must fulfil within the same sector....when you produce an EIA, you give it to FME...prepare another draft and send it to DPR...getting the outcome of the EIA takes a long period due to this bureaucratic hurdles. This, in my opinion, slows the project approval plan"—Participant (K)

Closely related to the above, another commonly identified challenge specific to the dual-track EIA system is the enormous cost of sponsoring an oil and gas EIA to meet the multiple permitting regulatory requirements. As pointed out by industry participants:

"...of course, the duplicative EIA-related processes have created a problematic situation for developers to spend a lot of funds to employ consultants to prepare two sets of EIA reports... I can tell you many developers in the oil industry are complaining that the current EIA system is too cumbersome, expensive and time-consuming"—Participant (O)

"The twin EIA system has led to delays, inefficiency, increased cost and in many cases promote corruption"—Participant (N)

Although the Ministry of the Environment is required by extant statute to collaborate with the DPR on certain issues regarding environmental management, the degree to which this form of collaboration takes place remains problematic and blurred. Research participants stated that the current institutional and regulatory framework is plagued by conflicts of interest, power-play, politics, bureaucracy and egocentrism, which often foster intra-organisational discord. For example, the complexity of power play was explained by a participant from the Association for Environmental Impact Assessment of Nigeria, as illustrated below:

"...whether by commission or omission, the government has established parallel entities that are not part of the same Ministry...let me explain the complexities to you... the Ministry of the Environment has always believed

that, as a full-fledged Ministry with a mandate for environmental management and protection in Nigeria, it cannot be subordinate to the Department of Petroleum Resources, which is an agency under the Ministry of Petroleum Resources....on the other hand, the DPR believes that oil and gas matters are an integral part of their Ministry's identity...This cold war among the government agencies has overshadowed the conduct of the EIA-related processes within the petroleum sector with a serious negative impact on the overall goal of environmental management"—Participant (K)

Unsurprisingly, the issue of power relations and dynamics within the EIA institutional framework presents a significant challenge in achieving a well-integrated EIA-related process in the oil and gas industry. Participants opined that the discordant and rivalries over the ambiguous jurisdictional mandate in the institutional context created an atmosphere where the government agency works in silos or two different universes. It is argued that the dual-track EIA approach does not facilitate coordination across the regulatory organisations—resulting in limited sharing and harmonising of qualitative and quantitative ecological data collected under two distinct EIA processes that could be transformed into quantitative data to understand and offset environmental challenges in the petroleum sector owing to a lack of inter-agency collaboration and synergy. A number of research participants expressed concern about the lack of communication among regulators within the EIA institutional arrangements. The following quotes convey the participant's point of view:

"The two EIA regulatory institutions within the petroleum sector operate in isolation without adequate collaboration in oil and gas EIA-related processes"—Participant (H)

"...there is a huge communication gap across the government agencies conducting oil and gas EIAs in the oil and gas sector, and it is often difficult to get all the relevant actors around a table to share information about the proposed project development EIA reports....I do not see the merit of having the two agencies in place if institutional collaboration cannot be achieved"—Participant (V)

"...there is an absence of coordination among the regulatory actors. This could be the reason why the government agencies do not want to integrate environmental information about oil and gas development right from the screening and approval because of the money involved in this lucrative [oil and gas] sector"—Participant (R)

In sharp contrast, however, a government official from the Federal Ministry of Environment took a defensive stance when questioned about the perceived lack of well-integrated information on environmental assessments for oil and gas project proposals between the two regulatory organizations. The official cited an example where the Ministry of Environment attempted to share EIA information with the Department of Petroleum Resources, but their efforts were unsuccessful. The participant cited the following scenario:

"The DPR officials do not often see us as friendly partners in the environmental management of oil and gas development. As a ministry, we have tried to have some level of understanding and synergy by sharing information on certain project developments in the oil-producing communities, but it did not work...our ministry then continues to do its own separate EIA for developers. I believe part of the difficulty we have is that the Petroleum Resources Department rely on the EGASPIN guidelines empowered it to conduct EIA separately from our organisation [Federal Ministry of the Environment] backed by an EIA Act... that is another layer of bureaucracy and confusion in my view"—Participant (D)

There was, however, a contrasting view from the Department of Petroleum Resources participant who contended that:

"...we [DPR] have been around before the founding of the FME, and in many of our interactions, we had tried to let them know that we are not exclusively dealing with projects in other sectors per se but the activities of oil and gas development on the environment...I think the FME has been gradually invading DPR territory rather than focus on the broader environmental issues"—Participant (B)

Although the FME and DPR EIA methods vary in practice, the two processes share comparable knowledge and operational procedures within the petroleum industry. An interviewee from the ecological think-tank Health of Mother Earth Foundation, illuminating the ongoing power constellation among the regulatory agencies in Nigeria's oil and gas EIA-related processes, provides a modest approach to delegating tasks and obligations to these two regulating authorities.

"...I have always advocated that the ideal situation is for FME to focus on EIA related to the onshore exploration and production while the DPR should be responsible for conducting an EIA in the offshore area...I think territorial mandate and management can promote efficiency in the oil and gas EIA processes and help to address the discrepancies in who does this or that....or merged both agencies."—Participant (Q)

However, it was argued that the current dual EIA regulation in the oil and gas sector is not a hindrance. A participant from the Federal Ministry of Petroleum and Resources claimed the dual-track EIA system has added value to the regulatory process by ensuring there are no loopholes or escape routes for operators to exploit. As such, it cannot be considered a barrier to conducting an effective EIA process in the oil and gas industry. The participant went on to further explain that:

"I feel the idea of two silos EIA is an opportunity to ensure that the processes cover all the elements of the environmental concerns through a well-defined synergy...I think that is one of the benefits of the twin EIA system"—Participant (A)

Another participant from the Parliamentary Committee on Environment echoed a similar sentiment by stating that:

"I think having multiple agencies conducting EIA in the oil and gas sector is not the main problem....I believe the difficulty lies in their roles and mandate and capacity for implementation...there are reports on this issues and as a committee, we will look into these anomalies in order to be addressed"—Participant (G)

Moreover, at both regional and national levels in Nigeria, the question of which tier of authority holds the jurisdictional power to regulate the environmental impact of oil and gas development remains a significant source of conflict. Despite the decentralized governance structure involving federal, state, and local governments, environmental regulatory management in the energy sector continues to operate within a top-down bureaucratic framework. This approach is seen as constraining the ability of the sub-national government to influence environmental management decision-making related to oil and gas exploration and development in their communities within the Niger Delta region. As observed by some research participants:

"The EIA system in the oil and gas sector is of an excessive centralisation which prevents the low-level government from having significant input in the EIA -related process"—Participant (S)

"As far as I know, there's no reason why the State Ministry of Environment cannot be actively involved in conducting EIAs beyond merely serving as participatory stakeholders in the process... We are close to the oil and gas exploration and production sites because it is taking place in our backyard and negatively impacting the environment and livelihoods of the local inhabitants in the Niger Delta region. Unfortunately, this is not the case simply because the federal government doesn't want it to happen"—Participant (E)

"...I know the State governments are interested in regulating oil and gas EIAs... the participatory role given them is more or less symbolic because the state-level actors do not have significant input about the oil and gas EIAs outcome"—Participant (V)

For the state government participants interviewed, there was a clear emphasis on the need to ensure that the sub-national government, particularly the State Ministry of Environment conduct another circle of EIA-related processes in order to complement the federal government-led processes.

"...the federal government holds exclusive jurisdiction over oil and gas

licensing and operations, which means that only the Federal Ministry of the Environment and the Petroleum Resources Department are authorized to regulate the EIA process in the petroleum sector to regulate the EIA process in the petroleum sector... However, recently, there is growing agitation for the state government to have a more substantial role in the oil and gas EIA process, rather than merely serving as observers"—Participant (H)

Finally, the state government's push to establish their own version of oil and gas EIA regulations has been largely attributed to the perceived revenue benefits that currently accrue solely to the federal government. As pointed out by one Federal government participant:

"For far too long, the state government viewed the oil and gas EIA as a significant revenue source that benefits only the federal government.... So they are now advocating for a more substantial role in the EIA process, seeking to secure a share of the financial benefits accrual through the EIA regulatory processes in the petroleum industry"—Participant (B)

8.2.2 Perception of path-dependencies and lock-ins

Research participants spoke about how decisions about oil and gas development and management of the impact associated with the development have created path-dependent trajectories that lead to lock-ins in the EIA administration regime. It was found that the EIA institutional self-reinforcing mechanisms supplemented by political influence and interference of powerful actors have created and maintained a political and economic path that corresponds with their interests at the expense of environmental management practice. As pointed out by the following research participants:

"The EIA is a good decision support tool, but typical Nigerian political factors have distorted and perverted its value" —Participant (K)

"I can tell you decisions about oil and gas EIAs have been hijacked by a dominant pathway of political interference from the top powerful decision-makers, and this practice has induced attendant deleterious consequences

on the environment and livelihood of the local inhabitants in the Niger Delta region"—Participant (S)

"The EIA practice is politicized through a system of political patronage that essentially sees the EIA process as economic commodities that can be negotiated for, particularly through lobbying by the multi-national oil companies to get favourable approval from the individuals in the highest political offices in Nigeria"—Participant (Y)

When referencing the explicit consideration of the environment in decision-making, another research participant from the Nigerian Conservation Foundation appears to align with the above submission by admitting that:

"The weight given to environmental issues in the oil and gas planning and decision-making process is extremely low, let's say 10-15%, and even when regulators appear to suggest that environmental issues are given attention in the issuance of consent permits for oil and gas development, the political consideration over the environmental concerns usually determines the final decision" —Participant (I)

Furthermore, an interviewee from one of the competent authorities seemingly acknowledged the concerns raised by some participants by stating:

"Although there is this talk about environmental consideration or issues in licensing procedure or what the EIA requirements envision for hydrocarbon development...however, in most cases, environmental considerations are slightly out of weight because economic consideration is given considerable weight in issuing drilling permits and EIA approval due political pressure. I believe the Minister(s) are more interested in the opportunity that hydrocarbon development offers the government in terms of economic investment"—Participant (B)

Research participants also linked the negative aspect of politicising the EIA practice for oil and gas in the Niger Delta region to path-dependent and lock-ins. For instance, a

research participant from the environmental NGO—Mother Earth Foundation noted that “path-dependent trajectories that have been created and maintained by the powerful actors within and outside the EIA institutional regime led to lock-ins in environmental decision-making or even the actual implementation of oil and gas development”. This participant went on to buttress this claim by saying that:

"There are instances in which the ENGOs mobilised the local inhabitants against the EIA approval for certain proposed oil and gas projects deemed environmentally harmful to their area...and this action caused major disputes between the government and the local inhabitants. However, because of the insistence of the government to go ahead with such decisions and the sustained citizen's campaign and opposition, the oil and gas EIA process and, by extension, the hydrocarbon drilling and development remain to date in a deadlock situation where hardly any progress is made to change the lock-ins"—Participant (Q)

There were also some suggestions by some of the interviewees that lock-ins in the prevailing EIA regime mean that the EIA process is used to rationalise controversial oil and gas project development due to the disproportionate influence and powers of the developers in the petroleum industry. As pointed out by the following research participants:

"Event when there is lock-ins in the EIA-related process for oil and gas in the Niger Delta region, the oil companies will always have their ways due to their enormous power and influence..."—Participant (P)

"We have seen cases where the EIA is used to rationalised controversial oil and gas project development due to the lobbyist syndicate of the oil companies in the Niger Delta region"—Participant (R)

8.2.3 Public consultation and participation

Nigeria's oil and gas sector EIA regime provides provision for public consultation and participation. However, research participants cited numerous shortcomings regarding public consultation and engagement in the oil and gas EIA-related process. It was found

that the actors responsible for initiating public consultation and participation do not accord significant importance to involving the local population in the EIAs. For instance, a research participant from the Association for Environmental Impact Assessment of Nigeria asserts:

"Firstly, there is a common belief by the regulators that public participation tends to slow down the decisions regarding oil and gas project development and that the process is time-consuming. Secondly, the proponents are adamant about conducting public participation because they always raise concerns about the cost of satisfying unrealistic demands from the community members. So these key regime actors look at issues... and then conclude that the exercise is capital intensive and unnecessarily lengthens the timeline for project implementations"—Participant (K)

In affirmation, another participant from the Nigerian Coalition for Gas and Oil in the Niger Delta raised a similar concern regarding approval for the oil and project development without the involvement of the affected parties:

"The key stakeholders responsible for public consultation and meetings often see the EIA process as something that can be done without the participation of the local population... I have witnessed several cases of oil and gas projects development in the Niger Delta area where the developer's obtained approval without the EIA report going through public scrutiny"— Participant (S)

Upon further probing into the extent of public consultation and participation in oil and gas EIAs, research participants explicitly described how community members are often excluded from the EIA processes within the industry. The participants expressed concern over the timing of public participation, noting that it typically occurs only after the regulators have already approved the environmental impact statement. As a result, the general public in oil-producing areas is often unable to shape or influence either the process or the outcome of the oil and gas EIAs. The following quotes broadly summarise some participant's comments and views:

"... the inclusion of the locals in the EIA process is often a rare exercise in the real sense and even where the community members are intimated... or the meeting is held... this typically happens well after the environmental impact statements have already been approved. Looking at this situation means that the relevant local population within the oil-producing communities usually missed the opportunity to meaningfully shape or make any input into the oil and gas project decision-making process"—Participant (X)

"The proponents intentionally issued a short notice for public participation to the community and ENGOs... and it is difficult to attain such meeting.... and when you did manage to show-up...you hardly get to see the developers...and their agents will inform you that you came late and that the meeting was already concluded"— Participant (W)

"I can tell you that even in some cases where public participation is mentioned or attempted, it was just a mere symbolic rather than substantive exercise... this is because the exercise remains very irrelevant to the original motives of the project at stake or its implementation"— Participant (V)

In contrast, industry participants refuted the above claims by suggesting that public consultation and participation are conducted for projects subjected to EIA in the oil and gas sector.

"... We often consult the community members about the proposed oil and gas project development through public hearing"—Participant (N)

"I know of two projects located in the Bonny area where some ideas in terms of protection of farmlands and landscape features were suggested during the public consultation exercise and were incorporated in the formulation of mitigation strategies as well as implemented at the development stage"—Participant (O)

However, research participants from a government regulatory agency clarified that their statutory responsibility is to ensure that developers organize public hearings and comply with the agreements or commitments made during public participation.

"Our job is to ensure that the developers carry out public hearings for project development which are subjected to EIA in the petroleum sector... this involves ensuring g there is a strong media action plan about the benefits that the oil and gas development would bring to the communities... so this also contributes to minimizing any action against the development during the public meeting" —Participant (B)

"We use the report of a public hearing in order to enforce the proponents to meet the commitments agreed in the public consultations"— Participant (D)

Similarly, an interview with another government official revealed important insights regarding public consultation in oil and gas EIAs. The official noted a growing loss of confidence in the consultation process. According to the participant:

"To be frank, developers have expressed concerns to us that, in many instances, even when they send out invitation letters to community leaders for public participation to get their views on proposed project developments, the responses they receive often indicate a lack of trust or a loss of confidence in the process"—Participant (A)

In responding to the loss of community spirit in public consultation and participation, a participant who is also the local chief in one of the Niger Delta communities attributed it to a lack of transparency and a considerable lack of confidence in the public participation exercise. This view is encapsulated in the below comments:

"...the majority of the locals are powerless individuals and often perceive the public participation exercise as lacking in transparency... I think these factors may have contributed to lack of enthusiasm for public

participation and consultation in many oil communities in the Niger Delta region"—Participant (W)

When asked about the local population's indifference toward public consultation and participation in the Niger Delta region, a participant from the state government agency lamented that the opportunity to influence the oil and gas project development decisions becomes a mainly symbolic feature of the EIA system where the proponents regard it as mere tokenistic—often aided by the money-mindset syndrome. The participant stated that:

"Well, it is an open secret that the community chiefs and influential youth leaders are conniving with proponents [oil corporations] to collect monetary benefits behind the scenes, and in this way, the larger segments of the community are denied the opportunity to participate in public hearings to deliberation about the proposed oil and gas project development"—Participant (H)

Interestingly, the foregoing narratives provide a compelling insight into how oil corporations undermine the objectives of public consultation and participation. By financially incentivizing community leaders—who are often more educated and perceived by the broader local population as advocates capable of challenging ongoing environmental degradation—these corporations effectively neutralize potential opposition. This practice not only distorts the public consultation process but also erodes the trust and confidence of the local communities, further exacerbating the challenges of addressing environmental issues in the Niger Delta region.

A lack of access to EIA documents was another significant factor constraining public consultation and participation. It was found that even though the EIA statute requires the proponents to make the EIA report accessible for at least twenty-one days for the general public to provide feedback on the process, nonetheless, accessing the EIA documents has remained a considerable challenge for most locals in the Niger Delta region. A participant from the Nigerian Conservation Foundation expressed this challenge by saying:

"The EIA Act clearly stated that assessment report shall be displayed for 21 days for the public to offer their input, but the reality is that... people hardly see such drafts and the developers pretend as if we don't have this clause" —Participant (I)

A similar dissatisfaction related to the lack of online disclosure and dissemination of the EIA report emerged from an ENGO participant who aptly remarked that:

"... disclosure of EIA report detailing oil and gas project development has been abysmally poor... environmental impact statements are not provided online on the government platforms for the local population in the oil-producing areas to make their input"—Participant (R)

These submissions clearly indicate that the absence of publicly accessible EIA reports on a dedicated website significantly hinders opportunities for local communities to voice their concerns and opinions regarding oil and gas project developments. This lack of transparency limits avenues to mainstream competing priorities and interests into environmental management practices. Therefore, when detailed EIA report information is not made available to relevant stakeholders, achieving the primary objectives of public consultation and participation becomes challenging, which are essential for critically reviewing, validating, and improving environmental decisions and practices.

However, while commenting on the public consultation and participation theme, a government official from the state ministry of environment added another layer of perspectives by stating that illiteracy and lack of awareness of the public involvement process by the locals' inhabitants often render information dissemination on online platforms a meaningless exercise: The quote below represents the participant views:

"I don't think the publication of the EIA report digitally will make much difference in terms of local input or contribution because the vast majority of the locals are not well-informed about how to make meaningful contributions relating to oil and gas project development in the Niger Delta region through online mechanism" —Participant (H)

Similarly, one research participant from Mother Earth Foundation took a different stand on the issue by claiming that:

"... the guidelines for conducting public participation of oil and gas EIAs is vague with several anomalies...the current law is based on discretionary and not mandatory requirement"—Participant (Q)

Quite the opposite—another participant echoed a slightly different opinion other than the ambiguity of guidelines by suggesting that a politically influenced EIA exercise could be the reason for the reduced willingness of the local inhabitants to participate in what they perceived as quasi-stakeholder consultation. The following quote conveys the participant's view:

"...public consultation and participation in the oil and gas sector have been politicized...it is more like a public relation exercise because oil companies sponsor some elements within the community to defend projects that were already approved without public participation"—Participant (J)

Finally, interview insights revealed that unfavourable geographical conditions and security concerns significantly hinder oil firms' ability to ensure effective consultation and participation in the Niger Delta region. Many areas face challenges related to accessibility and lack of reliable internet service. Consequently, developers often need security escorts to reach these remote locations, which increases costs and time while creating an environment that is not conducive to meaningful public engagement. For instance, an industry participant claimed that:

"... you know the Niger Delta region is a very volatile as well as the hostile place...In many cases, even if we want to hold a public hearing, it is difficult to guarantee the safety of our personnel in some remote places"—Participant (O)

It is evident from the last extract and preceding insights that several interrelated challenges significantly undermine adequate and meaningful public consultation and participation in the environmental impact review of oil and gas project development. In other words, these issues undermine the overall co-management of environmental

management and protection in the prevailing EIA regime in the Niger Delta region.

8.2.4 Limitations to EIA practice in the oil and gas industry

Participants identified several limitations to the current EIA approach in the oil and gas sector. The most frequently noted limitations of the prevailing project-based EIA practice in the Niger Delta region include reactivity, short-termism and narrowly focused mandate on individual project development and implemented too late in decision-making to be an effective regulatory instrument to address a complex web of cumulative effects, uncertainties and broader policy issues associated with the oil and gas development. The testimonials concerning the constraints of project-level EIA ensued:

"Although EIA is a good instrument for improving project design, but it cannot effectively inform the preparation of a long-term oil and gas development strategy"—Participant (Q)

"The EIA instrument is overly reactive than integrated and proactive"—Participant (K)

The EIA is not considered at the early stages of decision-making"—Participant (D)

"The EIA is implemented very late in the planning and decision-making process in the oil and gas industry"—Participant (P)

"EIA often had little or no impact during the early phase of the policy-planning and regulatory process"—Participant (R)

"If you look at the trend of EIA application, it has rarely been able to influence the key decision-making process and, in many instances, it has been considered after decisions about a project development have been concluded or even after the project is at the development stage"—Participant (V)

Expanding on the above wavelength of thought, some participants argued that hydrocarbon drilling and extraction are transboundary in nature and that the EIA does not effectively deal with cumulative and synergistic impacts in the environmental

analysis. The following comments convey the participant's insights on this limitation of the EIA.

"The EIA has a narrow focus and mandate... and often does not account for the long-term cumulative environmental impact of hydrocarbon exploration and development, which are by their nature pose threats to wide geographical footprint"—Participant (T)

"Not at all..., the current EIA regulatory approach in the Niger Delta region remain firmly focused on environmental implications of individual project in isolation of other induced development such as third-level consequences or even secondary indirect effects on the ecosystem"—Participant (W)

"Based on my experience, there has been little evidence to show the environmental effects that may result when multiple individual projects of the same type are sited in the oil-producing communities in the Niger Delta area. This is because, whether by commission or omission, nobody talks about the long-term cumulative and regional issues of hydrocarbon projects that operate in a large network of infrastructure to understand their impact on the composition of the ecosystem...perhaps due to EIA's focus on immediate and direct consequences"—Participant (K)

Another common limitation of the prevailing EIA regulatory approach in the oil and gas sector was related to the EIA's lack of capacity to inform or influence key final decisions regarding a proposed oil and gas project development in the Niger Delta region. Although some participants appear ambivalent, the less favourable characterisation of the current EIA regulatory regime stood out from their comments. The excerpts below succinctly crystallise participants' insights, arguments and observations:

"Even when EIA works at its best in terms of project approval consent and in some cases affecting minor changes to proposed project design, it does not shape or influence decisions of alternatives or site selections for a large network of project infrastructure such as flow stations, depots or pipelines route in the Niger Delta region"—Participant (P)

"We have issues with the oil and gas pipelines routing... In many cases, pipeline construction traverses residential areas and farmlands in the Niger Delta region... I do not think there's such thing as thought-out alternatives [options] in the environmental review process"—Participant (Y)

"...suppose the EIA for oil and gas in the Niger Delta prioritise the project location like siting of oil storage [tank farm] and pipelines installation and even the nature and type of technologies that are used... In that case, we can boast of an alternative consideration... I can tell you that looking at the EIS prepared by the developers, the reports most broadly does not account for alternatives to project design or implementation"—Participant (R)

"It is difficult to claim the element of alternative consideration under the current EIA practice. There was a project [Liquefied Petroleum Gas] in which the issue of alternatives was raised, and this happened because of the involvement of the external consultant... the alternatives to toxic emission and noise to the surrounding area where the project was being considered were raised, but unfortunately, the lead proponent with the support of the regulatory actors downplayed this aspect and the developer got away with it... this is one of the frustrating aspects of the EIA practice in this lucrative [oil and gas] sector."—Participant (K)

Closely related to the above, another key limitation identified under the current environmental management regime in the oil and gas industry was the lack of a strategic thinking approach (SEA). Currently, where strategic issues have emerged in project-level assessment, the EIA has rarely been able to address them adequately. Most participants, particularly from the multi-lateral development organisations, environmental experts and ENGO identified this limitation as one of the main challenges to the current environmental assessment process and management in the oil and gas sector. Some of these participants' testaments are documented below:

"There is no doubt that the EIA instrument is good at informing the

environmental consequences of project development, but it cannot address strategic issues in the decision-making process"—Participant (K)

"EIA process can't fit within the strategic framework because it was not designed with that purpose in mind"—Participant (T)

"Currently, EIA regulatory practice cannot enable well-thought-out decision processes and long-term policy designs to address the regional impact of hydrocarbon development due to its lack of strategic perspective—Participant (U)

It is evident from these insights that the absence of a strategic approach in the current oil and gas planning, regulation and development mean that decision-makers cannot effectively address broader concerns related to the cumulative and regional consequences, disparate objectives, underlying policy conflicts and long-term options within the oil and gas sector. As a result, these issues will likely continue to impede decision-making processes in the oil and gas sector, making it difficult to achieve sustainable and integrated environmental management.

Finally, as attention turns to opening new frontiers to potential hydrocarbon drilling and exploration in Nigeria, some participants advocated the need for more coordinated approaches to oil and gas planning, regulation and development in Nigeria to foster better, more strategic and long-term policy decisions that centred on sustainability. The participants argued that:

"There is no requirement for a strategic approach in the current environmental planning and management practice in the Niger Delta region oil and gas sector. Therefore, I think there is a need to have an SEA mechanism to allow early consideration of the environmental effects of policies, plans and programmes before the EIA is applied at the level of project assessment"—Participant (T)

"For more than 30 years, decisions about oil and gas development and

management of the effects associated with the energy development in the Niger Delta region have been based on the project-level EIA ...looking at the growing attention to open new frontiers to potential hydrocarbon exploration and development, I think there this the need for a more strategic approach to help design policies, plans and programmes to achieve sustainable oil and gas development transition"—Participant (U)

It is interesting to note that emerging out of the limitations of the prevailing project-based EIA approach to oil and gas planning and impact assessment in the Niger Delta region, which is characterized by reactiveness, short-termism and narrowly focused mandate, participants advance the need for a more strategic regulatory regime to help design and guide policies, plans and programmes decisions on opening the new frontier to potential hydrocarbon exploration and development in Nigeria. Their assertion seems to suggest that considering the potential regional and long-term cumulative impacts of energy development in the new frontier basins, continual reliance on a project-centric EIA regulatory approach with the possible outcome of a business-as-usual scenario, i.e. assessing mainly project impacts akin to the current practice in the Niger Delta region, may likely imperil the prospect of achieving sustainable oil and gas development in the new frontier. Therefore, mainstreaming a more strategic thinking approach can allow for sustainability objectives and broad alternatives to be mainstreamed into the policy-planning and decision-making process for the new frontier basin and, in doing so, streamlined focus-attention on identifying and assessing cumulative and regional environmental impacts of potential oil and gas development, alternative development futures for a new region rather than just predicting and mitigating the impacts of individual projects.

8.3 Awareness of SEA

Participants were asked to indicate their general awareness of SEA (see Table 8.1). The overall responses show a considerable variation in SEA awareness among the interviewees. For instance, 44 per cent (n=11) of the participants said they were familiar with SEA, while 24 per cent (n=6) had a basic awareness—having heard or read about the SEA concept. Additionally, 12 per cent (n=3) were neutral, and 20 per cent (n=5) had

no prior knowledge of SEA. From the analysis of the findings, it can be seen that most of the research participants stated that they were familiar with SEA. This is unsurprising given that some participants were drawn from relevant government agencies responsible for environmental practice in the oil and gas sector, international development organisations and experts from the impact assessment community. However, some research participants had only heard or read about the SEA rather than having a nuanced understanding of the SEA concept. Further insights into this theme are succinctly expounded below.

Table 8.1: Frequency and percentage of participants' responses to SEA awareness

Participants/affiliation	Yes	No	Neutral	I only heard/read the term SEA
Federal government regulators	2 (18.2)	3 (50.0)	2 (66.7)	2 (40.0)
State government	-	1 (16.7)	-	1 (20.0)
Local chiefs	-	2 (33.3)	-	-
Industry	-	-	1 (33.3)	1 (20.0)
ENGOS	5 (45.4)	-	-	1 (20.0)
Environmental experts/academic	2 (18.2)	-	-	-
MDAs	2 (18.2)	-	-	-
Total	11 (100)	6 (100)	3 (100)	5 (100.0)

n=25

Regarding the research participants who only heard of the term SEA, the following assertions support their claims.

"I first heard of the SEA through a seminar hosted by Environmental NGOs in collaboration with the Federal Ministry of Petroleum Resources, but I am not familiar with the nitty gritty or how SEA operates"—Participant (A)

"...you know SEA is not mandatory in preparing a national development strategy in Nigeria. I only read about SEA"—Participant (F)

In contrast to the above views, some research participants expressed an awareness of

SEA by stating:

"I have worked at the Ministry of the Environment for a considerable amount of time and have a high level of involvement in policy dialogue with the multilateral and bilateral development agencies...I have some awareness about SEA concept"—Participant (D)

"My interest in sustainability greatly impacts how I understand what SEA stands for... I know a little bit about SEA, but it may not be very practically in-depth per se"—Participant (L)

In alignment with the above statements, an oil and gas industry participant also acknowledged possessing the basic knowledge or information about the strategic EA concept by saying:

"Of course, I am familiar with Strategic Environmental Assessment"—Participant (N)

Apart from the participants who only heard or read about SEA and those with abstract knowledge of SEA, other research participants appear to know much about SEA. For example, this was reflected in statements mainly made by the following participants:

"As a member of the Association for Environmental Impact Assessment of Nigeria, I know what SEA is... though we don't have its provisions in Nigeria"—participant (K)

"I believe I am familiar with the term and to some extent the concept itself"—Participant (P)

"...I can tell you from my experience that I know SEA because it deals with the assessment of the environmental effects of strategic initiatives or policies, plans and programmes...."—Participant (U)

"My capacity to consult and advise the governments in coordinating

different response strategies to environmental risk issues in several jurisdictions allowed me to know about SEA... So I think I am familiar with SEA."—Participant (T)

On the contrary, one participant from the Nigerian Petroleum Development Corporation did not differentiate between the EIA and the SEA and thus perceived both the EA procedures to be the same.

"Frankly speaking, whenever I heard about SEA, I often assume that it is the same thing with the EIA [EA procedure] that is foremost in the oil and gas industry"—Participant (C)

Interestingly, though not surprising, there appears to be an exception among the interviewees regarding SEA awareness. For instance, a representative from a state government agency acknowledged a complete lack of SEA knowledge by noting that:

"I am not aware of SEA... this is my first-time hearing of this concept... I only know the current EIA that is applied in the oil and gas industry"—Participant (H)

Overall, the participant's responses revealed a significant disparity in the awareness of SEA across different groups. Notably, participants from sub-national government agencies appeared less familiar with SEA compared to their counterparts from federal agencies, representatives of multilateral development institutions, environmental NGOs and environmental experts. The limited awareness of SEA among some government officials can be attributable to the absence of SEA provisions in Nigeria's regulatory framework. Conversely, the high degree of SEA awareness, particularly among environmental experts, representatives of multilateral development institutions and NGOs can be linked to their commitment to the principles of sustainable development. These principles, often emphasized in both the rhetoric (i.e. academic or advocacy) and practical experiences of international development organisations, have fostered a deeper understanding of and application of SEA in their professional and career endeavours.

8.4 Acceptance of SEA

When participants were asked for their acceptance regarding the transition in environmental management practice from a project-based EIA to SEA approach in Nigeria's oil and gas sector, there was overwhelming support for the shift. Two-thirds of the research participants, accounting for 60 per cent, expressed their support for the transition in environmental management practice toward a strategic regulatory regime, while 27 per cent voiced objections and 13 per cent maintained a neutral stance (See Table 8.2).

Table 8.2: Frequency and percentage of participants' responses to SEA acceptance

Participants/affiliation	Yes	No	Neutral
Federal government regulators	3 (23.1)	5 (71.4)	1 (20.0)
State government	-	1 (14.3)	1 (20.0)
Local chiefs	1 (7.7)	-	1 (20.0)
Industry	-	1 (14.3)	1 (20.0)
ENGOS	5 (38.5)	-	1 (20.0)
Environmental experts/academic	2 (15.4)	-	-
MDAs	2 (15.3)	-	-
Total	13 (100)	7 (100)	5 (100)

n=25

Some research participants that support the introduction of an SEA regulatory regime in the petroleum industry were of the view that:

"Following more than three decades since the introduction of the current EIA system in the petroleum sector, I will support the adoption of the SEA in Nigeria"—Participant (R)

"I believe the transition to SEA process can be beneficial to the oil and gas industry, and therefore, I will support its introduction as a decision-support tool to help plan for oil and gas exploration and development in Nigeria"—Participant (P)

"of course, I'm in support of introducing an SEA in Nigeria's oil and gas policy-planning and development"—Participant (D)

"In my view, the integration of SEA to support the current EIA system in planning for oil and gas development in Nigeria is long overdue. I am categorically in support of such EA approach."—Participant (Q)

"I think we have reached the point that introducing an environmental assessment procedure other than the existing EIA is a welcome development.... The oil and gas industry needs such decision-support instrument"—Participant (U)

However, when asked to highlight what they consider as the fundamental added-value of a shift from managing individual projects to more strategic EA in environmental management within the oil and gas sector, some participants suggested that SEA would enable the integration of environmental considerations at the earliest stages of decision-making, thereby enhancing environmental planning and impact assessment. Participants' views on the potential benefits of a shift toward the SEA process are described below:

"SEA could help improve environmental planning and impact assessment processes in the oil and gas industry" —Participant (V)

"SEA would ensure the environmental issues associated oil and gas development are considered very early in the planning process before decisions can be finalised at the strategic tier of policies, plans and programmes"—Participant (U)

"SEA can allow regulatory authorities to address strategic issues at a higher level of decision-making before the projects are designed "—Participant (P)

In contrast to the prevailing support for integrating SEA in the petroleum sector, some participants, notably from government agencies and industry players—have raised apprehensions. Their concerns revolved around the potential addition of an extra layer of administrative tasks and bureaucracy in the environmental screening and review. A

government representative stated that:

"the current EIA administration is overwhelmed with the client's requirements...I do not think there is the need to introduce another process [SEA] that would exacerbate the already burdensome administrative demands on the government regulatory department."—
Participant (C)

"All the fancy talk about SEA for now are just speculative...I am not in support of this regulatory process"—Participant (A)

In affirmation of the above opinions, an oil and gas industry representative echoed similar concerns by saying:

"I am not in support of adding SEA in the regulatory process of oil and gas planning and development in Nigeria, and this is because the developers currently struggle to meet the requirements of multiple permitting processes from two agencies...I think adding an SEA will inevitably add another extra layer of bureaucracy and delays to the approval process"—
Participant (O)

8.5 Landscape influence(s)

This section presents the potential factors that could help enable the transition from a project-level to a strategic-level approach in the environmental management regime within Nigeria's petroleum sector. Most frequently noted factors or motives include the increasing demands for SEA implementation as a pre-condition for funding oil and gas development by the international multilateral and bilateral lending agencies, sustainability and climate change concerns and learning opportunities from the prevailing EIA practice in the Niger Delta region. Participants' perspectives on these potential motives or critical decision factors for strategic transition are elaborated below.

8.5.1 Influence of Multilateral Development Agencies

Participants identified the growing demand from multilateral development agencies as one of the key potential drivers that can propel the uptake of an SEA in the oil and gas

policy sector. For instance, two of the research participants assert that:

"There has been an increasing demand for SEA implementation as a precondition for financing oil and gas development by some multilateral development agencies as part of safeguarding approaches to mitigate the impacts hydrocarbon drilling activities....Although this demand [discussion] is at the preliminary stage, nevertheless, I believe it is a matter of time before Nigeria will embrace SEA regulatory"—Participant (Q)

"Like they have done in the past with the EIA, there's now an emerging interest from the international development organisations to make SEA as part of their lending condition for financing oil and gas development... I think this type of conditionality could help drive SEA adoption in Nigeria"—Participant (K)

Exploring the degree of influence the multilateral development agencies in promoting SEA in Nigeria, a participant from one of the MDAs went on to clarify that:

"...I think you should know this...we don't impose SEA requirement on any country or corporate governance...but on a case-by-case basis, the World Bank prioritises integrated and proactive evaluation of the environmental effects of policies, plans and projects as an essential precondition for meeting the financial aid or loan to execute strategic national or sector development initiatives, including in the energy sector....So If this is what you mean by driver... then it could be one of them"—Participant (T)

Similarly, a UNEP participant stressed that development organisations might likely be a driver for implementing a strategic approach to environmental planning and impact assessment in Nigeria's oil and gas sector. This is evident in the quote below:

"I believe the actions of development organisations may help Nigeria adopt SEA...for example, if you look at the Paris Declaration on Aid Effectiveness held in 2005, the donor community [multilateral and

bilateral] was urged to focus on supporting the government in developing countries to establish SEA at the national and sectoral levels"—Participant (U)

Likewise, an environmental expert further explained why the increasing demands for SEA implementation as a pre-condition for funding oil and gas development by some international development and or donor agencies could be one of the potential drivers for a strategic transition in the environmental management regime within Nigeria's petroleum sector. The participant went on to say that:

"The repeated appeal to the regulatory authorities to implement a more integrated assessment approach other than the current environmental management practice under the EIA regime in the petroleum sector fell on deaf ears for a long time now... but I think the growing pressure from some of the multilateral and bilateral lending organisations to implement SEA as a pre-condition for financing like oil and gas development, the government may bow to this pressure eventually"—Participant (R)

In an effort to understand how the shift toward a strategic regulatory regime in the petroleum sector could occur due to the growing demands for SEA implementation as a pre-condition for funding oil and gas development in Nigeria, some interviewees pointed to the looming threat of divestment by multilateral financial agencies. For instance, some participants argued that:

"When the government no longer gets the needed investments to finance oil and gas development, particularly in the new emerging frontier basin region, they will succumb to the pressure to adopt and operationalised SEA process"—Participant (K)

"Changes in micro-economic or market dynamics, such as the increasing importance of environmental criteria for investors, can compel incumbent environmental management regime in the oil and gas sector to adopt SEA to attract and retain investment"—Participant (V)

Notwithstanding the perceived potential drivers that can help drive the transition toward a strategic level approach to planning and impact assessment in the oil and gas sector, there were concerns, however, that the incumbent actors within the EIA regime and industry players will likely resist the SEA approach in the petroleum industry. As one participant pointed out:

"I think a transition to a more strategic planning and impact assessment process will likely encounter resistance because environmental management culture and practice in the petroleum industry are deeply entrenched within the existing EIA regime. In my view, as far as a shift to SEA is concerned, incumbent actors within the current EIA regime and the oil companies will likely prefer to maintain the status quo of the existing regulatory process"—Participant (P)

8.5.2 Sustainability consideration

Research participants also identified sustainability consideration as a potential motive for a strategic transition in Nigeria's oil and gas planning, regulation, and development. The interviewees seem to suggest that sustainability has significantly emerged as a central issue in the international development agenda, moving from a subject of concern limited to regional or country context to an issue debated in global arenas, particularly in the search for more sustainable forms of environmental policy instrument or in the expectation of improved environmental performance in the oil and gas industry. The detailed statements supporting the notion that the growing emphasis on sustainability considerations could be a well-founded rationale for facilitating a strategic transition toward an SEA regulatory approach — that is better suited to plan for sustainable hydrocarbon exploration and development in Nigeria are presented in Table 8.3 below.

Table 8.3: Sustainability concern as a driver for a transition toward SEA

Participants	Quotations/comments
Participant Q	<i>"I think we all have seen how unsustainable hydrocarbon development can severely impact the ecologically sensitive marine environment in the Niger Delta region.... therefore, I believe the growing need to respond to sustainability pressure in the oil and gas industry will likely reinforce the momentum for SEA uptake..."</i>
Participant K	<i>"Globally, sustainability issues are defining a new agenda for the oil and gas sector... for Nigeria, I think there is a need for a strategic EA that allows for higher level environmental protection and sustainability objectives in the decision-making process before project development decisions are made"</i>
Participant L	<i>"It is obvious that we can't achieve sustainability objective in the hydrocarbon development in Nigeria by looking at the individual impact of project development through the prism of the EIA process...to deepen sustainability goal, I feel there is the need for a more integrated planning and assessment such as SEA in the petroleum sector"</i>
Participants V	<i>"Sustainability requires a holistic approach to environmental management that goes beyond the scope of mitigating the potential impacts of individual energy development projects. It demands consideration of long-term environmental effects. As a higher-order environmental assessment, I think SEA could help operationalise sustainability principles in the oil and gas policy and planning initiatives"</i>
Participant T	<i>"In my view, since the oil and gas industry is often perceived as being in tension with the goal of sustainable development agenda, the sustainability consideration will likely propel the idea of SEA regulatory approach in the oil and gas industry as a way of demonstrating to the stakeholders that the government is adopting a more environmentally-friendly policy"</i>

8.5.3 Climate change concern

Closely related to the above landscape factor, participants referred to climate change concerns as one of the potential drivers that can accelerate the adoption of the SEA regulatory approach in Nigeria's oil and gas industry. For instance, a climate change advisor to the federal government of Nigeria stated that:

"As a signatory to the United Nations Framework Convention on Climate change (UNFCCC) and Kyoto Protocol, Nigeria is under pressure to implement environmentally-friendly policies for development-related activities with the oil and gas industry is seen as a promising path to demonstrate such commitments which SEA as an integrated assessment procedure could be one of the options to consider in the future"—
Participant (M)

In addition to the above submission, another research participant from the Friends of the Earth Nigeria further stated that:

"If you have been to the Niger Delta, you would have seen the practical reality of climate change in the area ... although it is difficult to attribute such scourge of impacts solely to the oil and gas exploration development, but it is intimately linked to it. Therefore, in my view, it is difficult to assess and predict uncertainty, magnitude, timing and complexities related to the climate change impacts by relying on the EIA due to its narrow scope in the decision-making process....So I think this limitation of the current approach may lead to the adoption of SEA approach to address climate change issues related to oil and gas development at the level policy, plan and programme in Nigeria"—
Participant (Q)

Another participant, however, suggested that the current EIA approach could not address climate change within the petroleum industry. The participant went on to state that:

"The climate change impacts related to the greenhouse gas emissions that may result from interrelated oil and gas exploration, production and

operations, including the construction of pipelines or other related infrastructure, will require a strategic approach to plan for effective mitigation and adaptation strategies. This is by all standards a far cry from what is considered under the current EIA approach in Nigeria. I am saying this because it is obvious that Nigeria will not abandon its rich energy resources in the foreseeable future, and with the limitations of the current EIA practice to deal with complexities of environmental challenges like climate change, I think a transition toward SEA regulatory mechanism could help fill this gap"—Participant (U)

It is evident from the interview findings that the climate change issue could be one of the main potential drivers toward a strategic transition in the environmental management regime in Nigeria's oil and gas industry. This perspective is noteworthy, as it highlights the potential influence of exogenous factors, such as global climate commitments could have a significant impact on the diffusion of the existing environmental management practice toward a more strategic environmental process in the petroleum sector. From a broader perspective, climate change has been one of the major catalysts for pushing the diversification of the energy mix away from hydrocarbons, primarily driven by developed nations in the Global North — though in the absence of international consensus and obligations. However, in the context of developing countries like Nigeria, which often view the move away from fossil fuels as a threat to their economic interests and revenue sources, a shift from managing individual projects to more strategic EA appears as a more viable option. This is partly because SEA is perceived as a promising decision-support instrument that could help enhance environmental management decision-making in the oil and gas sector, particularly given the centrality to the now consensually overwhelming need to address the pressing need for carbon reduction and to tackle long-standing environmental issues such as air quality and landscape issues associated with hydrocarbon drilling and development.

8.5.4 Learning opportunities from the prevailing EIA practice

The learning process involves knowledge about how the current state of EIA practice in

the Niger Delta region can play a crucial role in driving a transition toward a more strategic thinking approach in Nigeria's oil and gas policy sector. Participants acknowledged that the EIA practice has evolved, and that practical experience has been developed in the old frontier, which could offer significant learning opportunities toward a strategic transition in oil and gas planning, regulation and development, particularly in new frontier basin areas. The participants' perspectives on this theme are reported below:

"Some stakeholders are beginning to reflect and question the effectiveness of environmental management in the oil and gas sector over the past decade, based on their experiences with EIA processes. I think this reflection provides a valuable opportunity for ongoing learning in environmental assessment that will potentially promote the strategic transition in Nigeria"—Participant (V)

"I think the government regulators, developers and relevant stakeholders can learn from the past EIA practices in the Niger Delta region and understand the contribution made by EIA in working towards better environmental decision-making and where it has also failed. These reflective insights will likely help in the search for a more strategic assessment process that can fill in the gap or deficiencies in the EIA"—Participant (P)

Interestingly, in support of these excerpts, an environmental expert offered the following perspective:

"Based on evaluation and synthesis of the current EIA practice in the Niger Delta region, there has been a gradual understanding that EIA does not allow for sustainability objectives to be addressed or considered effectively due in large part to the narrow scope and the reactive nature of project-level assessments and decisions. So, this knowledge could help question whether there are merits in pursuing oil and gas development based on a project-level approach, particularly in the new frontier basin...In my view, this awareness can be one of the key factors that will enable the integration of SEA, which could help provide the desired sustainability pathways in the

new frontier basin, establishing the context by which individual project EIAs could be used to make decisions about how an ecological baseline condition may change within a limited spatial scale in response to oil and gas project development”—Participant (K)

The participants highlighted that leveraging existing knowledge, particularly the practical experiences gained from EIA practices in the Niger Delta region, could significantly advance the SEA approach to oil and gas development assessment and decision-making. By sharing these outcomes through active engagement among relevant stakeholders, this collective learning through EIA experience may be a critical driver for integrating SEA into oil and gas development assessment and decision-making to foster more sustainable outcomes.

8.6 Niche innovation

The final analytical focus of the interview data was centred on understanding the potential conditions under which SEA innovation could be developed in Nigeria. This involves exploring views of internal niche dynamics such as actors' expectations, policy window, network building and learning processes, which collectively will shape the maturity of the niche toward opening up to SEA innovation in the oil and gas policy sector.

8.6.1 Expectations on SEA development

The research participants expressed a range of views regarding the expectations for SEA development in Nigeria. The data revealed a noticeable trend of positive expectations largely driven by the perceived potential benefits of the SEA process. The positive expectations among the participants were rooted in the pressing need for an enhanced environmental assessment process in the oil and gas sector. The need for improved environmental management decision-making is especially pertinent given the increasing interest in exploring the new energy frontier regions for potential hydrocarbon exploration and development. The opinions of the interviewees regarding the prospect of SEA innovation in the oil and gas policy sector are presented below.

"I am confident of the prospects of SEA development in Nigeria, particularly

in the oil and gas industry”—Participant (K)

"There is no system of SEA for oil and gas planning, exploration and development in Nigeria... So I think there is a justifiable ground for SEA innovation to be nurtured, developed and integrated into the petroleum sector”—Participant (Q)

“There is going to come a point that concept of SEA, in whatever shape and form, would finally be developed and incorporated into oil and gas environmental planning and assessment to complement the existing EIA regulatory process in the oil and gas sector”—Participant (V)

"I am not at all happy about how EIA works at the moment in terms of providing an appropriate management response to the environmental challenges caused by oil and gas drilling activities, particularly in the Niger Delta region... So I believe there is potential for an improved environmental assessment process through the SEA regime in Nigeria, especially now that the government is opening up the new frontier to potential hydrocarbon development”—Participant (A)

Despite the optimism expressed above, other participants highlighted a significant concern regarding the prevailing dominance of the current EIA regulatory regime in the oil and gas sector, which could potentially overshadow and stifle the prospects for SEA innovation. The participant went further to explain that:

“There is the long-standing EIA mindset and practice in the oil and gas sector, which is likely to hinder the potential for SEA development”—Participant (R)

“I am sceptical about the prospects of SEA innovation in the oil and gas sector because the regulators and developers seem intent on maintaining the status quo of project-specific environmental assessments. I sense their reluctance and unwillingness to embrace long-term strategic planning for oil and gas development in Nigeria may hinder the potential for SEA development”—Participant (P)

Given the overall perspectives expressed by the participants, the data suggest a positive expectation regarding the potential of SEA innovation in Nigeria. The positive expectations stem from the recognition of the absence of the SEA framework in oil and gas planning, exploration and development, along with the awareness among participants that the existing EIA processes are insufficient to address the complex and long-term environmental impacts associated with oil and gas exploration, production and operations. The traditional EIA approach focusses primarily on mitigating the impacts of individual development projects and often fails to account for the cumulative and regional environmental implications of oil and gas development in the Niger Delta region. Consequently, there is a growing expectation for SEA development to help inform oil and gas development strategies and environmental management framework for Nigeria's new energy resources regions.

8.6.2 Window of opportunity

It is apparent from the interview result of this study that the PIA—which outlines an ambitious plan to expand oil and gas development into the new frontier was seen as a critical window of opportunity under which the SEA innovation could be developed in Nigeria. Research participants expressed strong optimism, acknowledging that although SEA is currently in its conceptual and pre-development stages, the PIA provides a conducive policy environment for promoting SEA in the oil and gas industry. As pointed out by one participant:

"The policy window provided by the PIA will increase the likelihood of SEA development in the oil and gas policy sector"—Participant (U)

In the same context, another research participant appears to align with the above statement by saying that:

"Yes, of course, policy agenda such as the PIA, which proposes a plan to expand oil and gas development into new frontier basin fields, along with the need to improve environmental management practice, provides a fertile ground within which the fragmented ideas of SEA could be developed in Nigeria"—Participant (P)

Another insight that emerged during the interview was the importance of capitalising upon this unique window of opportunity to nurture and reinforce the need for the SEA process in environmental planning and management practice within the oil sector before it becomes foreclosed. There appears to be a palpable sense of urgency among stakeholders, driven by the belief that if niche and regime actors fail to take advantage of this pivotal moment, the opportunity for meaningful progress toward SEA innovation in Nigeria's oil and gas sector may disappear. The following quotes captured the perspectives of the participants on this theme:

"Different times can have different impacts on policy agenda... I think the PIA offers a right moment to frame SEA ideas in line with the interest of the government to expand oil and gas development into the new frontier before the policy window closed"—Participant (T)

"With the PIA on the table, I think there wouldn't be a better timing than now to introduce the application of environmental assessment of higher-level strategies in the petroleum industry"—Participant (Q)

"It is particularly important that the policy window provided by the PIA is used to shape SEA development in socially acceptable ways in the oil and gas environmental regime"—Participant (V)

"The window of opportunity might not be open for long, and it will close in a couple of years once the new energy frontier is matured through the use of the EIA regulatory regime... I feel there is a need to take advantage of this emergent policy window (PIA) to improve environmental management practice by incorporating a new regulatory process (SEA) to plan for oil and gas development in the new frontier basin"—Participant (R)

The narratives above highlight the inevitability of the policy window becoming foreclosed if the relevant actors fail to capitalise on it to initiate as well as mainstream strategic thinking approach to the oil and gas policy sector. These views underscore the imperative

to leverage the "Decision Window" provided by PIA to nurture, promote and progressively integrate the SEA innovation into the environmental management practices in the oil and gas sector. However, a number of interviewees warned that despite the policy window offering an opportunity to initiate SEA innovation, the most critical factor is the political will to create and sustain a protected space that nurtures and safeguards such innovation. Without this commitment, the potential for SEA development may not be fully realised.

8.6.3 Interaction among niche actors

This section explores the formation, relationships and interactions among niche actors engaged in promoting the SEA regulatory process within Nigeria's oil and gas policy sector. Interview results reveal the emergence of network formation among these actors, highlighting a growing niche innovation for SEA. The interactions and collaborations seem to occur on the fringe of the prevailing oil and gas EIA regime. The following quotes provide further insight into this theme:

"There has been evidence of interaction among the key stakeholders that advocate for sustainable environmental management and protection in Nigeria's oil and gas industry...and you know, the idea of SEA regulatory process to support the current EIA practice come up in our discussion"—
Participant (U)

"Specifically, I have had discussions with some environmentalists within and outside of the oil-producing areas for the potential environmental assessment of the oil and gas PPP development initiatives in Nigeria"—
Participant (T)

These participants' assertions indicate that some degree of interaction has occurred among the niche actors. These insights have significant merit because coalition-building and networking among niche actors are essential for driving the momentum needed to transition from unsustainable to sustainable environmental management practices within the oil and gas sector. For SEA innovation to advance at the niche level, it is crucial for niche actors to establish robust networking and interaction. Such interaction would

help facilitate informed debates and consensus-building among the actors to ensure that the SEA innovation becomes accepted or embedded into the mainstream environmental management framework in Nigeria's oil and gas industry.

8.6.4 Collaboration between niche and regime actors

The collaboration or relationship between the niche and incumbent EIA regime actors in terms of working together to enable the maturity of the niche toward opening up to SEA innovation in Nigeria can exist in two different forms: collaboration or competition. The research participants highlighted both of these potential issues. The following quotes demonstrate a spectrum of views between various stakeholders and begin with the incumbent EIA regime actors.

"From time to time, we do have interaction with some major organisations regarding the use of SEA in Nigeria, particularly in the petroleum sector to safeguard environmental quality"—Participant (D)

There are ongoing discussions between the government and some multilateral development agencies on the benefits of the assessment of the likely environmental consequences of oil and gas policies, plans and programmes development than solely those caused by a particular project"—Participant (B)

However, other regime actors expressed a certain level of scepticism about the motivation for or the benefits of collaboration with the niche actors. Their comments are reported below:

"The SEA regulatory process could become another layer of bureaucracy in the oil and gas industry with potentially no real benefits"—Participant (C)

"In trying to promote the use of SEA, the MDAs and ENGOs tend to exaggerate or promote imaginary environmental issues, and it can be viewed, by some developers as a way of giving a kind of whitewash campaign to hydrocarbon development that is central to the

development of Nigeria's economy"—Participant (N)

In contrast to the claims above, the niche players highlighted instances where the regime actors appear to compete with their campaign in search of more sustainable forms of oil and gas development or the need for improved environmental performance by industrial operators, potentially jeopardizing the prospects for SEA innovation.

"We now have a bit of parallel priorities in terms of the transition toward an SEA regulatory process in the oil and gas sector, which has a lot of disadvantages for environmental safeguards in Nigeria. Why are the regulators and developers working against us instead of agreeing to integrate SEA to support the existing EIA system?"—Participant (Q)

In trying to promote the use of SEA, the MDAs and ENGOs tend to exaggerate or promote imaginary environmental issues, and some developers can view it as a way of giving a kind of whitewash campaign to hydrocarbon development that is central to the development of Nigeria's economy"—Participant (T)

Elaborating further on why the incumbent regime actors appeared to operate in isolation or even in opposition to niche actors, one participant candidly stated:

"There is an apparent propensity to downplay the necessity of SEA regulatory process in the oil and gas industry by the regulators due to increasing lobbying from the developers to maintain the current status quo of the environmental management practice in the sector....this stifle a meaningful relationship and collaboration between niche and the incumbent regime actors"—Participant (K)

From the foregoing insights, the regulators appear to be perversely incentivized to downplay the benefits of SEA to make the prevailing EIA regime appear more environmentally friendly to their clients—namely, developers. This lack of strong collaboration means that the niche actors may aim for limited niche development by leveraging upon the evolving factors at the landscape level to create broader public legitimacy for SEA innovation and ensure they are eventually accepted by the actors

within the regime.

8.6.5 Learning and knowledge development

Research participants acknowledged that learning and knowledge development could help facilitate the transition to SEA regulatory processes in Nigeria's oil and gas industry. In particular, perceived "best case examples" are highlighted in this context, which can be used as benchmarks for comparison of learning processes for SEA development. Such examples include international cases. In web comments, Canada was particularly cited as a positive example of how a transition in environmental management practice toward SEA complements the traditional EIA regime in oil and gas planning and development. The following quotes underscore the participants' perspectives on the importance of the learning process in facilitating the transition toward SEA:

"I think creating awareness about the potential added value of SEA in the oil and gas sector could help in the transition toward such regulatory process in Nigeria" —Participant (T)

"Learning and knowledge development regarding what SEA means and what it can deliver in the oil and gas planning exploration and development would aid in the development of SEA innovation in Nigeria"—Participant (Q)

"Nigeria can draw valuable lessons from countries like Canada, which have transitioned from managing the impacts of individual oil and gas projects to adopting a more strategic approach... I believe that by learning from this example, Nigeria can facilitate a similar shift towards integrating an SEA regime within its petroleum sector" —Participant (U)

These insights reveal how participants perceive the role of knowledge acquisition, sharing and application as pivotal elements in advancing SEA innovation within Nigeria's oil and gas sector. This implies that the well-established learning from other jurisdictions may underpin the niche toward opening up to SEA innovation in Nigeria. This process may involve acquiring and sharing knowledge through encounters, communicative interaction and collaborative action by multiple niche-regime actors. Such a dynamic exchange is

essential for building the capacity and momentum to effectively upscale the development of SEA innovation, leading to its integration into Nigeria's oil and gas environmental management framework.

8.7 Potential barriers to strategic transition in the oil and gas sector

This section explores the opinions of the research participants in relation to the potential barriers that could inhibit the transition toward SEA in oil and gas planning, regulation and development decision-making. Accordingly, five categories were highlighted as the main factors that could constrain a successful SEA integration in Nigeria, as illustrated in Table 9.3 below. It was acknowledged that overcoming these challenges is necessary in order to mainstream a strategic approach into the context of oil and gas development assessment and decision-making.

8.7.1 The dominant of the EIA practice

Participants were almost equally divided on whether the prevailing EIA practice in Nigeria might hinder the transition to an SEA regulatory process in the oil and gas sector. Participants from the ENGO, academic and MDAs acknowledged that the entrenched culture of EIA could significantly constrain the potential for advancing SEA in this sector. The views of these participants are presented below:

"You know when people are comfortable with a particular way of doing things such as the EIA practice in the oil and gas industry... it is often difficult to change"—Participant (V)

"The EIA has been in place for more than three decades... I think it will take some serious effort to convince the incumbent EIA regime actors in the petroleum sector on the need for another environmental assessment process"—Participant (Q)

"I think integrating an SEA is likely to face some sort of backlash due to the convergence of interests...the regulators are used to the long-standing tradition of EIA mindset. Secondly, the oil companies or developers may lobby the regulators to keep the EIA status quo"—

Participant (T)

"We know that the developers can use their corporate power and influence to frustrate a process that might demand environmental accountability, which goes in their way of achieving their interests [economic]"—Participant (P)

However, participants from the government and the industry cited a number of concerns regarding the transition toward the SEA regulatory process in oil and gas planning, regulation and development decision-making. For example, an industry participant explained that:

"I do not see the fault of the existing EIA regime practice... so why do we need another layer of regulatory process in the oil and gas sector?"—Participant (N)

Another industry participant echoed a similar concern by attributing the transition toward SEA as another layer of bureaucracy with which developers would have to engage other than the current EIA process. The view of this participant was succinctly elaborated below:

"SEA could become another unnecessary procedure when there is already an EIA system in the oil and gas"—Participant (O)

The government participants also clearly acknowledged the uncertainties of a novel approach such as SEA in the petroleum industry. For instance, one participant explained that:

"I think there isn't enough clarity in terms of whether what we are transitioning could have a much better value in the oil and gas planning, regulation and development... until this issue of clarity is addressed, the status quo of the EIA practice would hardly be overcome, and this may likely pose a change to the prospects for a transition"—Participant (D)

In sum, the results reveal significant concern that the entrenched EIA culture within

Nigeria's petroleum sector, coupled with the uncertainty surrounding such a novel approach as well as the perception of SEA as yet another bureaucratic hurdle, may potentially inhibit the prospects of the transition toward more strategic forms of planning and environmental assessment beyond the project-level practice. Additionally, it was found that the industry players may likely leverage their considerable corporate influence to lobby for the continuation of the existing project-based EIA regime. This anticipated resistance from both incumbent actors within the EIA institutional framework and industry stakeholders underscores the difficulties in introducing higher-level strategic environmental assessments in Nigeria's oil and gas industry.

8.7.2 Technical-know how

Participants highlighted a lack of technical expertise in SEA within government regulatory organizations as a potential barrier to strategic transition in Nigeria. They expressed concerns that SEA might not be effectively integrated without adequately trained staff, particularly considering the innovation that a strategic thinking approach aims to introduce in oil and gas planning, regulation and development decision-making. Although the government has made efforts to sponsor staff attendance at international training and workshops on environmental issues and response strategies, such as those organized by UNEP and the World Bank, research participants indicated that there remains a significant gap in the skills required to design, conduct and monitor SEA-related activities in the petroleum sector. Table 8.4 summarizes the participants' views on this on this theme.

Table 8.4: Comments illustrating lack of technical skill as a barrier to SEA integration

<i>Participants</i>	<i>Quotations</i>
<i>Participant D</i>	<i>"There are no adequate skilled personnel who are specialists in SEA within government regulatory organizations responsible for environmental management and protection in the oil and gas sector."</i>
<i>Participant M</i>	<i>"I believe it is one thing to shift from the project-level EIA to SEA regulatory procedure and another to have the human resource or manpower to design, conduct and monitor SEA-related activities in the oil and gas sector"</i>
<i>Participant T</i>	<i>"Nigeria does not have sufficient professional consultants who have technical and practical experience of SEA-related processes, and this could stifle the prospect of the transition toward SEA regulatory regime in the oil and gas sector."</i>
<i>Participant V</i>	<i>"The staff within the environmental regulatory regime need to be adequately trained in SEA; otherwise, the hype about SEA approach to planning and impact assessment in the petroleum sector would be futile."</i>

It is evident from the comments that one of the key factors that could shape the prospects of the transition from the traditional project-level EIA to an SEA regulatory procedure in Nigeria is the availability of sufficient SEA knowledge and experience. As a higher-order environmental assessment and decision-making tool, SEA requires a strategic approach to regulation in the oil and gas sector. This transition would necessitate comprehensive training for regulators and heightened awareness among key relevant stakeholders. Such training would focus on the step-by-step approach to designing, managing and executing the SEA process, ensuring that all stakeholders are well-equipped with the knowledge and/or awareness of such a novel approach to support this shift towards strategic environmental management in the oil and gas industry.

8.7.3 Legislation

Participants acknowledged that the absence of a legislative framework could hinder the prospects of the transition toward an SEA regulatory approach in the oil and gas planning, regulation and development decision-making. An ENGO participant noted that:

"I think the major challenge is the fact that SEA is a new environmental assessment, and currently, there is no provision to guide its adoption in Nigeria"—Participant (K)

This view was further reinforced by the federal government participant who argued that:

"Even though the idea of integrating SEA into the oil and gas policy sector sounds good, the absence of supporting legislation will likely pose an obstacle to its implementation in the foreseeable future"—participant (A)

Moreover, the question was asked about the potential to integrate SEA into the oil and gas policy sector through the existing EIA legislative provision. One interviewee from the International Development Organisation responded by stating that:

"Although there is no explicit legislation for SEA... the SEA can still be considered within the existing EIA legislation since the process shares the same principles. If this option is not possible, then the lack of exclusive legislation for SEA may pose a challenge to its effective adoption"—Participant (U)

In contrast to the above commentary, another research participant objected to using the existing EIA legislation to implement environmental assessment of high-level strategies. For instance, a research participant from the government regulatory agency argued that.

"I do not support the use of EIA legislation for SEA because it may likely be a recipe for confusion. I think there is a need for exclusive legislation and procedural methods and guidelines for SEA implementation in the oil and gas industry"—Participant (B)

The interview findings suggest that the absence of legislation could potentially inhibit

the prospects of the transition from the project-level EIA to SEA in Nigeria's oil and gas industry. This means that without a robust legal framework, the prospect of institutionalising the SEA regulatory process remains uncertain and fragmented, leading to inconsistencies in implementation and enforcement. This legislative gap not only undermines the potential for SEA to be systematically integrated into environmental management but may also limit the ability of regulatory bodies to mandate its application across the sector. Other participants also expressed concern that SEA could be relegated to a voluntary or supplementary role without clear legislative backing, diminishing its impact and effectiveness. This may hinder efforts to align environmental assessment processes with international standards, ultimately affecting Nigeria's ability to attract global investment and meet sustainability goals in the oil and gas sector.

8.7.4 Institutional relationship(s) between actors

Another commonly cited barrier to the strategic transition in Nigeria's petroleum sector is the lack of collaboration and engagement among key actors in the decision-making process. It was found that the ongoing power dynamics within the EIA administrative regime will likely shape the pace of the strategic transition in the petroleum sector. The following quotes provide further insight into the participants' perspectives on this theme.

"The regulatory actors responsible for environmental management and protection in Nigeria's oil and gas industry are often at loggerheads with each other, and this may affect the successful strategic transition"—Participant (H)

"The integration of the SEA process is not likely to result in having winners and losses within the petroleum industry, and I believe without a synergistic relation between the regulatory actors, industry and support of other relevant stakeholders, the prospects of a transition to SEA may be jeopardised"—Participant (S)

"Policy transition such as SEA is supposed to draw together multiple agencies and several actors to achieve its intended value. Currently, I do

not see this prospect in the current institutional and regulatory regime for environmental management and protection in the oil and gas industry"—Participant (M)

The foregoing insights highlight a critical concern about the lack of collaboration and engagement among key actors, which could significantly impede the transition toward a more strategic approach to planning and upstream environmental assessment in Nigeria's oil and gas industry. The lack of actors' collaboration and engagement may result in a failure to build the necessary consensus and support for SEA initiatives, leading to resistance from powerful actors who may perceive SEA as a threat to their operational interests. This resistance could further exacerbate the difficulties in implementing a strategic EA approach, as it would hinder the development of a shared vision and the establishment of common goals for sustainable development in the oil and gas sector.

In addition, the absence of a collaborative framework could prevent the exchange of knowledge and best practices between stakeholders, limiting the capacity to innovate and adapt to new environmental policy approach. This, in turn, could undermine the potential benefits of SEA, such as its ability to provide a broader, long-term perspective on the environmental impacts of oil and gas development initiatives and facilitate more informed and sustainable decision-making. Therefore, the lack of actor and stakeholder collaboration and engagement represents a pivotal barrier to SEA's successful adoption and integration in Nigeria's oil and gas industry, jeopardising the prospects for a more strategic and sustainable approach to environmental management practice.

In sum, it can be argued that effective collaboration is essential for aligning the diverse interests and perspectives of government agencies, industry players, environmental groups and local communities. Without such collaboration and engagement, transitioning from the current project-based EIA regime to a more strategic regulatory procedure in the environmental management practice in the oil and gas sector will likely face substantial challenges.

8.7.5 Political will

Research participants noted that the lack of political-will will likely hinder a strategic transition in Nigeria's oil and gas policy framework. As pointed out by two participants from the state ministry of Environment and the Nigerian Coalition for Gas and Oil in the Niger Delta:

"I believe a stronger political will is needed to facilitate a transition toward an SEA regime in Nigeria's oil and gas sector"—Participant (S)

"In Nigeria... without the political commitment from the top-level of the federal government policy-making, SEA idea cannot see the light of the day"—Participant (H)

In addition to what has been articulated above, another interviewee from the International Donor Organisation observed that:

"The developers are powerful and wield enormous resources to incentivise environmental decisions and outcomes in their favour... This means that they may use their power to undermine the prospects of integrating an SEA in the petroleum sector until the government is willing to demonstrate a strong political will"—Participant (U)

In a similar vein, another participant from the Environmental NGO concluded that:

"The success or failure of a strategic transition in the oil and gas policy sector will depend on a strong political commitment to stand above the interests of the powerful corporation"—Participant (Q)

Overall, the interview findings unearth that strong political will is important in aiding the transition from project-level EIA to a strategic approach in Nigeria's oil and gas development assessment and decision-making. This suggests that in situations where key policy-makers do not recognize the potential relevance of strategic thinking in energy planning and development, the SEA process may not be fully integrated into the regulatory framework, potentially impacting decisions on where and when to open new frontiers for oil and gas exploration and development.

8.8 Chapter Summary

The aim of this chapter was to comprehensively present and analyse the findings from interviews with expert practitioners, regulators, MDA members, ENGOs and local village heads. Through targeted analytical questions developed based on the MLP, the research participants were asked to give their views on three key themes: EIA regime practice, landscape influences and the prospect of the maturity of the niche toward opening up to SEA innovation in the oil and gas policy sector. In relation to the prevailing EIA regime in the old frontier of the oil and gas development in the Niger Delta region, the majority of the participants acknowledged that the EIA practice plays a critical role in providing a conceptual framework for the regulatory authorities and developers to assess the potential environmental impacts of oil and gas project development proposals before the commencement of such development initiatives. The participants also confirmed that the current EIA practice enabled the formulation of measures to mitigate, prevent or offset potential environmental effects associated with oil and gas project development in the Niger Delta region.

Notwithstanding the benefits of the existing EIA practice, the participants also raised doubts and concerns about the capacity of the project-driven EIA to ensure adequate environmental protection in the Niger Delta region. The study discovered that the EIA is often considered too late in the oil and gas planning process to make significant differences in the outcome of energy development proposals, which have already been concluded at the strategic tier of PPP-making, effectively invalidating other critical and eventual decision options. The participants noted that the EIA appear to be reactive and narrowly focus on individual projects, which also limits its ability to reconcile cumulative and regional environmental impacts of multiple projects, including broader policy issues associated with oil and gas development in the Niger Delta region. Moreover, participants cited numerous shortcomings regarding public consultation and engagement in the oil and gas EIA-related process. It was found that the actors responsible for initiating public consultation and participation do not give significant importance to involving the relevant stakeholders in the EIAs. In essence, the public consultation and engagement in the oil and gas EIA-related process tend to be shallow

and passive exercises rather than a meaningful opportunity for early consultation with local communities in which the developers can demonstrate how potential oil and gas development initiatives would benefit and impact local communities and how the potential impacts of a large network of hydrocarbon projects would be mitigated.

Apart from the inherent shortcomings of the EIA practice in the petroleum sector, the interviewees further noted that governance issues underlie the current EIA regime. Most interviewees believe the current EIA institutional and governance regime induces a recipe for poor environmental management practice. The EIA regime is characterised by value conflicts, rigid institutions, disparate objectives, politics, and power constellations due to struggles for legitimacy among the two regulatory bodies responsible for overseeing the EIA process in the petroleum sector. The study reveals how the EIA institutional self-reinforcing mechanisms supplemented by political influence and interference of powerful actors have created and maintained political and economic path-dependent trajectories that correspond with their interests at the expense of informed environmental licensing and environmental assessment in the oil and gas sector. This practice resulted in oil and gas development assessment and decision-making becoming lock-ins within the EIA administration regime, thereby affecting the prime objective of sound environmental management practice.

Against the backdrop of the constraints of the project-based regulatory regime in the Niger Delta, the study unearthed the rationale and the need for a shift toward a more strategic and integrative approach to strengthen and solve the limitations of existing project-driven EIA system and support decisions about the opening the frontier to potential oil and gas development in Nigeria. These insights lead to the second theme — the landscape influences, emergent factors or conditions that could help facilitate the transition towards a strategic-level approach to oil and gas development assessment and decision-making. Most participants noted that the learning opportunities from the prevailing EIA practice in the old frontier of hydrocarbon exploration and development, sustainability and climate change concerns as well as the increasing demands for SEA implementation as a pre-condition for funding oil and gas development by multilateral development agencies could be the key rationales and positive forces that will drive the

transition toward an SEA process in oil and gas planning, regulation and development.

The third theme considers the prospect of the maturity of the niche toward opening up to SEA innovation in the oil and gas sector. The findings of this study indicated a noticeable trend of positive expectations for SEA development in Nigeria. The positive expectations among the participants were driven mainly by the need for an improved environmental assessment process in the oil and gas policy sector. The imperative for improved environmental performance by industrial operators is especially pertinent given the increasing interest in exploring the new energy frontier regions for potential hydrocarbon drilling activities. The participants further acknowledged that the PIA—which outlines an ambitious plan to expand oil and gas development into the new frontier was seen as a critical window of opportunity under which the SEA innovation could be developed in Nigeria. The participants also expressed strong optimism that although SEA is currently in its conceptual and pre-development stages, the PIA provides a conducive policy environment for promoting SEA in the oil and gas industry. The study discovered the emergence of network formation and interaction among the niche actors, such as the representatives of the multilateral agencies, ENGOs, and expert practitioners, highlighting the potential expectations of SEA innovation to be developed at the fringe of the prevailing oil and gas EIA regime. Whilst the niche-niche interaction and collaboration appear to be strong, at one end of this spectrum, collaboration and relationship between niche and regime actors toward developing SEA innovation was significantly less strong. Consequently, the participants identified learning and knowledge acquisition as a positive example of facilitating SEA innovation within Nigeria's oil and gas sector.

Finally, the participants mentioned several potential barriers to the transition toward SEA in oil and gas planning, regulation and decision-making. The barriers include the dominance of the EIA practice, technical know-how, institutional relationship(s) between actors and political will. In sum, the results reveal that the aggregates of these factors may contribute to the resistance to strategic transition in environmental management practice in the oil and gas sector. As a result, the study suggests that overcoming these challenges is necessary in order to mainstream a strategic approach

into the context of oil and gas development assessment and decision-making.

CHAPTER NINE

Discussion and Synthesis of Findings

9.1 Introduction

The preceding three chapters have presented the findings derived from the questionnaires and semi-structured interviews conducted to gather primary data. This chapter serves as a focal point where the results from both quantitative and qualitative methodologies are analysed through the lens of multi-level perspectives of transition processes: regime, landscape influence and niche innovation. While some of the themes were informed by existing literature, additional novel insights emerged from the discussion and synthesis of empirical findings, which are deemed essential for fulfilling the overarching objectives of this research. Consequently, this chapter elaborates on the transition-based framework that illustrates how a transition from project-level assessment to a strategic approach could occur in Nigeria's oil and gas environmental management regime. The chapter concludes by highlighting the potential of SEA as a forward-looking and integrated approach that could help inform the preparation of energy development strategy and environmental management framework for the new frontier regions and, in doing so, identify strategies and priorities for future management and development while enhancing the efficacy of traditional project-level EIA.

9.2 The EIA regime in the oil and gas sector

This section discusses the EIA regime in Nigeria's oil and gas sector. It is structured around several key themes, including the legal framework governing EIA, the institutional and regulatory arrangements, the centrality of EIA to oil and gas environmental decision-making, issues related to path-dependency and lock-in in environmental management, stakeholder consultation and engagement. It also encapsulates discussion about the limitations of the current EIA practice in proactively planning and managing oil and gas environmental impacts and the need for strategic EA to strengthen and offset its shortcomings.

9.2.1 Reflection on EIA legislative framework

The findings in this study revealed that the principles of EIA have been applied in Nigeria's oil and gas sector since 1969 (FRN, 1992), but the formal legislation underpinning the environmental licensing and environmental impact assessment began in 1992 and onwards (Anifowose et al., 2016). The legal framework prescribed general rules, including specific guidelines of consideration and requirements for environmental licensing and impact assessment processes for any proposed oil and gas project development. In particular, the EIA Act sub-section 4 requires any developer to apply to the competent authorities in writing before embarking on the proposed oil and gas development initiative. The participants reported that the legally binding nature of the EIA regime in the oil and gas sector set the bar by which the proponents are compelled to prepare an EIA report before undertaking any oil and gas drilling activities in Nigeria. Essentially, the legally binding nature of the EIA regime has greater importance against a proponent that proceeds with hydrocarbon drilling activities without EIA approval. The Act prohibits the commencement of an oil and gas project development without compliance with EIA consent and approval conditions. In the event of non-compliance, the EIA Act states that such development can be halted, and the competent authority is empowered to undertake a retrospective EIA study. In this context, if such project development is later found to cause adverse environmental impacts, a 'polluter pays principle' comes into play. This principle typically compels the responsible developer or oil company to bear financial responsibility for environmental damage in the form of monetary value. The enforcement of these penalties squarely rests within the jurisdiction of the implementing bodies overseeing environmental regulations.

The results corroborate the findings of Ogunba (2004) and Onuora and Nnubia (2021), who argued that where a legal framework exists, the EIA requirements can be legally binding on the oil companies or developers to ensure that the projects are drawn up in line with mitigation measures that have already been environment-proofed by the competent authority. Nonetheless, there is a need to integrate strategic EA into oil and gas planning, regulation and development instead of relying solely on traditional environmental regulations.

Although the evidence from this study revealed that the Nigerian government enacted the 2021 Petroleum Industry Act, which outlines an ambitious plan to expand oil and gas development into new frontier basin fields that possess significant hydrocarbon resource potential, the EIA regime appears to be the only appropriate action-forcing mechanism to ensure environmental protection and management in the new frontiers. However, transition theory posits that contemporary societal challenges such as environmental degradation, climate change, sustainability concerns and biodiversity loss are dynamic rather than static phenomena (Elzen et al., 2004; Van den Bergh and Bruinsma, 2008; Grin et al., 2010). Addressing these issues requires a transition to more innovative and proactive strategies (Geels et al., 2017; Markard et al., 2012) that are integrated within a robust legislative framework.

In sum, it is reasonable to argue that an inefficient legal framework underpins the current environmental management response to the challenges posed by oil and gas exploration and development in Nigeria. Thus, there is a need to reassess the framework that governs the environmental management regime through EIA practice. This reassessment should facilitate the incorporation of necessary modifications to address the potential environmental and sustainability issues that may be associated with oil and gas exploration and development, particularly in the new frontiers, rather than these new trends of challenges being manipulated to conform to the existing environmental management framework, which has become locked in EIA path-dependent trajectory in Nigeria.

9.2.2 Institutional and regulatory framework

Nigeria has a twin-track EIA system in the oil and gas industry. This arrangement has resulted in a multi-level and multi-actor EIA administrative regime wherein an oil company or proponent planning to embark on oil and gas project development is required to obtain EIA permits or approvals from the Ministry of the Environment and the Department of Petroleum Resources, now known as the Nigerian Upstream Petroleum Regulatory Commission in accordance with the EIA Decree 86 of 1992 and the Petroleum Act of 1969. The twin-track EIA system was designed to promote the rigour of the assessment process through a dual review mechanism, allowing both agencies the

authority to approve or reject proposals for oil and gas project developments that may adversely impact the ecological environment. However, a significant finding from this research revealed inconsistency in governance and administration, particularly in how the responsible bodies interact and coordinate in regulating the two-stage EIA processes. Many participants in the study highlighted the absence of clearly defined mandates and responsibilities for the institutional management of EIA in the oil and gas industry. It was observed that instead of fostering a collaborative relationship with a clear focus, the agencies tasked with overseeing the EIA process often grapple with challenges related to the duplication of efforts and overlapping responsibilities. Consequently, proponents are often required to navigate multiple, redundant EIA permitting and approval processes, engaging with numerous regulatory authorities.

The analysis in Chapter 8, section 8.2.1 revealed that the multi-jurisdictional approach to the EIA process in the oil and gas sector is generally perceived as a patchwork regulatory system that promotes rigid bureaucracy in the approval procedure, which undermines the efficiency of the oil and gas EIA process. The manifestation of the regulatory hurdles was attributed to the inter-agency contestation of power and legitimacy in order to establish their definitive authority as competent regulatory bodies to oversee EIA-related processes. The contestation for administrative superiority among the regulatory actors is fuelled by value conflicts, divergent interests and values attached to environmental protection and management. This makes the EIA institutional administration ingrained in a self-reinforcing culture of conflictual power struggles and frictions because actors do not feel the need to cooperate and coordinate in the decision-making process but rather promote and consolidate their underlying egocentric power disposition by creating and maintaining suitable pathways in achieving their perceived interest. This density of non-conscious and, in many cases, conscious behaviour within the EIA administration regime is why institutional lock-ins occur in oil and gas environmental management practice, leading to sub-optimal decision outcomes that could not deal with persistent environmental and sustainability challenges in the oil and gas sector.

Moreover, the duplication of responsibilities between the two regulatory bodies often hampers effective enforcement, as it becomes ambiguous which agency holds greater

power to oversee the enforcement process. Consequently, this situation may create opportunities for oil companies to evade their environmental accountability. Ambituuni et al. (2014) argue that the multi-agency regulatory framework within the oil and gas sector is largely ineffective, resulting in conflicting and overlapping regulations that lead to a lack of coordination. Furthermore, while the presence of multiple regulatory agencies and their overlapping functions can be attributed to inadequate governance of EIA institutions, they may also stem from vested interests. This situation tends to favour oil companies or proponents, granting them a degree of immunity from the negative environmental impacts associated with their operations in the Niger Delta region (Obi, 2019). Transition management literature underscores the significance of the transformative capacity of institutions and well-coordinated governance mechanisms to help shape deliberative and collaborative efforts among diverse stakeholders to address and facilitate the pace and outcome of transitions toward more sustainable strategies (Loorbach et al., 2020; Rotmans et al., 2001; Grin et al., 2010).

9.2.3 The role of EIA in oil and gas decision-making

As presented in Chapter Eight, section 8.2, the EIA is perceived as a tool to inform the decision-making about oil and gas project design and consent. Most research participants from government agencies stated that the EIA helped promote environmental consciousness in decision-making and enabled the regulatory authority to determine the environmental and technical viability of the oil and gas project development initiative in order to establish planning and mitigation conditions to be fulfilled by the development before consent approval was granted. This view of the positive characteristics of the EIA revealed that it had some degree of influence on consent decisions and project design modifications before formal applications. Likewise, the results from the practitioner's survey, as presented in Chapter Seven, also acknowledged that EIA moderately affected decision-making by influencing project planning and redesign but does not influence decisions regarding project locations, alternative considerations, or cumulative impacts. In contrast, the outcomes of the community survey in Chapter Six revealed that the EIA process was unable to effectively conciliate between oil and gas development and environmental quality in decision-making. It emerged that the perception of the regulators, developers and practitioners

that EIA is an innovation in environmental protection and management does not reflect the general expectations of the locals in the oil-producing communities in the Niger Delta region that have been disproportionately affected by the oil and gas exploration, production and operations. As such, the EIA is perceived as a mechanism for environmental licensing—an avenue for administrative and regulatory compliance — rather than having a substantial effect on decisions regarding project locations or alternative considerations.

Nevertheless, evidence in this study indicates that though the EIA may not have played a central role in the overall planning and decision-making process to inform location-based or consideration of alternatives, but the information generated through the EIA process offers valuable contributions to competent authorities and developers, particularly in making rational and informed decisions about consent or project redesign and establishment of appropriate management measures to address some of the challenges posed by oil and gas project development in Niger Delta region. These findings coincides with that of Leknes (2001), who investigated the role of EIA in the decision process concerning oil and gas development in Norway and concluded that although EIA played a minor role in the decision-making process, it enabled the conditions for which potential environmental consequences that may arise from the project implementation could be mitigated. The findings are also consistent with those of Vilardo and Rovere (2018), who evaluated the effect of the EIA on decision-making for oil and gas project development in the Brazilian pre-salt province. They concluded that while EIA played a moderate rather than substantial role in the decision-making process, it facilitated early identification of potential project impacts and conditions developers must fulfil before committing to a particular course of action. The results are consistent with the analysis conducted by Baker and Jones (2013), which examined the role of EIA in the environmental decision-making processes related to oil and gas project development. Their study concluded that while EIA can lead to modifications in project design, but those changes are relatively minor.

9.2.4 Reflection on path-dependencies and lock-ins

From the various accounts provided through questionnaires and interviews analysis in Chapters 7 and 8, the findings revealed a clear acknowledgement of path-dependencies in Nigeria's oil and gas EIA regime. Research participants stated that decisions about the environmental licensing and environmental impact assessment of oil and gas development are predominantly made based on political and economic factors (See section 8.2.2). Therefore, rather than giving weight to the environmental assessment of the risk, adequacy and appropriateness of the oil and gas rights issuance process, political decisions and economic viability or profitability determine the priorities and pathways of government decision-making regarding where and when to open new areas to potential hydrocarbon drilling activities. This study confirms that entrenched path-dependent practices in hydrocarbon development often result in predetermined political and economic decisions. These decisions frequently pre-empt the outcomes of EIA, and if the results are politically inconvenient, they are often ignored or circumvented.

According to Hanger-Kopp et al. (2022), path-dependency embodies a process characterized by a persistent trajectory where past motives, decisions or contingent events pre-determine what further decisions or actions may be taken. In this sense, the environmental governance regime becomes locked-in in self-reinforcing pathways that narrowly shape the decision-making process, limiting the potential to explore diverse approaches or pivot from pre-existing trajectories, including the prospects for adapting more innovative and sustainable strategies. Indeed, the key factor perpetuating path-dependent trajectories in Nigeria is that EIA practice remains constrained by well-established governance and institutional arrangements that are rooted in self-reinforcing mechanisms, concentration of powers and the discretionary role of the decision-makers in oil and gas environmental management decisions. For example, in entrenching the culture of path-dependent trajectory in decisions about the environmental licensing and environmental impact assessment of oil and gas development, decision-makers harness their technical and bureaucratic edge to bear in an attempt to ensure alignment of decision outcomes with their interests through ad-hoc and quick measures to avoid policy lock-ins.

The findings indicate that when citizens and environmental NGOs mobilize to advocate for ecological protection in the Niger Delta, decision-makers often adopt a paternalistic approach. They may acknowledge and analyze public objections but ultimately dismiss these concerns, framing citizen opposition to oil and gas drilling licenses as a hindrance to national economic development objectives. On the one hand, the persistent mobilization of stakeholders both within and outside the Niger Delta against the lack of environmental accountability related to oil and gas development leads to a situation where the government seeks to rationalize and legitimize its project proposals. This dynamic frequently results in environmental management decisions within the oil and gas sector becoming locked-in. Conversely, many interviewees noted that industry actors with significant lobbying power do not express similar concerns or support citizen efforts for environmental quality. Instead, they leverage their political influence and technical expertise to secure oil and gas production licenses. Additionally, quantitative findings provide corroborative evidence that the entrenched practices and path-dependent trajectories within the EIA governance framework, heavily influenced by political and economic factors, dictate the priorities and approaches to environmental assessment and management in Nigeria's oil and gas industry. This often leads to the justification of controversial decisions or unfavourable EIA outcomes, as discussed in Chapter 7, further aggravating environmental management challenges. Consequently, the paternalistic attitude of decision-makers within the EIA framework illustrates a power dynamic in which decisions are made without adequately incorporating or valuing citizen input.

The findings from this study are consistent with Lekens' (2001) argument that the EIA process is significantly influenced by political dynamics, particularly in the context of oil and gas development. It is also in consonance with Mwanyoka et al.'s (2019) characterization that political and economic factors play a substantial role in shaping the behaviour of regulatory actors involved in the EIA process for the oil and gas industry, including the ultimate environmental management decisions in the global south. Transition management theory highlights the imperative of mapping the competing complexities of societal development agendas, including decision-makers, networks of stakeholders with vested interests, socio-political and governance conditions, institutional administrative arrangements, and the challenges posed by path-

dependencies and lock-ins to shape the pace and outcome of sustainability transitions (Markard et al., 2012; Loorbach 2007; Geels et al., 2017;).

9.2.5 Public consultation and engagement

Barker and Jones (2013) stressed the crucial role of public consultation and engagement in oil and gas environmental decision-making. The findings presented in chapters 6, 7, and 8 of this study reveal that the oil and gas EIAs are conceived and designed by developers and consultants, often without adequate public involvement, and are subsequently endorsed by the regulatory agencies. Several barriers can be linked to a lack of effective and meaningful public consultation and engagement in oil and gas EIA-related processes, including limited access to both online and physical information regarding proposed project developments, a general lack of awareness, the financial burden of travelling to public meetings and the challenges associated with obtaining expert assistance to navigate EIA documents. In contrast, insights from interviews suggest that the insufficient public involvement in oil and gas EIAs is largely due to the absence of legal mandates requiring developers to consult with and engage the affected communities before the formal submission of EIA reports to the relevant authorities. For example, the competent authorities conduct only the minimum statutory consultations necessary to assess project compliance with EIA regulations during the scoping phase. While they may choose to involve the public, this is not a legal requirement. This situation can be interpreted as a form of retroactive public consultation, where the public is invited to provide feedback on a draft EIA late, after critical decisions—have already been made by experts, often without incorporating public perspectives into the final project decisions. Equally, it is fair to argue that this type of public participation can be described as a mere procedural formality rather than a genuine opportunity to improve or refine project proposals.

The results of this study are consistent with the conclusions reached by Ingelson and Nwapi (2014), which suggest that public consultation and engagement in oil and gas EIA-related processes in Nigeria are of limited importance. The authors further emphasize a significant concern regarding public involvement in this sector: the prevailing perception that such participation may lead to increased costs, extended project timelines, and

potential delays in project approvals. Moreover, achieving consensus among the public poses a challenge, as individuals hold a diverse range of interests, perspectives, and values during the EIA process. Industry stakeholders have indicated that these consultation and engagement initiatives may unintentionally foster unrealistic expectations among the public, which the industry may find challenging to meet, potentially leading to backlash that could disrupt oil and gas drilling activities. The continued practice of excluding the public from these consultation and engagement processes limits the opportunity to integrate stakeholders' varied viewpoints and values into the environmental decision-making framework of the oil and gas sector, thereby compromising the essential principles of inclusivity, transparency, learning, and accountability.

There is a pressing necessity for the establishment of mechanisms that empower the public, particularly the locals within oil-producing communities in the Niger Delta region, to influence decisions involving large-scale hydrocarbon development. The involvement of the public in this context is crucial, as their alternative perspectives and knowledge can significantly enhance the evaluation of potential environmental impacts associated with proposed oil and gas projects. This engagement may also facilitate the development of effective mitigation strategies to address the identified environmental consequences. To achieve this, it is essential that the public is adequately informed. Therefore, developers are required to adopt a proactive approach to disseminating information rather than resorting to delayed responses and reactive participation processes. Moreover, the information provided must be timely, accessible, comprehensive, sufficient and presented in a manner that is easily understandable to the community members.

9.2.6 Reflections on limitations of EIA practice in the oil and gas industry

The results of this study indicate that, although the EIA practice in Nigeria's oil and gas sector is perceived to possess certain positive characteristics, it is not devoid of significant limitations and challenges (refer to section 8.2.4). Through a comprehensive analysis of both documentary evidence and interviews, it was revealed that the EIA practice in Nigeria's oil and gas industry is typically undertaken at the project level of

planning and assessment. The consideration of the environmental impact of project development tends to rely significantly on a unidirectional flow of information and occurs only after strategic actions and commitments have been made at the highest policy-making levels. The prevailing sentiment among the research participants was that the EIA practice has entrenched planning and assessment patterns in which little attention is given to how the sites for oil and gas project installation were chosen. The findings further revealed that in the case of projects that are not tied to specific locations, the most suitable and viable alternatives are often overlooked as the EIA can no longer prevent the siting of oil and gas projects in environmentally sensitive areas because the key decisions have been made at the strategic level of decision-making. This makes the EIA a reactive instrument rather than a proactive decision-support mechanism that can drive the decision process towards more sustainable outcomes. When the qualitative findings were corroborated with the practitioner's survey results presented in Chapter 7, it became evident that most participants spoke to the limitations of EIA, particularly in terms of addressing the regional and cumulative or transboundary environmental consequences associated with multiple oil and gas exploration and development in the Niger Delta region.

The results of this research align with the assertions by Fidler and Noble (2012), Prideaux and Prideaux (2016) and Fidler and Noble (2013) that the traditional project-level EIA cannot comprehensively account for a more holistic perspective on strategic issues and the long-term cumulatively-induced impacts of hydrocarbon development activities and alternative project design or site location and ensure that energy development decisions are set within a broader environmental planning and management framework. This raises questions and concerns about whether the project-level EIA can be claimed to be an innovative environmental governance mechanism that can facilitate a coordinated approach to oil and gas planning and development in the new frontiers and carefully thought-out environmental management framework to achieve the desired outcome. Considering the foregoing limitations associated with the EIA regulatory regime in the Niger Delta region, the research participants acknowledged the imperative of a transition toward a more strategic approach to help plan for oil and gas exploration and development in the new frontiers. SEA is a forward and integrated environmental

assessment process that can potentially address the environmental liability cost of oil and gas exploration and development early in the planning process before critical decisions and commitments are taken and individual project proposals are accepted at the strategic tier of policies and plans (Fidler and Noble, 2012; Lamorgese et al., 2015; Vilardo et al., 2020; Kapoor et al. 2021). In principle, SEA can proactively inform oil and gas PPP development initiatives at the outset of the decision-making process while providing context for more informed, efficient and focused project-level assessments and decisions.

9.3 Landscape drivers and influence for strategic transition in the oil and gas industry

Based on quantitative and qualitative data analysis, four key potential motives or critical factors have been identified that may facilitate the transition to a more strategic approach to planning and environmental assessment in Nigeria's oil and gas environmental management regime. These factors encompass a range of broader exogenous influences, including the growing demand for SEA as a prerequisite for securing funding from international development organizations, the pressing challenges posed by climate change, considerations of sustainability, and endogenous landscape trends related to learning potential from the prevailing EIA practice in the old frontier of hydrocarbon exploration and development.

9.3.1 Exogenous factor one: Multilateral Development Agencies

Historically, multilateral development agencies have been instrumental in advancing EIA practices in low and middle-income countries, serving as a mechanism to protect environmental interests and enhance environmental governance (Alshuwaikhat, 2005; Abaza et al., 2004; World Bank, 2019). Currently, EIA has become an integral component of the planning processes in numerous countries (Abaza et al., 2004). However, despite the existence of robust EIA guidelines and legislative frameworks, environmental degradation associated with oil and gas exploration and production remains a significant issue in developing nations such as Nigeria. In numerous instances, the EIA has not been effective due to several factors as noted in the preceding chapters. The findings of this study indicate that Nigeria is under immense pressure from MDAs to implement a strategic approach to impact assessment and decision-making in the oil and gas sector.

In other words, there has been an increasing demand for SEA implementation as a prerequisite for securing funding for oil and gas development projects by MDAs. This trend indicates a gradual transformation in the environmental safeguarding policies of these agencies, moving from a strict requirement that EIA should be undertaken for major oil and gas development projects in Nigeria to advocating for the establishment of SEA procedures.

Given Nigeria's heavy dependence on the petro-dollar economy and with accelerated government attention to expand oil and gas development into new frontier basin fields that possess significant hydrocarbon resource potential, it is fair to conclude that it is a matter of time before Nigeria succumbs to the mounting demands for SEA implementation by the MDAs as a pre-condition for funding oil and gas development. However, participants expressed concerns regarding the adoption of SEA principles and guidelines formulated by international financial institutions, particularly those from developed nations, as these may not adequately reflect the unique local context of Nigeria. Nonetheless, it is evident from the findings of this study that the potential impetus for transitioning to a more strategic approach to planning and impact assessment in Nigeria's oil and gas policy sector may not stem solely from environmental considerations; instead, exogenous pressure related to macroeconomic conditions, particularly the looming threat of divestment from MDAs.

The results of this study corroborate the observations put forth by Tshibangu and Montaño (2016) as well as Loayza (2012), which highlighted that the threat of divestment in key strategic sectors, particularly the energy industry could be a primary factor in countries within the Global South to embrace a more strategic approach to safeguard environmental quality and contribute to environmental governance. Transition theory and concepts note that major disruption or changes in market conditions and or economic forces can be a game-changer by putting pressure on an established governance regime to initiate a transition from unsustainable to sustainable decision-making cultures to help drive the decision process towards more sustainable outcomes (Geels et al., 2017; Loorbach et al., 2017).

9.3.2 Exogenous factor two: climate change concern

In parallel with the motivative discussed above, the prospect for transitioning from making decisions about oil and gas development based on a project-by-project basis through EIA to a more strategic form of planning and assessment in Nigeria's oil and gas industry is also being influenced by the concerns related to climate change. Climate change and increasing global warming have been extensively linked to a range of anthropogenic activities (Halttunen et al., 2022), and one of the leading causes is the burning of fossil fuels by the oil and gas industry (Bach, 2019; Boon, 2019). Gas flaring, in particular, is the most significant source of greenhouse gas emissions, which not only exacerbates the warming of the planet and alters climatic conditions but also inflicts detrimental health and environmental effects on the local populations in Nigeria's Niger Delta region (Edwin and Ugbomeh, 2017; James et al., 2023). The EIA is often perceived as a decision-support instrument that can enable the regulatory authorities in the petroleum industry to prepare for climate change adaptation and mitigation measures. However, the findings of this study suggest that planning for oil and gas exploration and development vis-à-vis climate change considerations has not been adequately addressed in the current EIA regime. The existing EIA regime falls short in two critical aspects: first, the assessment of climate change impacts is confined to the emissions of individual projects within a specific spatio-temporal context. Second, the cumulative effects stemming from multiple projects at the regional scale are insufficiently examined within the framework of the EIA process.

As a signatory to international agreements such as the United Nations Framework Convention on Climate Change (UNFCCC), Kyoto Protocol and Paris Agreement (COP-21), Nigeria has made an international commitment to promote sustainable natural resources governance in order to meet its obligations to UNFCCC, including curbing greenhouse gas emissions (GHG). As such, Nigeria is under increasing pressure to demonstrate how it would contribute to reducing greenhouse gas emissions and achieving Paris Agreement goals. Caught between the ever-increasing need to expand its energy frontier to meet domestic economic growth on the one hand and then, on the other hand, to account for its international commitments to reduce GHG, the findings from this research revealed that striking a balance between these two extreme situations may

likely influence the prospects of adopting a more strategic thinking approach to planning and assessment in Nigeria's oil and gas policy sector. As noted by one research participant:

“of course, there are issues of combating climate change, global warming and other negative effects associated with hydrocarbon extraction. Moreover, accessing affordable energy is key to the global economy, particularly as renewable energy costs are still beyond the reach of the ordinary. The best option for Nigeria is to adopt more robust environmental measures like SEA to enable policymakers in Nigeria to develop adaptation measures for oil and gas development initiatives at the policy, plan and programme level.”

The excerpts above exemplify how the urgency stemming from concerns about climate change could potentially promote the need for alternative and innovative environmental assessment processes, such as SEA in Nigeria's oil and gas industry. The results of this study resonate with the viewpoint expressed by Brooke et al. (2019), which posits that governmental initiatives aimed at meeting international commitments can serve as a powerful impetus for the adoption of more progressive environmental policy instruments. This perspective aligns with the principles of transition theory, which suggests that significant exogenous emergent factors or conditions beyond the control of the incumbent regime or governance can trigger transitions toward a sustainability pathway (Loorbach et al., 2017; Geels et al., 2002).

9.3.3 Exogenous factor three: sustainability considerations

The practitioners' questionnaire survey and qualitative interviews revealed that sustainability is an important motive that is likely to drive the transition towards SEA approach to planning and impact assessment in Nigeria's oil and gas sector. The prevailing sentiment among the research participants is that sustainability has emerged as a critical global concern, accompanied by an increased awareness that the consideration of environmental issues is now central to the development of oil and gas policies, plans and programmes and the activities of the energy industry, whether in the search for more sustainable forms of energy or in the expectation of improved environmental protection and management by the key actors in the energy industry. The acknowledgement of sustainability as a potential catalyst reflects a collective

understanding that traditional project-focused EIA is inadequate in addressing the broader and long-term consequences of oil and gas exploration and development. Given Nigeria's growing involvement in international climate change initiatives and environmental stewardship agreements, there is increasing pressure from environmental advocacy groups and multilateral development agencies to ensure that the country's economic growth—driven by the extraction of natural resources such as crude oil and natural gas—does not occur at the expense of environmental sustainability. This growing agitation highlights the need for adopting environmental policy tool like SEA to help address the environmental implications of oil and gas development at the strategic tier of policies and plans where the goal of environmental protection could be protectively mainstreamed into overall energy frameworks at a much earlier stage of conception (See section 8.5.2). The results are consistent with the research conducted by Tshibangu and Montaña (2016), Loayza (2012) and Lamorgese et al. (2015), which indicates that the consideration of sustainability is crucial in the incorporation of strategic EA in the energy development assessment and decision-making.

9.3.4 Endogenous factor four: learning potential through EIA practice

Unlike the exogenous pressures referenced above, which can be seen emerging from outside of the regime, endogenous conditions related to the learning potential derived from existing EIA practice in the old frontier of oil and gas exploration and development in the Niger Delta region could also increase the value acceptability SEA (See section 8.5.4). The results revealed that when reflections upon the oil and gas EIA-related process and the consequences of practical measures and decisions made to improve environmental decision-making, sustainable development, and environmental protection occur, it may likely bring to the fore the inability of EIAs to balance the trade-offs between hydrocarbon extraction and environmental protection in the Niger Delta region. Such a learning outcome will likely reinforce the argument that continual reliance on a project-centric EIA regulatory approach with the potential outcome of a business-as-usual scenario, i.e. assessing mainly project impacts akin to the current practice in the Niger Delta region, may likely imperil the prospect of achieving sustainable oil and gas development in the new frontiers. These findings corroborate the assertion advanced by Nilsson and Persson (2017) that lessons learned from prevailing environmental practice

can be used to pursue integrated policy-making instrument such as SEA to drive the decision process toward sustainability.

However, as discussed in Chapters Six, Seven and Eight, the compartmentalised nature of public participation in the current EIA-related process in the oil sector will likely present significant challenges to achieving effective and meaningful learning outcomes. Gazzola et al. (2011) and Sanchez and Morrison-Saunders (2011) noted that learning occurs in EIA systems when the decision-makers or regulators and other relevant stakeholders work together and share information about the assessment process and accepted strategies to mitigate impacts and identify opportunities to promote the environment in decision-making, including where EIA appear to be deficient. Hence, it is fair to argue that the efficacy of the EIA is constrained by its limited capacity to incorporate the relevant actors to take part in a social learning process in order to reflect on the assessment process and the outcome, which may lead to knowledge regarding what works best in the prevailing EIA practice as well as its constraints. Nevertheless, despite the compartmentalised nature of the participatory process in the prevailing oil and gas EIA regime, the result of the study indicates that the potential for learning from the prevailing EIA practice in the Niger region constitutes a key important variable associated with the opportunity and need for a transition from project-level assessment to a strategic-level approach in Nigeria's oil and gas environmental management practice.

9.4 Niche

From the various accounts provided, the results of the study revealed that the recent introduction of PIA in Nigeria, which outlines an ambitious plan to expand oil and gas development into new frontier basin fields that possess significant hydrocarbon resource potential, offers a niche opportunity to facilitate a transition toward SEA. Participants in the study emphasize the imperative of leveraging the policy window provided by PIA to help draw the attention of the decision-makers about the current management response to the risk posed by oil and gas activities in the Niger Delta region through EIA practice has not been generally effective in preventing adverse environmental impacts and the need for SEA to plan oil and gas planning and

development in the new frontiers before such a decision window is foreclosed. These insights further indicate that the potential for SEA adoption in Nigeria is still in a niche stage, requiring a protected space to thrive. The transition theory posits that niche actors that promote novelty that seek to challenge the accepted norm or standard will require protected spaces, akin to research and development laboratories to flourish (Geels, 2002). Drawing on Strategic Niche Management (SNM) principles, the notion of protected spaces can be used here to illustrate the reciprocal relationship between the emergence of a policy window and the potential for transformative change. According to SNM, protected spaces encompass three fundamental components: shielding, nurturing and empowering (Smith and Raven, 2012). Shielding is described as safeguarding emerging innovations from the prevailing selection pressures of the existing regime. Once an innovative idea has been shielded in the protective environment, it is nurtured through various supportive mechanisms. Ultimately, the niche is empowered to confront the barriers or challenges posed by the regime in a competitive manner (Smith and Raven, 2012).

In Nigeria, the findings from this study revealed a notable lack of recognition among key regime actors, such as government regulators and oil companies regarding the need to advance the environmental assessment process beyond the traditional EIA. It has become evident that the regulators and oil companies have established a core alliance at the regime level, which appears to resist the adoption of SEA. Consequently, even in instances where advocacy from niche actors appears to exert pressure for change at the regime level, the entrenched alliance between regulators and oil companies tends to suppress and obstruct any fundamental transformation within the oil and gas environmental regime, which remains predominantly anchored in EIA practice. This resistance and scepticism towards transitioning to a strategic-level approach can be attributed to the prevailing environmental decision-making being locked in path-dependent practice. Such opposition is not limited to the implementation of SEA; rather, it reflects a broader reluctance to embrace policy changes or initiatives that could disrupt established decision-making practices. In the context of Nigeria, economic and political prioritization and stability of the incumbent environmental governance, which is largely seen as enabling the oil companies to evade environmental accountability, constitute key

factors that informed such resistance. This situation is further complicated by the lobbying efforts of oil companies aimed at persuading regulators to uphold the current EIA-centric status quo. Ultimately, the regime is characterized by a complex interplay of competing economic, political and lobbying interests, which are likely to slow the diffusion of the SEA novelty from the niche level into the regime.

In view of the foregoing, a fundamental question arises, particularly in terms of the potential factors to be considered for promoting SEA development at the niche level in light of the resistance posed by key regime actors, which may hinder the creation of a conducive environment for SEA's advancement. This question is particularly relevant when considering the entrenched regime within which the SEA concept is expected to grow and eventually become fully integrated into Nigeria's oil and gas sector. The findings of the study indicate that robust stakeholder engagement, collaboration, and negotiation are critical elements for the successful adoption of SEA within the oil and gas sector. This aligns with transition theory, which emphasizes the necessity of establishing a platform that incorporates both niche and regime actors to facilitate a transition towards sustainability (Geels and Schot, 2007). Thus, in order for the SEA idea to be effectively diffused in Nigeria, there is a need for network alignment and collaboration between the niche and regime actors. The relationship and collaboration at the niche and regime level would likely result in a learning process that could help identify and overcome innovation bottlenecks related to organizational challenges (Geels and Schot, 2007; Kemp et al., 2007; Smith, 2007; Geels, 2008). Hence, the learning process through effective networking that fosters the exchange of information and knowledge between the regime and niche actors and other relevant stakeholders can be argued to represent the best ways of facilitating the transition toward SEA. Therefore, it is evident from the foregoing that sufficient advocacy for the adoption of SEA within the regime by the regime actors' innovation will inevitably require networks championing, engagement and collaboration with the niche actors in the transition management process to promote continuous learning by doing and doing by learning among the diverse actors.

In conclusion, the establishment of supportive policies and legislation at the regime level, coupled with robust political backing, is critical to ensuring the successful implementation of SEA in Nigeria's oil and gas sector. These measures will provide the

necessary framework and institutional support to facilitate the transition to the SEA regulatory process to inform the preparation of energy development strategy and environmental management framework for the emerging regions and in doing so, identify strategies and priorities for future management and development while enhancing the efficacy of traditional project-level EIA.

9.5 Barriers to strategic transition

This section discusses the potential barriers that could constrain mainstreaming a more strategic thinking approach to planning and assessment in Nigeria's oil and gas policy sector.

9.5.1 Lack of SEA awareness and its added value

The results revealed noteworthy insights: although the research participants exhibited a moderate awareness of SEA, this knowledge is generally superficial—limited to basic recognition of the SEA concept. The limited awareness of SEA may be attributed to the absence of formal or informal requirements in Nigeria and a lack of practical experience in engaging with the process. This observation is further corroborated by the interview findings, where over half of the participants acknowledged familiarity with the SEA concept but reported no involvement in its practice. This limited knowledge of SEA and its practical implementation hinders the grasp of strategic thinking and its potential benefits in oil and gas planning and development, posing a significant barrier to the effective integration of SEA. Consequently, it is not surprising that some participants find it challenging to grasp the potential benefits in the context of oil and gas planning and development. This implies that the lack of in-depth knowledge of SEA within the broader oil and gas context could significantly hinder a successful integration of a strategic approach in Nigeria's oil and gas sector.

However, it is imperative to note that the extensive EIA experience in Nigeria's oil and gas sector could also serve as a valuable asset for laying a solid foundation for effectively adopting a SEA process in the energy development assessments and decision-making. Nevertheless, the findings of this study highlight that the extent to which a strategic approach is effectively integrated and operationalized is significantly dependent on the

level of proficiency and efficiency in the technical knowledge related explicitly to SEA processes. While EIA experience may provide a critical base, it does not inherently guarantee the nuanced understanding and adept application of the distinct methodologies and considerations intrinsic to SEA. The absence of such technical knowledge could constrain the successful mainstreaming of a strategic approach to planning and impact assessment in Nigeria's oil and gas sector. This aligns with Fischer's (2002) assertion that insufficient awareness of SEA may pose a significant obstacle to the effective integration of a strategic approach in national or sectoral planning and development, including its implementation.

9.5.2 Political barrier

The findings indicate that political factor may potentially constitute a major barrier to mainstreaming a more strategic approach to planning and assessment in Nigeria's oil and gas sector. Research participants expressed a shared belief that introducing a strategic approach into an entrenched environmental management regime would likely encounter resistance, particularly from political actors. This resistance may stem from a perceived apprehension or fear that embracing a new environmental assessment procedure at the policy level may pose a threat to established path-dependencies that politicians often rely on to make decisions that seem to favour their interests. It was found that reluctance by the decision-makers to disclose crucial information on how environmental decisions related to oil and gas development are made at the strategic PPP-making level may add another layer to the resistance toward SEA integration. This is largely because the policy-makers may be averse to sharing such information, especially when SEA requirements are perceived as conflicting with economic development goals. This aversion is rooted in the concern that transparency might impede their ability to prioritize political and economic considerations over environmental concerns.

These findings are consistent with the observations made by Gibson (2002) and Turnpenny et al. (2008), who noted that in many jurisdictions where SEA has been institutionalized, decision-makers frequently express concerns that SEA may limit their political choices. This apprehension is often rooted in a limited or incomplete understanding of the actual purpose of SEA. Rather than viewing SEA as a tool to inform

and enhance decision-making, policymakers may perceive it as a restrictive mechanism that could hinder their ability to prioritize political or economic objectives. The lack of clarity around SEA's role can contribute to resistance, as decision-makers may fear that the transparency and long-term planning required by SEA could challenge established practices, reduce their flexibility, or expose politically sensitive decisions to greater scrutiny. This highlights the importance of educating stakeholders, particularly at the policy level, about the strategic benefits of SEA—such as its potential to integrate environmental, social, and economic considerations into decision-making processes, ultimately leading to more sustainable and balanced outcomes. Nevertheless, the successful mainstreaming of a more strategic approach to planning and assessment in Nigeria's oil and gas policy sector will likely depend on solid political buy-in and support because such political commitment creates an environment for substantive actions and may provide incentives for effective SEA operations.

9.5.3 Institutional and governance barrier

The results of this study indicate that the existing EIA institutional and governance regime for environmental protection and management decisions in Nigeria is characterised by a rigid regulatory approach, poor coordination, value conflicts, disparate objectives, politics and power dynamics. The lack of cross-departmental collaboration and coordination to address environmental and sustainability issues arising from hydrocarbon development in the Niger Delta is particularly challenging. One participant noted that the Department of Petroleum Resources, a key government agency tasked with managing environmental concerns related to petroleum pollution, often exhibits a lackadaisical and passive response to recommendations from the Federal Ministry of Environment regarding collaborative efforts to tackle these environmental challenges. An intriguing possibility is that mainstreaming a strategic approach to planning and impact assessment in Nigeria's oil and gas sector will inevitably involve a wide range of actors and may transcend the roles and responsibilities of any single institutional and governance department and poor inter-agency engagement and cooperation between the relevant statutory bodies may significantly impede the successful goal of mainstreaming SEA. This observation aligns with the findings of Slunge and Tran (2014), who highlight that the main challenge in adopting a strategic approach

to planning and assessment is most pronounced at the institutional and governance levels, where the intricate interactions between formal and informal norms and conflicting values are prevalent. Therefore, substantial reforms and modifications to the current EIA institutional and governance framework are essential to facilitate a strategic shift in Nigeria's oil and gas policy landscape.

In a nutshell, the ways in which the existing EIA regime will likely play a key role in the outcomes and pace of a transition toward a strategic form of planning and assessment in the oil and gas policy sector. Transition management theory literature suggests that given the uncertainties and ambiguities in facilitating a transition, there is a need for a deliberative governance regime with clarity in the roles and responsibilities that embrace and generate diversity, inclusivity and reflexivity in order to shape the interactions between actors to drive the decision process towards more sustainable outcomes (Loorbach et al., 2015).

9.5.4 Legislative barrier

Besides the institutional and governance-related barrier, the findings in this study revealed the absence of a legislative framework for SEA in Nigeria as a potential barrier. Unlike the established EIA process, which operates within a legislatively sanctioned framework, Nigeria currently has no formal or voluntary requirements for strategic dimensions of environmental assessment in the national development policy initiatives. An essential factor in SEA integration into the policy planning process is the provision of explicit legal obligations or guidelines (Partidario, 1996; Fischer, 2002). The interview findings revealed that the absence of legislative guidance could create an unregulated space and uncertainty in mainstreaming a strategic thinking approach to planning and assessment in the petroleum industry. The study underscores that effective uptake of a strategic thinking approach to planning and assessment is often difficult to embrace and establish due to a lack of legal foundation to guide the relevant actors that would be involved in SEA and PPP processes in a consistent and coherent manner.

Indeed, it can be argued that addressing the named barriers in the preceding section alone without formal legal requirements does not necessarily guarantee better SEA

integration. Sheate et al. (2001) note that a lack of a legal framework may often result in considerable difficulties for decision-makers and practitioners in rationalising disparate SEA processes without an appropriate mechanism to ensure a consistent commitment to the decision-making process. As such, SEA adopted and practised without the detailed statutory framework outlining specific criteria, guidelines, and obligations is barely effective, particularly when the decision-making process is highly susceptible to political interference. The absence of explicit legal provisions can render SEA "toothless and highly sensitive to political struggles and power games," as noted by Fischer (2005, p.414).

In light of the foregoing, it is fair to note that in a non-regulated context, SEA may legitimise non-transparent and non-accountable decision-making exercises, presenting a risk to the credibility of the assessment process. This can explain, to a large degree, why formal legislation is significant when exploring the potential to mainstream SEA into policy and planning formulation. Reinforcing this notion, Sheate et al. (2001, p. 85) affirmed that most "successful SEA generally occurs where there is a legal obligation to require it." Hence, the legal foundation to undertake an SEA process is considered one of the contextual imperatives since the framework can promote the feasibility of its applications and practice. Though it is worth noting that SEA can still operate less formally and may not necessarily require new formal legislation (Morrison-Saunders and Pope, 2013; Joao and McLauchlan, 2014), rather, an existing EIA provision can provide a potential platform for its adoption (Fischer, 2002). Nonetheless, this research acknowledges that the absence of a legislative framework has the potential to undermine the quest for mainstreaming a strategic thinking approach to planning and assessment in Nigeria's oil and gas policy sector.

9.5.5 Barrier-related to actor and stakeholder relations

The study findings revealed that a lack of stakeholder consultation and engagement within the environmental governance regime responsible for oil and gas environmental planning and management could be a potential barrier to transitioning toward a strategic thinking process in Nigeria. Given the power constellation within the EIA institutional regime in Nigeria's oil and gas industry, the relationship between regulatory actors

overseeing the EIA administration has often resulted in a tug-of-war or a battle of opposing sides. This has also contributed to the passive and shallow attitude to public participation in the oil and gas EIAs, with regulatory actors and industry players wielding disproportionate power in influencing policy-planning and decision-making processes to the detriment of local communities and environmental interest groups. The community survey findings showed that the local inhabitants within the oil-producing areas were not sufficiently involved in the oil and gas environmental decision-making process. Therefore, the absence of robust stakeholder engagement within the petroleum sector will likely hinder the prospects of a transition toward a more strategic approach in Nigeria's oil and gas policy sector. Transitioning from the dominant culture of project-based EIA to a more strategic thinking approach intended for Nigeria's oil and gas policy sector will require the support of the relevant stakeholders since such a transition will likely create winners and losers.

9.6 The need for a transition-based EIA framework

As attention turns to opening new frontiers to potential oil and gas drilling activities in Nigeria, the need for a more strategic approach to plan for hydrocarbon development transitions is of increased importance. SEA has the potential to address the environmental impacts of oil and gas development initiatives early in the planning process before critical decisions and commitments gain momentum, and project proposals become a reality at the strategic tier of policies, plans and programmes formulation (Noble et al., 2013; Fidler and Noble, 2012). In this way, SEA can ensure that oil and gas development decisions are made within a broader environmental planning and management framework to achieve a sustainable outcome. Currently, there is a growing transition toward SEA as part of the policy-planning and regulatory process to inform decisions about opening new energy resources frontiers to potential oil and gas drilling activities (Doelle et al., 2013; Caddell, 2016; Kapoor et al., 2021) and largely due to the traditional project-level EIA is unable to influence decision-making at the policies, plans and programmes tiers above it (Prideaux and Prideaux, 2016).

The EIA is a reactive environmental assessment tool and often comes into the planning process too late to significantly influence the outcome of hydrocarbon development

commitments and proposals that have already gained momentum at the level of policies, plans and programmes, effectively invalidating other important options. Additionally, the EIA's focus on mitigating the individual energy project development limits its ability to address the cumulative environmental impacts of multiple individual projects of the same type that are co-located in a region, regional-scale resource management concerns and broader policy issues that are of interest to relevant stakeholders (Fidler and Noble, 2012; Lamorgese et al., 2015; Anifowose et al., 2016). In cases where EIA is undertaken for oil and gas project development, there is often a lack of carefully thought-out and long-term consideration for environmental and sustainability issues associated with hydrocarbon development infrastructure that may be of regional and cumulatively detrimental to the ecological environment beyond the specific development field (Elvin and Frase, 2012). Similar observations have been noted in relation to other economic sectors with significant impacts on both the natural and human environments, such as urban development and transportation (Thérivel et al., 1992; Monteiro and Partidário, 2017).

The limitations of the project-based EIA approach to planning for and assessing the impacts of oil and gas extraction and development have been instrumental to the growing transition toward SEA systems in the context of international oil and gas development (Fidler and Noble, 2012; Lamorgese et al., 2015). Scholars such as Doelle et al. (2013), Fidler and Noble (2012), Vilardo et al. (2020), Fidler and Noble (2013) and Kapoor et al. (2021) have highlighted the growing adoption and application of SEA as part of policy-planning and regulatory process in several jurisdictions, particularly in the developed countries such as Canada, Denmark, UK, US, Norway and Australia to inform long-term strategic decisions about opening new frontiers to potential hydrocarbon extraction and development. In these contexts, these scholars further assert that the use of the SEA process enabled the preparation of oil and natural gas development strategies and environmental management framework for the energy resource frontiers and, in doing so, identified strategies and priorities for future management and development while strengthening and addressing the limitations of the traditional project-level EIA. However, as the transition to and use of the SEA process in the context of oil and gas planning and development grows, decisions about hydrocarbon development and

management of the environmental consequences associated with such development are still predominantly approached on a project-by-project basis in several countries rich in hydrocarbon resources potential in comparison to SEA. This is the case in Nigeria, where there is no system of SEA for oil and gas planning, exploration and development. Considering that major oil and natural gas development is looming in Nigeria's new frontier basin regions, there remains the need and opportunity to advance SEA in the planning and assessment of hydrocarbon development initiatives at the strategic tier of PPP before making decisions about individual project proposals.

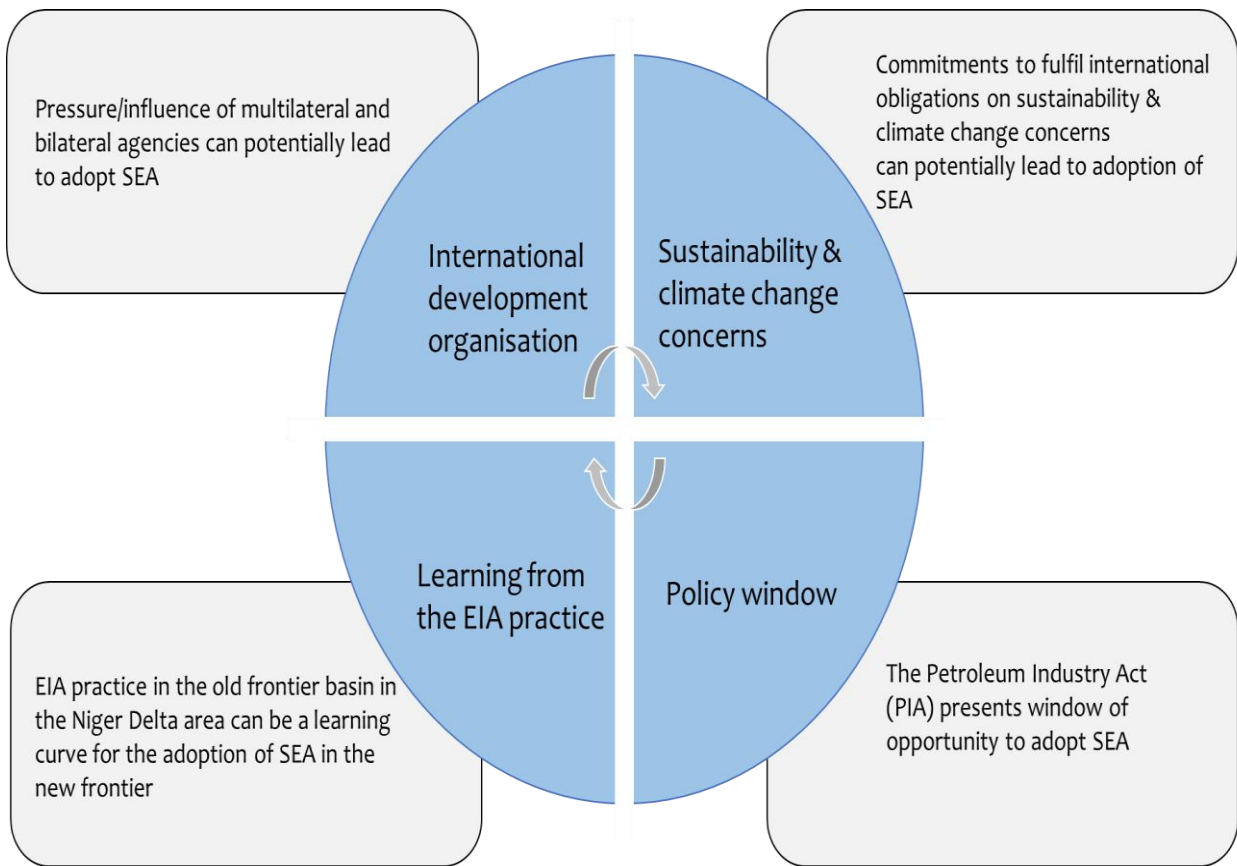
Although there has been a wide range of scholarship literature on the perceived and proven benefits of SEA in various economic sectors internationally (Slunge and Tran, 2014; Monteiro and Partidario, 2017; Slunge and Loayza, 2012; Ahmed and Sanchez-Triana, 2008; Geißler et al., 2021) and in particular, the energy industry (Vilardo et al., 2020; Noble et al., 2013; Marshall and Fischer, 2006; Lamorgese et al., 2015; Noble, 2002; Noble, 2008; Horvath and Barnes, 2004; Esterhuyse, 2018; Noble et al., 2013; Doelle et al., 2013; Kapoor et al., 2021), there has been no research that has developed a transition-based framework to fathom the complexity of the current EIA regime and of a potential transition to a strategic approach to impact assessment and decision-making in a clear and comprehensible way. This conceptual drawback in the scholarship literature necessitates the development of a framework to illustrate the dynamics and complexities of how a transition from the prevailing project-level assessment practice to a strategic approach could come about through the interaction processes within and between three analytical levels: landscape, regime and niche in environmental management regime.

The framework is developed using key variables and themes identified from the quantitative and qualitative findings of this study. The framework highlights the potential critical decision factors that could facilitate a transition toward a strategic approach in Nigeria's oil and gas development assessment and decision-making (See Figure 9.1). As detailed in Chapter Nine, the potential transition from the current well-established and resilient EIA practice towards SEA in oil and gas planning and development depends on the identification of critical decision factors or transition drivers. As highlighted in Figure 9.1, these potential CDFs may have a diffused impact on

transforming the prevailing EIA practice to a strategic approach in the oil and gas policy sector.

Furthermore, the framework underscores the importance of identifying and capitalizing on a key policy window within Nigeria's petroleum sector to drive the transition towards a more strategic approach. A policy window represents a pivotal phase or period in the decision-making process where SEA might be considered for inclusion in the preparation of national or sectoral development agenda (Dalkmann et al., 2004). A policy window identified in this study is the Petroleum Industry Act, which sets forth an ambitious agenda to expand oil and gas exploration into the new frontier basins with considerable hydrocarbon potential in Nigeria. Embedded in the PIA is the imperative for a more sustainable approach to oil and natural gas exploration and development in the new frontiers. Accordingly, research participants acknowledged that the decision window or window of opportunity provided by the PIA may likely reinforce a transformative change in the essence and nature of the environmental protection and management regime in Nigeria's oil and gas industry. This, in turn, could lead to a shift from the prevailing EIA-related processes to adopting SEA to allow decision-makers to plan for oil and gas exploration and development in the new frontiers and environmental management framework for the regions to achieve sustainable development. Figure 9.1 highlights the potential transition drivers that could facilitate the transition toward SEA.

Figure 9.1: Potential transition drivers that could facilitate the transition toward SEA



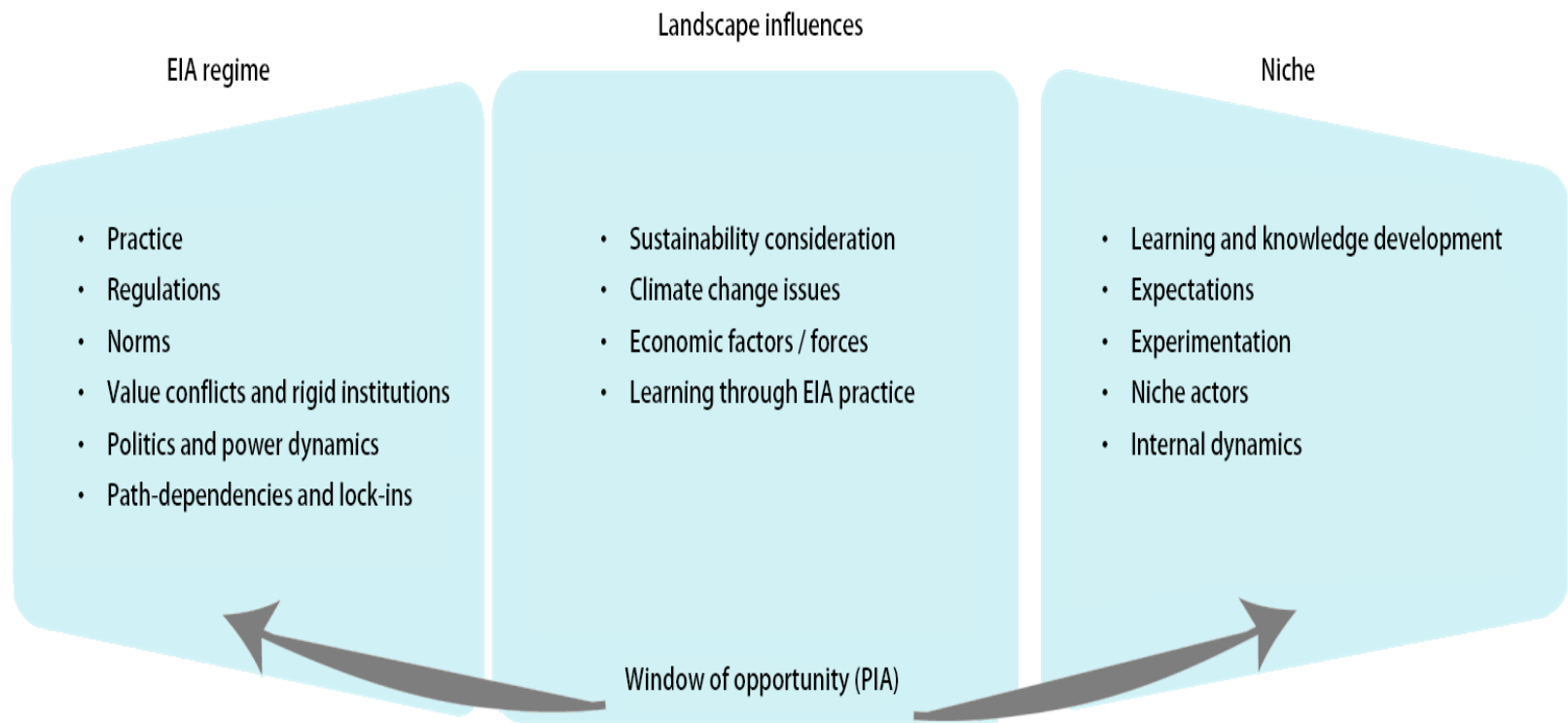
Sources: Author

9.6.1 Key consideration in the proposed transition-based EIA framework

This section outlines the key elements or building blocks of the transition framework grounded in the ontological principles of MLP of transition theory, which underpin this research. As discussed in Chapter Four, the MLP posits that transition, innovation or change does not occur or exist as a discrete entity but rather evolves and develops from a dialectic interplay of regime, landscape and niche—interacting within a nested hierarchy (Geels and Schot, 2007). Thus, exploring the prospects of transitioning from the current EIA system to a more strategic approach in Nigeria’s oil and gas environmental management regime means that the three key components of the MLP – landscape, regime and niche are particularly relevant in developing a transition framework in this study. As highlighted in Figure 9.2, these mutually dependent transition processes have been regarded as the key components of the framework and

have been grouped under the following categories: The EIA regime, which comprises actors, practices, norms, regulations, value conflict, institutions, politics and power dynamic and path-dependencies and lock-ins. The landscape influences include sustainability consideration, climate change concerns, learning potential from prevailing EIA practices, and increasing demands for SEA implementation as a pre-condition for funding oil and gas development by international development organisations. Finally, the niche is where experimentation and learning processes occur, potentially leading to significant change from predominantly relying on the existing EIA practice and complementing it with a more strategic form of impact assessment process in the oil and gas sector. Figure 9.2 illustrates the key components of the transition-based EIA framework.

Figure 9.2: The key components of the transition-based EIA framework



Source: Author generated

The proposed framework integrates three key components (see Figure 9.2) derived from the MLP concept. These components offer a comprehensive understanding of the nonlinear patterns and underlying dynamics that would drive the transition within the environmental management regime of the oil and gas industry. As discussed in the findings of the study, understanding the transition from the current project-based EIA approach to a more strategic assessment process in Nigeria's oil and gas sector requires identifying these critical components and their specific characteristics that underlie the proposed framework. Based on the quantitative and qualitative findings from this research, the researcher was able to develop a detailed integrated element of the transition model to illustrate that the transition toward a strategic approach evolves from a range of mutually dependent factors interacting within a nested hierarchy. The key components of the proposed framework were identified and thoroughly discussed in Chapters Eight and Nine, and the results highlight the iterative and interdependent processes of these elements. These processes are fundamental to transforming the existing EIA-based environmental management system into a more strategic form of planning and impact assessment in the oil and gas sector. The following section presents the proposed transition-based EIA to SEA for Nigeria's oil and gas sector.

9.6.2 The transitions-based EIA framework

The transition-based EIA framework presented below is grounded in the ontological principles of the MLP and is supported by empirical findings. The MLP adapted from Geels (2002) and applied to Nigeria's oil and gas environmental management regime provides an analytical framework for exploring the potential of a transition from project-level assessment to a strategic-level approach through the interplay of niche, regime and landscape dynamics. As illustrated in the framework, the EIA regime is characterised by norms, regulations and actors, all of which play a role in entrenching path-dependent EIA practice in oil and gas environmental decision-making (See Figure 9.3). In this current system, there are inefficiencies in environmental protection and management as the EIA process is largely reactive and constrained by the assessment of individual development projects and to project-by-project decision-making. It is anticipated that potential landscape factors could help destabilise the current EIA regime while targeting the policy

provided by the PIA so that the SEA idea can be diffused within the niche and become part of environmental management in Nigeria. This will involve continuous and deliberative efforts to seize the policy window to facilitate a shift in the environmental management practice toward SEA. Although the current path-dependent EIA practice, which has become locked within the regime may present some resistance, the transitions-based framework advances the potential for the learning process to occur through continuous loops of reflection and knowledge generation along the EIA-SEA spectrum. This learning process is expected to drive the transition toward SEA and, in turn, the outcomes of such a transition influencing decisions and actions within the existing EIA regime, ultimately contributing to transforming the aspects of both EIA and SEA.

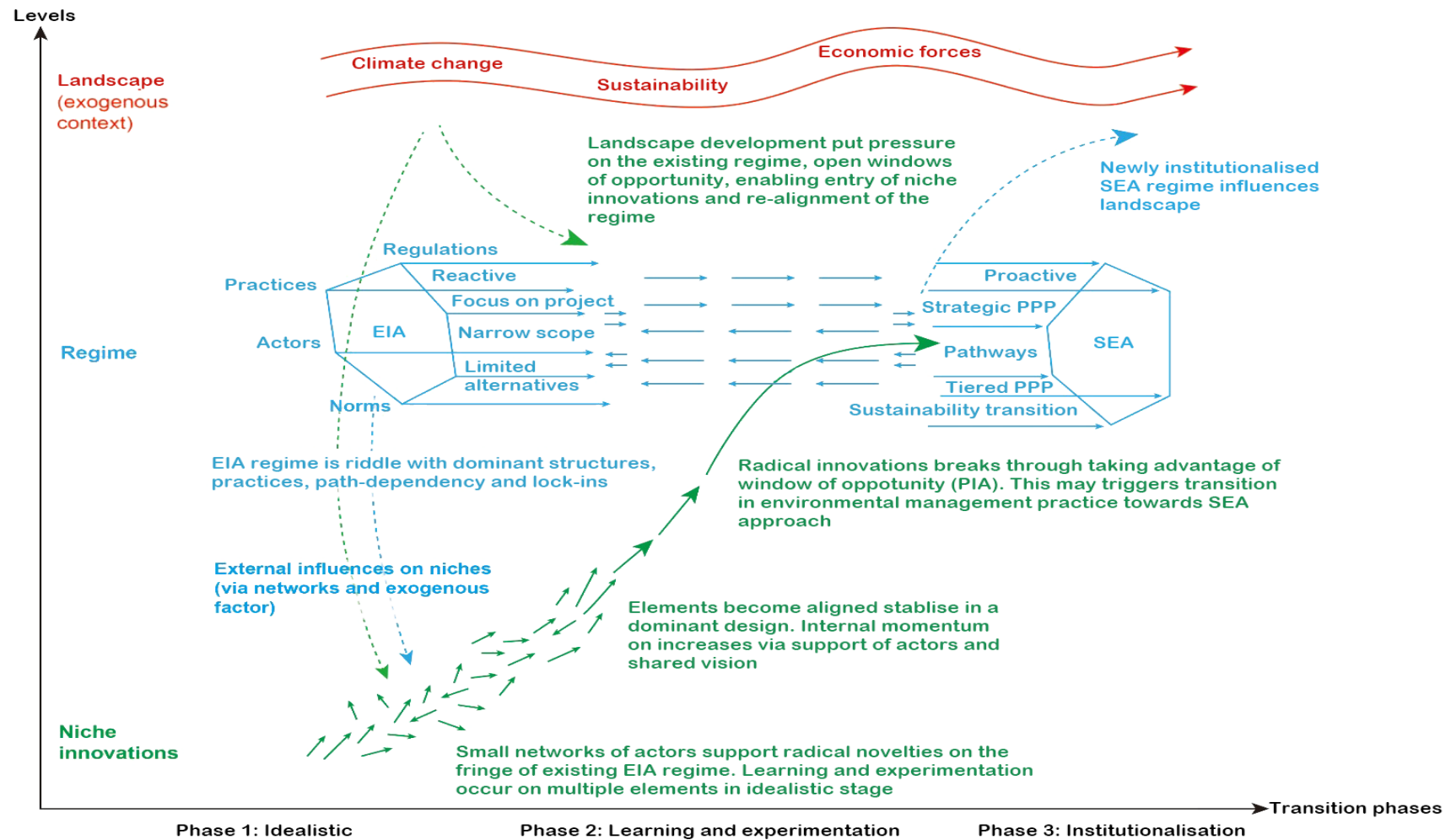
Traditionally, EIA has been reactive, focusing on assessing the environmental impacts of individual oil and gas projects. The framework advances a shift to SEA, which is more proactive. SEA can help integrate environmental considerations at the earliest stages of decision-making to shape oil and gas policies, plans, and programmes rather than react to the environmental effects of predetermined projects. Likewise, EIA tends to have a narrow scope, focusing primarily on the immediate environmental impacts of specific projects. In contrast, SEA offers a broader, more holistic approach that considers cumulative and regional environmental consequences. As a result, SEA can operationalise sustainability objectives in the oil and gas policy-planning and development assessment, moving beyond the short-term project-level considerations typical of EIA. This approach can influence regime actors, leading to a transition from a mitigation-centred model to one that prioritizes sustainability and preventive measures at a strategic level.

Furthermore, the prevailing EIA regime is often influenced by political and economic factors that lead to sub-optimal paths — paths that are inefficient and rationalized controversial predetermined decisions or actions at the expense of environmental integrity in the Niger Delta region. Overcoming these entrenched path-dependencies and lock-ins in the EIA regime in Nigeria is crucial for guiding the oil and gas policy-planning and decision-making process towards more sustainable outcomes, particularly in the

new frontier basin region where energy development is looming. The transformative potential of SEA can provide an entry point for unlocking persistent path-dependent trajectories and lock-ins within the current environmental management regime in Nigeria's oil and gas industry. Unlike the EIA practice, which operates at the project assessment level, creating space for decisions to follow a predetermined path, SEA is a forward-looking tool that can anticipate and address path-dependent trajectories from the strategic PPPs to downstream decisions and actions before they become entrenched. When implemented early in the policy-planning and decision-making process for energy resource regions without a dominant decision trajectory or path (Noble and Nwanekezie, 2017; Noble et al., 2019), SEA can articulate a spectrum of future pathways for sustainable oil and gas development in Nigeria's new frontier basin regions before political and or economic opinions get entrenched. In this way, SEA can help broaden the scope of pluralism in environmental consideration based on long-term and strategic contexts to drive decision processes toward a more sustainable outcome, which cannot be effectively achieved under the current EIA practice. Therefore, the potential to change or alter the dominant path-dependencies and lock-ins of the current environmental management practice based on the EIA regime in Nigeria is significantly greater in scope through SEA due to its capacity to upscale environmental issues in regulatory decisions on opening new frontiers to potential hydrocarbon exploration and development early in the planning process before the manifestation of political and economic path-dependent trajectories that leads to lock-ins.

The transition-based framework conceptualizes the prospects of a transition from the EIA to SEA in Nigeria's oil and gas sector as a multi-dimensional interplay of landscape, regime and niche interacting within a nested hierarchy (Verbong and Geels, 2007). A detailed discussion of the main characteristics of these levels are presented in the subsequent sections (See Figure 9.3), followed by a discussion of the practice-based challenges associated with environmental assessment and the potential opportunities for mainstreaming SEA within the context of oil and gas planning and development.

Figure 9.3: Transition-based EIA framework



Source: Author generated based on the Geels (2002)

9.6.2.1 The EIA regime

Although the principles of EIA have been applied in Nigeria's petroleum industry since 1969 (Ogunba, 2004), the formal EIA regime was established through decree No. 86 of 1992, which prescribed the EIA requirement as the first major step in developing anticipatory environmental management measures to ensure the minimisation, prevention or avoidance of the potential negative consequences of proposed oil and gas project development on the environment (FRN, 1992; Anifowose et al., 1992). Unsurprisingly, the management response to the environmental challenges posed by oil and gas exploration and development has become path-dependent through EIA practice and based on the environmental improvement of individual project development. This may help explain why the environmental protection and management regime has become locked-in in EIA practice. Hence, although alternative environmental policy instruments such as SEA are available, the normative perception, culture, assumption, habit and belief rooted in the prevailing EIA practice have evolved and become more and more interconnected, resulting in this particular practice taking hold in Nigeria's oil and gas sector. However, the results of this study revealed that in the absence of SEA and with a much streamlined EIA, many of the incremental environmental effects of oil and gas exploration and development in Nigeria will still continue to go unchecked. Therefore, as attention turns to opening new frontiers to potential oil and gas exploration and development, the need for SEA to help inform the preparation of hydrocarbon development strategy and environmental management framework for the emerging regions and, in doing so, identify strategies and priorities for future management and development while enhancing the efficacy of traditional project-level EIA is of increased importance in Nigeria.

Nevertheless, the results of this study revealed that EIA practice continues to be highly prioritized and implemented as an appropriate management response to the challenges posed by oil and gas activities in the Niger Delta even though the current project-level assessment seems to be increasingly perceived by niche actors such as representatives of MDAs and environmental advocacy groups as maladaptive in the environmental management regime in Nigeria. The key actors prioritising the current oil and gas EIA-

related process, as identified in the study, are federal government regulators and oil companies. These actors possess unparalleled power and influence, enabling them to maintain the status quo of the EIA practice in the oil and gas environmental management regime and appear to resist alternative or complementary environmental assessment processes such as SEA. This means that attempts by niche actors to promote the SEA process in the petroleum sector may likely be neutralised by the government regulators and oil companies — or, at best result in power constellations, conflicts and/or long-term negotiation processes.

Moreover, the strong relationship between regulators and oil companies is rooted in mutual interests and dependencies, which have established and sustained political and economic path-dependencies that correspond with their interests, often at the expense of sustainable environmental protection and management. To buttress this point, at one end of this spectrum, oil firms are driven by an insatiable demand to extract more hydrocarbons in Nigeria, including in new frontier regions that are beginning to hold a greater appeal. At the other end of the spectrum, the government is keen on generating revenue from the oil and gas industry to fuel economic growth. In this mutually beneficial relationship, the regulatory actors appear intent on preserving the existing environmental management framework—primarily centred around EIA—largely to cater to the interests of the oil companies, which in many cases enabled them to evade a much greater scope of environmental accountability in terms of regional and cumulative environmental impacts of their operations. As earlier noted, in the absence of SEA and with a much streamlined EIA, many of the incremental and synergistic environmental effects of oil and gas exploration and development will likely be overlooked in the energy development assessment and decision-making process. Under this regulatory capture, it appears the regulators in Nigeria's oil and gas environmental management regime protect instead of embracing SEA regulatory processes, which could help ensure that energy development assessment and decision-making decisions are set within a broader environmental planning and management framework. This observation aligns with Negro et al. (2012), who reported that alliances between government actors and energy firms in the Netherlands led to resistance from energy firms and a preference for gas-driven power plants over more sustainable alternatives.

The transition-based framework presented in the study illustrates that a strong alliance between key regime actors, such as the federal government regulators and oil companies appears to play a key role in maintaining the status quo of the project-level EIA in the oil and gas sector. The framework underscores that potential resistance to a transition toward SEA is likely to be most pronounced within the existing oil and gas EIA regime in Nigeria due to entrenched path-dependencies and lock-ins. The research findings agree with Geels' (2014) perspective that incumbent regime and industry actors often form core alliances to resist change or oppose the adoption of more sustainable practices. The MLP theory posits that the force of path-dependencies and lock-ins supplemented by a network of powerful actors within the prevailing system often pose barriers necessary for transitions to a more sustainable future (Markard et al., 2012; Geels, 2002). The literature on environmental management highlights the critical role of the institutions and governance context in which SEA is to be mainstreamed since they can determine the conditions in which the strategic EA process is conducted and, consequently, impact the overall success or failure of its integration into policy-planning and decision-making process (Meuleman, 2015; Nwanekezie et al., 2021). Overall, the prospect of transitioning toward SEA in Nigeria's oil and gas environmental management practice hinges on the current EIA regime, which can accelerate or slow down the pace of this transformative shift.

9.6.2.2 Landscape drivers/influences

At the landscape level, the transition-based framework shows potential landscape pressures that could trigger a major shift from project-level assessment to a strategic-level approach in Nigeria's oil and gas environmental management practice. These potential landscape pressures include sustainability considerations and climate change concerns (See sections 8.5.2 and 8.5.3). Climate change has garnered significant global attention, especially with the signing of the Paris Agreement in 2015 by 196 parties. This legally binding accord aims to limit global warming to well below 2 degrees Celsius, with an aspiration to keep it below 1.5 degrees Celsius compared to pre-industrial levels (United Nations, 2020). Achieving the goals of the Paris Agreement demands far-reaching economic and social transformations guided by the latest scientific knowledge.

The agreement marks a pivotal moment in multilateral efforts to combat climate change, as it is the first legally binding treaty to unite all nations in addressing climate change and adapting to its impacts (United Nations, 2020). Nigeria is a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol and has made an international commitment to promote sustainable development, including meeting its obligation to the UNFCCC and reducing carbon emissions. The findings revealed that Nigeria is increasingly under intense exogenous landscape pressure to implement environmentally friendly policies, and the need for SEA process in the oil and gas sector appears to be more appealing because of the now generally accepted overwhelming need for carbon reduction and other longer-term environmental concerns, such as air quality and biodiversity loss. This is consistent with the submission by Geels (2012) that landscape-level influences are emergent issues or events that could have a significant diffuse impact on the prevailing regimes that have become locked-in in deficient and unsustainable practices as these factors operate beyond the control of individual or collection of regime actors.

Furthermore, the transition-based framework illustrates macroeconomic trends as another key potential landscape pressure that could help trigger a transition toward SEA processes in the new frontier basin regions (See sections 8.5.1). It emerged that the threats of divestment in hydrocarbon exploration and development, particularly in the new frontiers by international financial/development organisations, may force policy shifts in environmental management in Nigeria. As part of this shift, the regime actors may be compelled to revisit the existing management response to the environmental challenges posed by oil and gas exploration and development, which has become locked-in in the EIA practice toward a more strategic-led approach. The findings of this study indicate that while sustainability and climate change issues are crucial, economic factors, particularly those related to investment flows, appear as the most significant transition drivers toward the SEA regulatory process in the oil and gas sector. There is a justification for this assertion by the research participants. First, there has been a growing demand for SEA requirements as a pre-condition for funding by the multilateral development agencies. Second, Nigeria views the renewed interest in oil and natural gas extraction in the new frontiers as a strategic move to complement the existing 93% of production concentrated in the Niger Delta region. Third, the government is actively seeking foreign

direct investment in the oil and gas sector to generate additional revenue for economic and social development. These interlinked factors expose the Nigerian government's vulnerability to economic or investment boycotts by key lenders and thus will likely accelerate the pace of a transition from project-level assessment to a strategic-level approach to help plan for oil and gas exploration and development in the new frontiers. The MLP of transition theory posits that the regime will likely succumb to major disruption at the landscape level, leading to niche innovations that may significantly deviate from existing unsustainable practices, mindsets or culture and potentially catalyse regime transformation toward more sustainable pathways (Avelino and Rotmans, 2009; Geels, 2011; Geels and Schot, 2007).

However, it is important to note that oil and gas activities in the Niger Delta have not been subjected to SEA requirements. This omission could be attributed to resistance from government regulators and oil companies, who have maintained the stability and status quo of the current EIA practice. Such resistance to landscape pressures could significantly slow the adoption and diffusion of SEA in Nigeria, highlighting the challenges of achieving a strategic shift in environmental management practice in the oil and gas sector.

9.6.2.3 Niche

The findings of this research indicate that the need and opportunity for a transition from the prevailing project-level assessment to a strategic approach is more important now than ever, given the recent enactment of the Petroleum Industry Act, which outlines an ambitious plan to expand oil and gas development into new frontier basin fields that possess significant hydrocarbon resource potential. Core to the proposed transition-based EIA framework is that a key decision window or moment such as PIA should be targeted as a niche opportunity to adopt SEA in Nigeria. The imperative for targeting the current decision window was reinforced by the growing disillusionment that the current EIA practice has not generally been effective in preventing adverse environmental impacts in the Niger Delta region and the increasing support from the niche actors, mostly from the MDAs and environmental advocacy groups for an improved energy development assessment and decision-making, particularly in the new frontiers, where

hydrocarbon development is on the horizon. Participants acknowledged that capitalising on the policy window provided by PIA would likely help draw the attention of the regime actors to the need and opportunity to facilitate a transition toward a strategic level in the petroleum industry before such a decision window is foreclosed. An intriguing possibility of the participants' views can be linked to the fact that if the niche ideas are not adequately developed, they will miss the opportunity to take advantage of the policy window, which may close in the future (Geels and Schot, 2007). The results show that few international environmental groups such as Friends of the Earth and MDAs are playing a crucial role in supporting the idea of SEA in Nigeria. These organisations took part in various initiatives either by lobbying for governmental action or by incentivising the local communities to agitate for a more sustainable environmental policy implementation. Therefore, it is expected that the actors in niches will put in a lot of work to uphold the imperative of utilising the niche opportunity and work on the articulation of the potential benefits of the SEA process in the oil and gas planning, regulation and development as opposed to the traditional EIA practice.

Furthermore, the urgency to seize the opportunity of the policy window further indicates that the idea of SEA, initiated by actors, is still in a niche stage, requiring a protective and enabling environment to enhance its development. The MLP of transition theory posits that niche actors that promote novelty that seek to depart from the accepted norm or standard will require protected spaces, such as R&D laboratories to thrive (Geels, 2002). Essentially, this means that the acceleration phase of niche development and its subsequent diffusion requires a collaborative relationship between niche and regime actors. Niche actors, who often lack political and administrative power, must secure support from the regime actors who hold complementary assets and exert significant influence in the policy arena to achieve a successful transition (Elzen et al., 2012; Geels et al., 2012; and Hoogma et al., 2002). In many developed countries, conditions exist that facilitate interaction between niche and regime actors, fostering innovative approaches to address persistent societal challenges (Geels and Schot, 2007; Geels, 2011). In contrast, this study found the absence of such interactions between niche and regime actors that could help nurture, develop and integrate SEA ideas as a part of the oil and gas environmental management regime in Nigeria (See sections 8.6.3 and 8.6.4). This has

further indicated the level of uncertainties related to the alignment of networks of actors required to advocate for the adoption of SEA given that there are no significant relationships between niche and regime actors. A key question then is how the niche can be protected and nurtured in Nigeria to promote the diffusion of the SEA process in oil and gas environmental management. It is pertinent to ask this question if one considers that the EIA regime actors, along with the institutional normative perception, culture, assumption, habit and belief are deeply characterised by the stability of the prevailing EIA system that is locked-in by mechanisms and path dependence.

Perhaps an important part of overcoming the current EIA path-dependence and lock-in in the environmental regime in the petroleum industry is to focus on building network alignment among the key actors. Two avenues of collaboration and network alignment can be taken into account– within the regime actors and externally with the niche actors. The key regime actors are the federal government regulators who are responsible for policy-making, strategic planning, operational, oversight or related decision-making processes concerning oil and gas development and environmental management in Nigeria. Other key stakeholders that could be part of the transition processes toward a more SEA approach should include oil companies, MDAs, state government actors, investors, and Environmental NGOs. This network formation can enable the niche actors to articulate the potential added-value of integrating SEA into oil and gas planning and development to the regime and other relevant stakeholders to stimulate the internal niche process within the regime to induce learning processes, thereby fostering the broader acceptance and successful adoption of SEA. In particular, the participation of the powerful regime actors and developers in the learning processes are expected to help convey legitimacy and resources to niche-innovations. Transition management literature posits that the shift towards sustainable practices is contingent upon the niche-level that fosters learning and experimentation to articulate the expectations relating to the idea at stake to become more precise and more broadly accepted (Geels and Schot, 2007; Smith, 2007; Kemp et al., 2007).

In sum, the success of the transition to an SEA process is directly linked to the depth of learning facilitated by broad interaction, engagement and collaboration among the

relevant stakeholders. The greater the commitment to promote the learning process, the stronger the prospects for sufficient advocacy at the regime level to enable transition toward SEA in Nigeria's oil and gas sector. However, it is important to state that the learning process embedded in the transition-based model proposed in this research does not end with the culmination of a shift toward SEA but rather is intended to occur through continuous loops of reflection and knowledge generation along the EIA-SEA spectrum. In other words, the learning process could impact the transition to SEA, and in turn, the outcomes of that transition could influence decisions and actions made within the existing EIA regime (See Figure 9.3 above).

9.7 Potentials of transition to SEA approach in Nigeria's oil and gas sector

There has been a growing dissatisfaction surrounding environmental protection and management in the prevailing EIA practice in Nigeria's old frontier of oil and gas exploration and development in the Niger Delta region. The research findings revealed that the current EIA that ought to promote environmental consideration in the decision-making process is seen as largely reactive and constrained to mitigating the impact of individual energy development projects (see section 8.2.4). This is principally because the project-based EIA is often implemented too late into the planning process to make significant differences in the outcome of energy development proposals, which have already gained momentum at the strategic level of decision-making. These limitations of the traditional EIA practice reinforce the need for a transition toward a strategic-led approach that can proactively guide energy development assessment and decision-making, particularly in the new energy frontiers where oil and natural gas development is looming rather than reacting to those development initiatives.

SEA is a proactive tool that can address the environmental implications of oil and gas development at the earliest possible stages of the planning process before critical decisions and commitments are taken and energy projects become a reality at the strategic tier of PPP formulation (Vilardo et al., 2020; Fidler and Noble, 2012). In principle, a transition toward a strategic thinking approach in Nigeria is intended to provide regulators with the needed information at the earliest appropriate stage of the policy-planning and decision-making process to better understand the risks and opportunities

of opening new frontiers to potential hydrocarbon exploration and development, including the type and thresholds of environmental mitigation protocols that will be attached to drilling and production license (Horvath and Barnes, 2004; Esterhuysen, 2018). In this way, SEA can help improve regulatory decisions by ensuring that the oil and gas development initiatives that would lead to adverse environmental consequences in the new frontier basin regions can be prevented upfront rather than reacting at the EIA stage by proposing mitigation for individual projects.

Assessment discourse surrounding full-scale cumulative consequences of oil and gas extraction activities on the total carrying capacity of the ecological environment has been largely omitted from existing project EIA practice in the Niger Delta region (See section 8.2.4). A transition to SEA process with the capacity to consider broader spatial scales than a project-specific EIA is essential to offset the weaknesses of cumulative impact outcomes. SEA of oil and gas can play a central role in establishing a strategic context in which the trends of environmental issues that may be of regional relevance and cumulatively significant can be addressed early in the planning process (Elvin and Fraser, 2012). It can outline, integrate, refine and mitigate regional-scale concerns related to ecologically sensitive areas, multi-sectoral ocean use and cumulative effects in advance of project-based environmental assessments (Doelle et al., 2013: p 104). In this sense, SEA can be a means to proactively and comprehensively account for cumulative environmental implications of oil and gas development and, in doing so, inform the preparation of long-term strategies to address sectoral social issues and regional-scale environmental and economic resource management concerns that are of interest to relevant stakeholders (Fidler, 2013; Lamorgese et al., 2015; Elvin and Fraser, 2012). In the same vein, SEA applied in a strategic context can help formulate and explore a spectrum of alternative strategic options for the new oil and gas frontiers, select preferred strategic options and then create an avenue for an EIA to examine the potential impacts of the chosen alternatives in greater detail. Exploring and comparing alternatives can help identify other sectoral development activities and ensure that future scenario-based assessments of the oil and gas resource regions are considered in the policy-planning and decision-making process. This strategic foresight has been reported in Norway, where SEA was used as an integrated planning and assessment process to account for not only

the environmental consequences of the hydrocarbon exploration and development in the designated frontiers but also for the fishing and shipping commercial activities, including future scenario-based alternative assessments in the event of future hydrocarbon discovery (Doelle et al., 2013).

SEA can achieve what the traditional EIA cannot, which is to address sustainability concerns during policies, plans and programmes making. The project-based EIA approach is limited in its ability to effectively integrate sustainability objectives into the development and assessment of oil and gas policies, plans and future initiatives. This is primarily due to the limited scope of project-specific evaluations and the reactive nature of project-level decisions. In contrast, SEA has the potential to incorporate and operationalise sustainability principles in oil and gas policy and planning processes (Lamorgese et al., 2015; Doelle et al., 2013). The typical purpose and focus of SEA is to enable decision-makers to incorporate critical environmental and social factors—such as Valued Ecosystem Components (VECs)—throughout the planning process to ensure sustainable energy development (Lamorgese et al., 2015). An effective SEA system can allow for sustainability objectives to be incorporated throughout the oil and gas planning process — from strategic decisions to downstream project-level assessment and actions, ensuring that energy development decisions align with broader sustainability goals (Fidler and Noble, 2012; Kapoor et al., 2021; Doelle et al., 2013). In their study of SEA of oil and gas in the Beaufort Sea area in Canada, Noble et al. (2013) found that the consideration of SEA early in the oil and gas policy-planning and decision-making process was instrumental in providing the context for downstream project-level assessment and decisions, enabling a better understanding of whether a project proposal is designed based on sustainability consideration and whether such project was compatible with the environmental condition of the designated frontier of hydrocarbon development.

Furthermore, this study revealed that the decisions about environmental decision-making in the prevailing EIA regime are often influenced by political and economic factors that lead to sub-optimal paths — paths that are inefficient and rationalized controversial predetermined decisions or actions at the expense of environmental integrity in the Niger Delta region (see section 8.2.2). Overcoming these entrenched

path-dependencies and lock-ins in the EIA regime in Nigeria is crucial for coordinated approaches to planning, carefully thought-out decision processes and long-term PPP designs to guide the oil and gas exploration and development in the new frontiers towards more sustainable outcomes. The transformative potential of SEA can provide an entry point for unlocking persistent path-dependent trajectories and lock-ins within the current environmental management regime in Nigeria's oil and gas industry. Unlike the EIA practice, which operates at the project assessment level, creating space for decisions to follow a predetermined path, SEA is a forward-looking tool that can anticipate and address path-dependent trajectories from the strategic PPPs to downstream decisions and actions before they become entrenched. When implemented early in the policy-planning and decision-making process for energy resource regions without a dominant decision trajectory or path (Noble and Nwanekezie, 2017; Noble et al., 2019), SEA can articulate a spectrum of future pathways for sustainable oil and gas development in Nigeria's new frontier basin regions before political and or economic opinions get entrenched. In this way, SEA can help broaden the scope of pluralism in environmental consideration based on long-term and strategic contexts to drive decision processes toward a more sustainable outcome, a crucial shift from the reactive project-based EIA practice. Therefore, the potential to change or alter the dominant path-dependencies and lock-ins of the current environmental management practice based on the EIA regime in Nigeria is significantly greater in scope through SEA due to its capacity to upscale environmental issues in regulatory decisions on opening new frontiers to potential hydrocarbon exploration and development early in the planning process before the manifestation of political and economic path-dependent trajectories that leads to lock-ins.

The study also found that public consultation and participation in the oil and gas-related processes in the prevailing EIA regime have been largely superficial and passive (see section 8.2.3). It also emerged that even in the most exemplary cases where public consultation and participation took place at the project-level assessments, the exercises were mainly focused on providing information about the oil and gas proposed project development and collecting feedback from local communities rather than fostering genuine dialogue and engagement to address strategic issues of interest to the diverse

stakeholders. This is not surprising that strategic concerns identified during project-level assessments are often difficult to address at that stage, as evidenced in the Niger Delta region (see section 8.2.4). Therefore, transitioning to SEA regulatory process in Nigeria can potentially promote early and meaningful consultation with stakeholders at the earliest appropriate stage of the planning process, creating a platform for dialogue, deliberation and negotiation on strategic issues prior to opening new frontiers to potential oil and gas drilling activities while strengthening consultation and participation at the project-level assessment and decisions. In this way, developers can have the opportunity to demonstrate how project design and mitigation measures are linked with broader strategic oil and gas development plans and policies, ultimately leading to better environmental and social outcomes (Fidler and Noble, 2012). SEA can also enhance the transparency of the energy development assessments and decision-making process, thereby increasing the acceptability of identified impacts, risks and opportunities associated with the opening of new frontiers to potential hydrocarbon development in the new frontiers and, in turn, can help reduce public opposition, planning delays and improve implementation. These potential and realised benefits of the strategic approach in the oil and gas sector have been reported in Atlantic Canada, the United Kingdom and Norway, where SEA was used to facilitate an early consultation with local communities to ensure procedural integrity of impact assessment, identification of ecologically sensitive areas where hydrocarbon development should not take place and consensus on the most desired and reasonable strategic options, awareness of the positive net benefits, all of which reduced the need to re-negotiate mitigation measures at the lower-tier assessments and fairer implementation of project (Noble et al., 2013; Fidler and Noble, 2012).

Finally, the result of this study noted that EIA practice in the Niger Delta region offered an opportunity for learning, particularly through the outcomes and interactions between developers, regulators and consultants. The learning elements uncovered in the analysis of the findings were centred on reflective scanning upon the contribution made by the EIA in working towards better environmental decision-making, sustainable development and environmental protection, including the limitations of the EIA processes in the oil and gas sector. This slow-learning process has been identified as the only endogenous

landscape factor that could aid in facilitating a transition toward SEA to plan for oil and gas development in the new frontiers (section 8.5.4). SEA has the potential to promote learning by establishing a platform that facilitates the provision, exchange and application of information and knowledge about the environmental composition and value to reach a consensus on how to address strategic issues of concern to relevant stakeholders, enabling the assessment of the anticipated environmental impacts associated with proposed development projects and the acceptability of the mitigations measures (Stoeglehner, 2010; McLauchlan and João, 2019; Sánchez and Mitchell, 2017; Cashmore et al., 2008; Pope et al., 2018). This knowledge brokerage can help encourage learning double-loop by way of challenging and changing the dominant norm in the environmental assessment regime, thus fostering change in attitude and how environmental decision-making is framed and designed to ensure sustainable development and environmental protection (Jha-Thakur et al., 2009). In the context of the energy sector, Fidler and Noble (2012) examined SEA's contribution to learning outcomes in oil and gas planning and development in Norway, the United Kingdom and Atlantic Canada. Their study revealed consistent learning across these case studies, attributed to participatory and consultative processes involving the interested parties and relevant stakeholders that may be affected by hydrocarbon exploration and development in the energy resources regions. SEA is thus intended not only to engage different perspectives in a fair and collaborative process but also to provide timely information and facilitate knowledge exchange among key stakeholders, leading to transformative changes in behaviours toward energy development assessment and the decision-making process. For instance, in Norway, SEA was used to inform the public and dispel misconceptions about the impact of oil and gas development on the ecological environment.

9.8 Chapter Summary

This chapter is the convergence point for the mixed method research strategy employed in this research. The discussion centred on the prevailing EIA regime in Nigeria's oil and gas sector. It explores the current state of EIA practice in the old frontier of oil and gas exploration and development in the Niger Delta region, the EIA institutional and regulatory framework, path-dependencies and lock-ins in environmental management,

as well as public consultation and participation. In this context, the chapter critically reflects on the limitations of the current practice of EIA in the oil and gas sector. Likewise, it discusses the need for, awareness and acceptance for a shift toward a more strategic approach as attention turns to opening the new frontier to potential hydrocarbon exploration and development in Nigeria. Moreover, the chapter reported on participants' perceptions of the potential critical decision factors that could help facilitate a strategic transition in the petroleum industry. Additionally, the chapter explored the status of the niche and its potential to foster SEA innovation, as well as the barriers to advancing a more strategic approach to oil and gas planning and development. Through the discussed results and the drawing on the principles of MLP, a transition-based model is presented in this chapter, which illustrates how the interlocking interplay between landscape, regime and niche processes could help propel a transition from the dominant project assessment practice to a more strategic approach in Nigeria's oil and gas policy sector. Finally, the chapter outlined the potential of transitioning toward the SEA process in Nigeria's oil and gas development assessment and decision-making to help inform the preparation of hydrocarbon development strategy and environmental management framework for the new frontiers and, in doing so, identify strategies and priorities for future management and development while enhancing the efficacy of traditional project-level EIA.

CHAPTER TEN

Summary, Recommendations and Conclusion

10.1 Introduction

This chapter summarises the key findings from this research and is divided into four sections. The first section provides an overview of how the research objectives were addressed within the thesis. The second section reflects on the principal contributions of this research to academic literature. The third section discusses the limitations and challenges that underpin this research. Based on the insights from the preceding sections, the chapter provides recommendations for potential further areas of research work and ends with a concluding remark.

10.2 Summary of research findings and addressing the research objectives

This research aimed to develop a transition-based EIA framework that identifies critical decision factors and pathways for transitioning from the traditional project-level assessment to a strategic approach in Nigeria's oil and gas environmental management regime. In order to achieve this aim, the research was guided by four key objectives that shaped the overall structure of the study. The ensuing sections provide a synopsis of how the research objectives were achieved.

10.2.1 Objective one: *To assess the impact of oil and gas exploration, production and operations on the environment and socio-economic in the old frontier of the Niger Delta region.*

This objective was achieved through a comprehensive analysis of data collected from the community survey in Chapter Six. The findings from the research study revealed that oil and natural gas development is overwhelmingly perceived as a blessing to Nigeria's economic and social growth. This is particularly evident in the Niger Delta region, where it has moderately reduced the rate of poverty through the creation of employment, income, promoting local businesses, infrastructure development and provision of public facilities through corporate social responsibility (Section 6.9). However, hydrocarbon extraction and production have brought about a resource curse, especially in terms of its

negative impact on the ecological environment and socio-economic status in the Niger Delta region. The decade-long crude oil and natural gas extraction and processing activities principally arising from the discharge of wastes, atmospheric emissions, oily drill cuttings, gas flaring, well treatment fluids and deck drainage have contributed far-reaching adverse consequences on environmental compartments of land, water and air, resulting in ecological degradation, diminished crop cultivation and reduced fish activity — resources that the local population heavily relies on for their livelihoods (Sections 6.6, 6.7 and 6.8). In sum, the findings of this study underscore the glaring reality of crude oil and natural gas extraction, production and operations in the Niger Delta region as a double-edged sword — offering economic and social growth and environmental issues.

10.2.2 Objective two: *To examine the strengths and weaknesses of the current EIA practice in oil and gas planning, regulation and development in Nigeria's old frontier of the Niger Delta region.*

In order to address this research objective, participants' views and perceptions on the role of EIA in oil and gas planning, regulation and development in Nigeria were collected using both quantitative and qualitative methods. These findings, detailed in Chapters Six, Seven and Eight, also highlighted the perceived weaknesses of the prevailing EIA regulatory practice in the Niger Delta region. The study confirms the insights embedded in an array of scholarship literature that the EIA is the principal regulatory regime underpinning environmental management and protection in the oil and gas sector. In terms of the main effect of EIA on the decision-making process, evidence in sections 6.10, 7.3, 7.4 and 8.2 showed that the information provided by the EIA process played a crucial role in establishing regulatory conditions for assessing the impact of oil and gas project development in the Niger Delta region. To that end, the EIA practice influences consent decisions and facilitates project redesigns or modifications before the formal submission of applications during the EIA process. However, these changes are typically minor and focus mainly on mitigating the adverse impacts of the project development with the passive participation of the relevant stakeholders, particularly the environmental NGOs and community members.

Nevertheless, despite the perceived characterisation of the EIA as an important environmental management tool, particularly in helping to facilitate environmental improvement of individual oil and gas project development in the Niger Delta area, the evidence from the research highlighted a litany of limitations surrounding environmental protection and management in the prevailing EIA practice (Section 8.2.4). The traditional project-level EIA practice was perceived to be overwhelmingly reactive and narrow-focused — and it is often implemented too late in the realm of decisions about oil and gas development and management of the impacts associated with such development in the Niger Delta region. As a result, the EIA often failed to influence or affect decisions about oil and gas development that have already been made at higher levels of policy, plan and programme formulation. In particular, the EIA regulatory process often failed to effectively explore alternative development futures and address issues such as alternative site selection, cumulative and transboundary environmental impacts and reconciling competing regional resource management concerns that are of interest to relevant stakeholders.

Against the backdrop of the limitations of the current project-based EIA practice in the Niger Delta region (Section 8.2.4 and 8.6), this study advances the need for a strategic EA approach to proactively address the environmental impacts of oil and gas development early in the planning process before key decisions are concluded and energy projects become a reality, at the strategic levels of policies and plans and programmes design (Noble et al., 2013; Fidler and Noble, 2012).

10.2.3 Objective three: *To critically identify the perceived critical decision factors for and barriers to facilitate a transition toward a strategic thinking approach in Nigeria's oil and gas planning, regulation and development.*

The findings from this research objective have identified three interlinked landscape influences or critical decision factors that could help shape the pace of the transition from project-level assessment to a strategic approach in oil and gas planning, regulation and development in Nigeria. At one end of the spectrum, the landscape influence comprises learning potential from the prevailing EIA practice in the old frontier of the

Niger Delta region. The findings indicate that the learning potential through EIA practice could help prompt a few dedicated niche and regime actors to begin questioning the rationale behind the continued reliance on the current project-based assessment regime to plan for and assess the potential impacts of oil and gas development in the new frontier basin regions. The reactive impact-based assessment approach with the potential outcome of a business-as-usual scenario, i.e. assessing mainly the impact of individual oil and gas project development akin to the current EIA practice in the Niger Delta region, may likely imperil the prospect of achieving sustainable environmental protection and management in the new frontiers where energy development is on the horizon. At the other end of the spectrum, the findings from this research showed that the broader exogenous landscape factors or conditions such as sustainability considerations, climate change issues and increasing demands for SEA implementation as a pre-condition for funding oil and gas development by the international multi-lateral and bi-lateral development agencies could serve as interrelated transition drivers toward SEA regulatory process in the energy development assessment and decision-making in Nigeria (Section 7.9.5 and 8.5). Thus, it can be argued that the success of transitioning from project-level assessment to a strategic approach to planning for and assessing the effects of hydrocarbon development in Nigeria would largely depend on these emergent landscape factors, which may likely be beyond the remit or control of the incumbent EIA regime actors.

Moreover, with the recent enactment of the PIA, which sets forth an ambitious plan to expand oil and gas development into new frontier basin fields that possess significant hydrocarbon resource potential, the findings of this thesis revealed that there is a window of opportunity for a transformative shift in environmental management regime in Nigeria's oil and gas industry. This research argues that the "Decision window" offered by the PIA presents an opportunity, at least in terms of establishing the policy imperative for environmental assessment in the new oil and gas frontier to advance beyond the reactive evaluation of individual, site-specific and direct and indirect projects impacts to incorporate broader regional and cumulative environmental issues at the higher-level of PPP-making. In other words, a transition from the dominant project-level assessment practice to a more strategic and proactive approach could help design carefully thought-

out decisions about where and when to open the new frontiers to potential hydrocarbon drilling activities and, in turn, ensure those decisions are framed within a broader environmental planning and management framework.

In conclusion, the findings from the research in sections 8.7 to 8.7.5 identified several potential barriers to the prospects of a transition toward a strategic approach in Nigeria's oil and gas industry, which include key features of the incumbent EIA regime that are characterized by patchwork and rigid institutional and regulatory arrangements, entrenched project-based assessment culture, value conflicts, disparate objectives, politics and power constellation, path-dependencies and lock-ins. It has been well argued that acknowledging and addressing these challenges is imperative for achieving a successful shift towards an SEA process in Nigeria's oil and planning, regulation and development.

10.2.4 Objective four: *To develop a transition-based EIA framework which highlights potential transition drivers and pathways that can enable the transition towards a strategic thinking approach in Nigeria's oil and gas planning, regulation and development.*

Underpinned by the imperative to mainstream strategic thinking approach to planning and impact assessment in Nigeria's new oil and gas frontiers through a transition to SEA, this study developed a transition-based EIA framework for the oil and gas policy sector. Drawing on themes identified from the research findings and the scholarship insights, the framework was conceptualised based on the multi-level perspective proposed by Geels (2002) — to illustrate how a transition from project-level assessment to a strategic EA could occur within the Nigerian oil and gas environmental management regime. The framework highlights how the interlocking interplay between landscape, regime and niche processes could help drive this transition. Such a transformative transition becomes necessary in Nigeria because there is no form of strategic approach to impact assessment and decision-making to help plan for hydrocarbon exploration and development in the new frontiers before making decisions and actions about individual oil and gas project proposals. Thus, the framework underscores that a transition toward the SEA regulatory process could potentially enable the consideration of environmental

impacts of hydrocarbon development early in the policy-planning process before critical decisions are made and oil and gas projects are ratified at the upstream level of decision-making of policies, plans and programmes. In this context, the framework postulates that SEA can allow for sustainability objectives and broad alternatives to be mainstream into the policy-planning and decision-making process and, in turn, enable a more comprehensive evaluation of alternative development scenarios for the new energy frontier basins while providing the context by which the traditional project-level EIA could be used to inform decisions and actions about whether a particular project contributes to the objectives for the new frontier where energy development is on the horizon in Nigeria.

In sum, the overarching intent of the transition-based EIA framework toward the SEA process is not to replace or discard the current EIA regulatory approach for project-level assessment but rather to complement and strengthen its efficacy to drive the oil and gas decision process towards a sustainable outcome in the new frontiers.

10.3 Contribution to knowledge

The contribution to knowledge in this research study is presented in three key dimensions: theoretical and empirical/methodological contributions, as well as contribution to policy in the oil and gas industry.

10.3.1 Theoretical contribution

In the course of conducting this research study, an array of concepts, models and frameworks from scholarship literature were reviewed. The multilevel perspective was identified as the most suitable framework and employed to guide the research. Empirical evidence confirms the application of MLP in developed countries such as the United Kingdom, Canada, the United States, the Netherlands, Denmark, and Ireland (Geels et al., 2016; Rweyendela et al., 2023; Geels, 2012; Nwanekezie et al., 2021; Paredis, 2009; Markard et al., 2012; Verbong, 2000). These studies demonstrate the value of MLP's value as a heuristic and middle-range framework for examining transitions across various economic sectors, including coal, transportation, waste management, renewable energy, water resources, agriculture and technological innovation. However, within the

research context, there is limited attention to the application of MLP in exploring transitions within the environmental management regime of the oil and gas sector, particularly in evaluating the potential shift from project-level assessment to a more strategic approach. As Geels (2019), the proponent and advocate of MLP, acknowledged, previous MLP studies have been overly focused on sustainability transitions, particularly in relation to technological advancements. Therefore, unlike the dominant focus of transition scholarship on other economic sectors, while overlooking environmental management regimes and practices in the oil and gas industry, this study attempts to address this underlying conceptual drawback within the research ecosystem.

Accordingly, this research theoretically contributes to knowledge by extending the application of the MLP developed by Geels (2002) to critically explore the potential for a transition toward a more strategic approach in Nigeria's oil and gas environmental management regime. The prime aim of this study is to understand how the interplay between landscape, regime and niche processes could help propel a transition from the dominant project assessment practice to a more strategic approach to guide the preparation of energy development strategy and environmental management framework for the new oil and gas frontiers. Prior to this research, no empirical studies had applied the MLP to examine the potential for such a shift in the environmental assessment regime within the petroleum industry. As a result, this study has added further theoretical depth to the body of transition management literature, particularly concerning the use of MLP in the context of oil and gas sector environmental regime.

Furthermore, while MLP typically conceptualizes transitions as non-linear processes, it often emphasizes that a transition represents a development, shift or evolution from one form, phase or style to another (Geels, 2004; Geels and Schot, 2007; 2010). This study addresses this limitation of the MLP by introducing the concept of continuous forward and backward transitions. The thesis demonstrates that transitioning from an EIA to a SEA regime does not involve discarding the current EIA regulatory approach for project-level assessments. Instead, it aims to complement and enhance the EIA's efficacy to help guide the oil and gas development assessment and decision-making towards more sustainable outcomes in the new frontier basin regions. Thus, the transition theorised

and discussed in this research represents not just a shift in environmental management processes but also a broader transformation in ideas, thinking, cognitive perspectives and practices. Furthermore, the learning process embedded in the transition-based model in this thesis is intended to occur through continuous loops of reflection and knowledge generation along the EIA-SEA spectrum. In other words, the learning process could impact the transition to SEA, and in turn, the outcomes of that transition could influence decisions and actions made within the existing EIA regime.

Additionally, this research has addressed another layer of criticisms levelled against the transition management theory in general and the MLP in particular for falling short in examining policy transition (Avelino et al., 2016; Kern and Rogge, 2018) and power dynamics and or relations (Avelino, 2017). This research bridged these shortcomings by exploring a transition in environmental policy regime in the petroleum sector, where environmental protection and management practice has become deeply entrenched in the incumbent and dominant EIA regulatory environment— in which power relations among diverse actors would play a key role in determining such a transformative shift.

Moreover, this research study contributes to knowledge by extending the frontiers within which transition theory, particularly the MLP model could be empirically explored. The majority of the scholarship literature on transition theory has predominantly focused on developed nations in the global North, with little attention paid to its application in developing countries in the global South. This study bridges this conspicuous gap by applying the MLP framework to an emerging economy like Nigeria, thereby broadening its relevance and applicability. Accordingly, this research represents the first empirical investigation employing MLP to offer insights into how a transition in oil and gas environmental management practice may likely unfold in Nigeria. It explores the dynamic interplay between landscape factors, a network of actors, and the well-established and resilient EIA regime within fragmented institutional arrangements, power dynamics, and the challenges of path-dependencies and lock-ins. These insights provide a nuanced understanding of how transitions can be shaped in a developing country like Nigeria, where entrenched practices and institutional inertia present significant barriers to change. Therefore, this study consolidates international experiences regarding the

application of MLP to environmental management transitions, offering valuable lessons that can be transferred to other jurisdictions within the contexts of developing countries and beyond.

10.3 2 Methodological/empirical contribution

Prevailing scholarship works on transition management theory, particularly the MLP framework, have not analysed data inductively wherein the data shape the development of conceptual framework but rather, deductively employing the MLP and literature to particular research contexts (Paredis, 2011; Lee and Yu, 2022; Shackley and Green, 2007). This research is the first to use an inductive paradigm, wherein data drives the development of a transition framework. For instance, the research used thematic insights from the findings to inform the building block that informed the conceptualisation of the transition-based EIA framework and deductively leveraged the MLP and the relevant literature that underpinned this research context.

Empirically, this study makes a novel contribution by conceptualizing a transition-based EIA to SEA within Nigeria's oil and gas policy sector, particularly as it relates to the ongoing transition of hydrocarbon development into new frontier basin regions. Environmental challenges are increasingly defining a new policy agenda for oil and gas development and management, as demonstrated in earlier chapters of this thesis. This research adds unique empirical value by situating the proposed transition-based EIA framework within Nigeria's evolving hydrocarbon development landscape. It offers a fresh context and analysis of the potential shift from project-level assessments to a more strategic approach, utilizing MLP as an analytical paradigm. The findings underscore the potential benefits of mainstreaming early strategic thinking in oil and gas planning, regulation and development as attention turns to opening new frontiers for crude oil and natural gas development. These empirical insights are highly relevant for policymakers, decision-makers, and developers in the petroleum industry, offering perspectives on the strategic benefits of transitioning toward a forward-looking approach to environmental management in Nigeria.

10.4 Limitations and challenges of this research

As with other research, this study is not without its limitations. Therefore, it is important to acknowledge that certain factors have impacted this research, constraining its scope, content and the process employed for this study. These limitations include:

Firstly, this research study was conducted in the midst of the COVID-19 pandemic, which imposed lockdowns in both the United Kingdom and Nigeria, restricting travel and raising safety concerns. These challenges hindered scheduled fieldwork visits to engage with research participants. In order to address these uncertainties, a dual-method approach was adopted in this study. This means that in-person data collection took place when travel was possible, while remote methods were employed when restrictions were in effect, with plans to return to conventional fieldwork as conditions improved. This flexibility allowed for opportunistic data collection and avenues to deviate from the original methodological plan and travel itinerary scheduled. For example, while the researcher was directly involved in administering questionnaires in the study area, the recruitment of the interviewees and conducting all the interviews in person became extremely difficult. As a result, some research participants were interviewed remotely, which limited the overall sample size to 25 participants. This opportunistic data collection strategy was facilitated by effective rapport-building, diligent relationship management, regular follow-up communications, and the use of online meetings. These efforts were consistently employed from the outset of the fieldwork through to the twilight stages of the study, ensuring continued engagement with participants and fostering a productive research environment despite the challenges faced. This approach helped maintain momentum in data collection, allowing for adaptability and sustained interaction throughout the research process.

The second limitation pertained to confidentiality issues in conducting this research, particularly given the sensitive and contentious nature of Nigeria's oil and gas sector. Given its perceived significance and influence, some interviewees were reluctant to comment on issues they deemed sensitive. This concern became apparent during the pilot phase. To address these challenges, the interview questions were carefully designed to safeguard confidentiality and participants were explicitly assured of the

professional management of all data collected. Additionally, an introductory letter — which conveyed the aim and objectives of the research as well as the potential outcome — was engraved and printed on university letterhead to demonstrate the credibility of the research and reinforce the imperative of ethical compliance regarding data confidentiality. As a result, all collected data were meticulously handled with a strict focus on maintaining participant confidentiality.

The third limitation stemmed from the scarcity of literature on SEA in Nigeria. The majority of research works on environmental assessment in general, and in the oil and gas sector in particular, have predominantly focused on project-driven EIA. This notable lack of scholarly materials on SEA has significantly influenced the scope and content of this research. The dearth of SEA literature can be attributed to the absence of formal or voluntary requirements for SEA in preparing national development strategies, including those within the oil and gas industry. Therefore, the conspicuous paucity of scholarship literature in the regulatory and academic landscape limited the availability of reference material, thereby constraining the researcher's ability to achieve the initial ambition to develop a transition-based SEA rather than the transition-based EIA presented in this thesis. Nevertheless, despite this constraint, the richness of the information gathered and the data saturation were sufficient to effectively achieve the overall aim of conceptualising the transition-based EIA to SEA for Nigeria's oil and gas policy sector.

10.5 Recommendations for future research

This research offers a new context and analysis of the prospects of a transition from project-level assessment to a strategic approach by identifying critical decision factors and transition pathways as well as developing a transition-based EIA framework for Nigeria's oil and gas industry. The thesis conceptualised the framework based on insights from the multi-level perspective of transition management theory. It underscores how the interplay between landscape, regime and niche processes could drive the shift from a project assessment to a more strategic approach. Such a transition to the SEA process could potentially inform the preparation of energy development strategy and environmental management framework for the new frontier regions and enable the identification of strategies and priorities for future management and development while

strengthening the effectiveness of traditional project-level EIA. However, it is important to note that the proposed framework is not definitive but rather, it is the first scholarly contribution that can be expanded through future research. For instance, one area for which future research studies should focus is the endogenous landscape factors or emergent conditions that could enable or constrain the transition to an SEA regulatory process in Nigeria, as this study primarily centred on exogenous landscape factors. Likewise, there is potential for future research to explore the status of the niche, particularly the extent to which it is shielded and protected by the regime actors to nurture the SEA development to fruition. This would also provide insights into the extent to which actors' collaboration, learning and experimentation play a key role in developing SEA innovation within the oil and gas sector.

Moreover, this study developed a transition-based framework for Nigeria's oil and gas policy sector, which has yet to be applied in practice. As such, it is recommended that further empirical research be undertaken to explore the practical implementation of this model. This research would help optimize the framework and identify any limitations or deficiencies that may arise during its application. The practical use of the framework is expected to raise new important insights questions and uncover additional opportunities for advancing the transition from EIA to SEA within Nigeria's petroleum sector. Prospective research studies should focus on evaluating the practical added value of SEA, particularly in guiding decision-making regarding opening new frontiers for hydrocarbon exploration and development. This would provide a more practical understanding of the value of SEA as compared to the theoretical potential outlined in the framework presented in this thesis. In the same vein, an array of scholarly research should be conducted to investigate the scope of SEA knowledge and the learning opportunities that arise from implementing the framework in Nigeria's oil and gas industry.

Furthermore, the replication of the research across other industries and contexts would also offer valuable insights, particularly on the potential for mainstreaming a strategic thinking approach in the preparation of national development strategies in Nigeria. This could validate the claims made in this research and contribute to a broader understanding of the potential of SEA across various sectors. By focusing on a different

development sector, future research could uncover wide insights and perspectives into the perceived and realised benefits of strategic EA beyond the oil and gas industry.

Finally, on a broader scale, there is also a notable gap in consolidating international experiences on transition in environmental management regimes from understudied regions in the Global South, such as Nigeria, where the conditions for MLP on transition may differ significantly from those in developed nations. Although the framework presented in this study was designed for Nigeria's oil and gas policy sector, it is sufficiently generic to allow for broader application and transferable learning. This again opens up further opportunities for research in other hydrocarbon-rich countries still reliant on traditional EIA approaches. However, it is crucial to recognise that certain key considerations—such as socio-political factors, environmental governance regime, niche actors and windows of opportunity—may be more or less relevant in different contexts. It is also imperative to note that developing, replicating or testing a transition framework rooted in MLP across various conditions and sectors will remain an important avenue for ongoing research within the academic community.

10.6 Conclusion

It is a foregone conclusion that major oil and gas exploration and development is looming in Nigeria's new frontier basin regions. However, the decisions regarding oil and gas development and the management of the environmental impacts associated with energy development are still made based on a project-by-project basis through EIA in the old frontier of the Niger Delta region. Although the EIA has been an important project planning tool, which to some degree showed some promise, at least in terms of mitigating the impact of individual oil and gas project development (Anyadiegwu, 2012; Anifowose et al., 2016; Onuora and Nnubia, 2021)—but it has rarely been able to deal with alternatives consideration, cumulative and regional environmental implications associated with such development in the Niger Delta region. Considering the limitations of the existing EIA practice and coupled with the fact that Nigeria is in the midst of a critical transformation in the path of its oil and gas development into the new frontiers, there is a need for a transition toward a strategic approach to help plan for hydrocarbon development and, in doing so, establish environmental management framework for the

emerging frontiers to proactively assess and manage the potential cumulative and regional effects of energy development initiatives.

Inspired by ideas from MLP of transition management theory, the thesis offers a new context and analysis of the prospects of a transition from project-level assessment to a strategic EA approach by identifying critical decision factors and pathways as well as developing a transition-based model for Nigeria's oil and gas sector. The framework developed in this thesis illustrates how the interlocking interplay between landscape, regime and niche processes could help propel a transition toward a strategic approach in the oil and gas development assessment and decision-making. The landscape influence comprises sustainability consideration, climate change issues, learning potential from the prevailing EIA practice in the Niger Delta region and coupled with the increasing demands for SEA implementation as a pre-condition for funding oil and gas development by the international development agencies. These varied factors form an external and internal context that actors within the EIA regime levels cannot influence. In principle, these countervailing landscape factors may likely create pressure on the incumbent regime that accounts for the lock-in in EIA path-dependency in oil and gas environmental protection and management to respond to the evolving ideas of SEA. Within this context, the research theorised that the PIA provides the necessary condition or policy window for a transition toward SEA innovations but may not be sufficient for the effective diffusion of the exiting EIA regime unless SEA ideas are supported by the regime actors and shielded to the point of maturity to become embedded within the prevailing environmental management practice. According to Geels (2002), the alignment of these dialectic interaction processes at the landscape-regime-niche interface could potentially help to drive a transition from prevailing unsustainable to a sustainable regime in any given system.

In view of the foregoing, the transition-based framework developed in this thesis highlights the prospects of transitioning from the EIA to the SEA approach in oil and gas development assessment and decision-making to fill the conspicuous and significant gaps in the prevailing project-based EIA practice in Nigeria. The study posits that a shift to a strategic approach could potentially ensure that the environmental cost or liability

of the proposed energy development initiatives are considered early in the planning and decision-making process before project decisions are taken at the upstream tier of policies, plans and programmes formulation. In this way, SEA could be used to help inform the preparation of oil and gas development strategy and environmental management framework for the new frontier basin regions and, in doing so, identify strategies and priorities for future management and development while creating the context by which traditional EIA could be used for project-level assessments and decisions (Doelle et al., 2012; CCME, 2009; Harriman Gunn and Noble, 2009; Vilaro et al., 2020). That being said, a strategic thinking approach put forth in this research is intended to have a tiered-forward effect — that's influences not only the strategic decisions and actions at the upstream tier of policies, plans and programmes formulation but also shapes the downstream project assessment and decisions (Nobel et al., 2013; Fidler and Noble, 2012). It can be argued that wherever such hierarchical or tiered policy-planning and decision-making context exists, the prevailing project-driven EIA can become effectively streamlined. This cascading potential of SEA is thus intended to enhance, rather than eliminate the need for project-level assessments altogether in environmental management practice in Nigeria's oil and gas sector. Therefore, the overarching transition intent embedded in this thesis is not to replace or discard the current EIA regulatory approach for project-level assessment but rather to strengthen and address its limitations to support decisions on opening new frontier basin areas to potential hydrocarbon exploration and development to achieve a sustainable outcome.

In conclusion, it is imperative to note that despite the well-founded rationale and perceived potential of transitioning from project-level assessments to a strategic approach in Nigeria's oil and gas environmental management regime, the study cautions against underestimating the potential constraints posed by the entrenched dominance of the EIA practice and norms, well-ingrained and resilient institutional arrangements that are characterized by path-dependencies, lock-ins, politics and power dynamics. These interrelated factors underscored the significance of the incumbent EIA regime in enabling or constraining a successful transition toward the SEA regulatory process in Nigeria's oil and gas industry.

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APPENDIX 1 — COMMUNITY SURVEY

PART A: COMMUNITY SURVEY QUESTIONNAIRE

Please tick one box only and fill in where appropriate

Section A: Respondents' profile

1. Which of the options best describes your job/occupation?

- a) Farming ☐ b) Fishing ☐ c) Trading ☐ d) Artisan ☐
e) Employed ☐ f) Unemployed ☐ g) Others ☐ (please specify)

2. How long have you lived in the Ahoada area?

- Less than 1 ☐ 1-5 years ☐ 6-10 years ☐ 11-15 years ☐ 16-20 years ☐
Over 21 years ☐

3. Which of the following describes your educational level?

- a) First School Leaving ☐ b) SSCE/GCE ☐ c) OND ☐ d) HND ☐
e) BSc ☐ f) Postgraduate ☐

4. What is your gender: a) Male ☐ b) Female ☐

Section B: Awareness of the environmental effect of oil spill pollution

5. How would you rate the negative effect of oil spill pollution in the Ahoada area?

0	1.	2.	3.	4.	5.
I don't know	Very high	High	Medium	Low	Very low

6. How many oil spill pollution incidents (s) can you remember in the last 20 years (2001-2021) in the Ahoada area?

0	1.	2.	3.	4.	5.
I don't know	0-5	6-10	11-20	21-30	Above 30

Section C: Causes of the environmental effect of oil spill pollution

7. In your opinion, which of the following do you agree or disagree are the main factors responsible for oil spill pollution in the Ahoada area?

Factors	0	1.	2.	3.	4.	5.
	I don't know	Strongly disagree	Disagree	Neither agree nor disagree	Agree	strongly agree
i. Operational failure						
ii. Vandalism/sabotage						
iii. Corrosion/rapture of pipelines						
iv. Lack of stringent environmental laws						
v. Ineffective regulatory enforcement measures						

Other factor? Please specify.....

Section D: The impact of oil and gas exploration on the environment and wellbeing

8. Which of these negative effects of oil and gas exploration do you often experience in the Ahoada area?

Categories of impacts		0	1.	2.	3.	4.	5.
		I don't know	Never	Rarely	Neutral	Often	Very often
I	Direct impacts (Caused by the oil & gas project activities)						
li	Indirect impact (Caused by the oil & gas project activities)						

	gas project activities, but occurs later or farther away than direct impacts)						
lii	Cumulative impact (Caused by the oil & gas project activities, plus pre-existing conditions, plus the actions of others)						

9. Select from the below the perceived negative effect of oil and gas exploration on the environment in the Ahoada area by ticking the appropriate option representing your concern opinion as extremely concern (5), very concern (4), not concern at all (3), somewhat concern (2), slightly concern (1) and I don't know (0)

Please indicate with a (✓)	0	1.	2.	3.	4.	5.
	I don't know	Not extremely concern	Not concern	Neutral	Concern	Extremely concern
Water pollution						
Air pollution						
Destruction of livelihood						
Environmental degradation						
Health-related problem						
Noise pollution						
Soil pollution						
Marine pollution						
Biodiversity loss						
Nuisance odour						
Climate change						
Insecurity/crime						

Other Negative impact? Please

specify.....

10. In what way has the negative effect of oil and gas exploration directly affected you in the Ahoada area?

Impacts	0	1.	2.	3.	4.	5.
	I don't know	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

i.	The activities of oil and gas exploration affected my farmlands/harvest						
ii.	The activities of oil and gas exploration affected my fishing areas						
iii.	The activities of oil and gas exploration polluted my sources of water quality						
iv.	The activities of oil and gas exploration polluted my air quality						
v.	The activities of oil and gas exploration affected my cultural/landscape settings						
vi.	The activities of oil and gas exploration affected my general wellbeing						

Other impact? Please specify.....

11. On the scale provided, indicate the perceived positive impacts of oil and gas exploration activities in the Ahoada area?

Advantages	0	1.	2.	3.	4.	5.
	I don't know	Not extremely important	Unimportant	Neutral	Important	Extremely important
i. Increase commercial activities						
ii. Increase employment opportunities						

iii.	Increase the economic condition of locals						
iv.	Decrease the level of poverty rate						
v.	Provide vital infrastructure development						
vi.	Raise environmental awareness						

Other advantage/positive? Please state.....

Section E: Participatory process/stakeholder involvement

12. How would you describe the relationship between your community and oil and gas companies operating in the Ahoada area?

0.	1.	2.	3.	4.	5.
I don't know	Very poor	Poor	Neutral	Good	Very good

13. Have you been involved in the participatory process of stakeholder engagement relating to oil and gas decision-making or in the processes resulting in the approval of oil and gas projects in the Ahoada area?

0	1.	2.	3.	4.	5.
I don't know	Never	Rarely	Neutral	Often	Very often

14. In your view, does stakeholder involvement inform/influence the oil and gas exploration planning in the Ahoada area?

0.	1.	2.	3.	2.	1.
I don't know	Extremely not influential	Not influential	Neutral	Influential	Extremely influential

15. In your understanding, to what extent has stakeholder involvement improved the mitigation measures and or consideration of alternatives in the oil and gas planning and development in the Ahoada area?

0	1.	2.	3.	4.	5.
I don't know	Extremely not improved	Not improved	Neutral	Improved	Extremely improved

16. State the extent you agree or disagree that the participatory stakeholder engagement process improved the quality of oil and gas decision-making?

0	1.	2.	3.	4.	5.
I don't know	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

17. Indicate if you agree or disagree with the following as the main barriers to public participation in the oil and gas planning and development. *Please rate by ticking the appropriate option representing your opinion.*

Barriers	0.	1.	2.	3.	4.	5.
	I don't know	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
i. Lack of adequate information						
ii. Lack of funding and resources						
iii. Lack of knowledge and understanding						
iv. Lack of equal opportunity to participate						
v. Lack of impact in the ultimate decision						
vi. Lack of interest/community spirit						
vii. Lack of time						

Other barrier? Please specify.....

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Section F: Compensation

19. Is there any compensation scheme for the impact/damage of the oil and gas exploration in the Ahoada area?

a) Yes ☐ b) No ☐ c) Not sure ☐

20. If yes, what is the nature of the compensation system in place (e.g. Individual/community compensation).....

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.....

.....

21. If no/not sure, do you think there is a need for a compensation scheme as a result of the oil and gas environmental impact in the Ahoada area?

0.	1.	2.	3.	4.	5.
I don't know	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

22. How do you perceive the adequacy of compensation for oil and gas exploration damages in the Ahoada area?

0.	1.	2.	3.	4.	5.
I don't know	Extremely not satisfactory	Not satisfactory	Neutral	Satisfactory	Extremely satisfactory

23. What do you consider to be the main barriers to the compensation claim or implementation for value lost as a result of environmental damage in the Ahoada area? *Please rank by ticking the appropriate option using the scale provided*

Barriers	0	1.	2.	3.	4.	5.
	I don't know	Strongly disagree	Disagree	Nether agree nor disagree	Agree	Strongly agree
i. Bureaucracy						
ii. Practical/operational procedures						
iii. Financial challenges						
iv. Corruption						
v. Legislation/multiple legal policy framework						
vi. Logistics of organising oil spill site visitation						
vii. Traditional governance structures in the communities						
viii. Lack of negotiating experts representing the locals						

Other barrier? Please specify.....

24. In your view, how can an effective and meaningful compensation scheme be achieved/improved in the oil and gas host communities?

.....
.....
.....
.....

Section G: Management of environmental effect of oil and gas exploration

25. State to what extent do you agree or disagree that the EIA tool is useful in mitigating the impacts of oil and gas exploration in the Ahoada area?

0.	1.	2.	3.	4.	5.
I don't know	Strongly disagree	Disagree	Nether agree nor disagree	Agree	Strongly agree

26. Generally, do you think EIA is helpful in protecting the biophysical environment from the negative impact of oil and gas exploration in the Ahoada area?

0.	1.	2.	3.	4.	5.
I don't know	Extremely not helpful in protecting the environment	Not helpful in protecting the environment	Neutral	Helpful in protecting the environment	Extremely helpful in protecting the environment

27. Please briefly explain why you gave the answer to the above question 26.

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28. In your view, how would you rate the performance of EIA in addressing the negative environmental effect of oil and gas exploration in the Ahoada area?

0	1.	2.	3.	4.	5.
I don't know	Very ineffective	Ineffective	Neutral	Effective	Very effective

Section H: Regulatory actors/stakeholders

29. Which of these regulatory agencies do you think have the most influence in the management of the environmental impact of oil and gas exploration in the Ahoada area?

Agencies	0	1.	2.	3.	4.	5.
	I don't know	Not extremely influential	Not influential	Neutral	Influential	Extremely influential
i. Federal Ministry of Environment (FME)						
ii. Department of Petroleum Resources (MPR)						

iii.	Federal Ministry of Petroleum Resources (MPR)						
iv.	National Oil Spill Detection and Response Agency (NOSDRA)						
v.	State Ministry of Environment (SME)						
vi.	State Ministry of Energy/ Natural Resources (SME/SMENR)						

Other agency? Please specify.....

30. State to what extent you agree or disagree that the relevant and responsible actors are doing enough to address the negative environmental impact of oil exploration in the Ahoada area?

Stakeholders	0	1.	2.	3.	4.	5.
	I don't know	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
i. Regulators/Government						
ii. Multi-national oil companies						
iii. Host communities						
iv. Developer/proponent						
v. NGO's						
vi. Donor organisations						

Other stakeholder? Please specify.....

31. Please state/list below any other issues that you think should be addressed to improve the current EIA in the Nigerian oil and gas sector

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.....
.....

APPENDIX II — EXPERT SURVEY QUESTIONNAIRE

PART B: EXPERT SURVEY QUESTIONNAIRE

Please tick one box only and fill in where appropriate.

Section A: The respondents' profile

1. Which of the options best describes you?

- a) EIA consultant ☐ b) NGOs ☐ c) Developer/proponent ☐ d) EIA regulators ☐ e) EIA academic expert ☐ e) Others..... (Please specify)

2. What is your highest level of education?

- a) a) Diploma ☐ b) BSc ☐ c) Postgraduate ☐

3. What is your gender: a) Male ☐ b) Female ☐ c) Prefer not to say ☐

4. How many years of experience do you have in dealing with EIA relating to Nigeria's oil and gas sector?

Years	0-5	6-10	11-15	16-20	Above 20

Section B: EIA process

5. How would you define the influence of EIA in Nigeria's oil and gas sector?

- a) Positive influence ☐ a) Negative influence ☐

6. If your answer to above question is 5 (a), then please select below how:

EIA:	0	1.	2.	3.	4.	5.
	I don't know	Not influential	Uninfluential	Neutral	Influential	Extremely influential
i. Reinforces environmental safeguards						
ii. Raises environmental awareness						
iii. Provides information to decision-makers						
iv. Enhances knowledge of the oil and gas project impacts						
v. Improves public participation						
vi. Promotes environmental governance						
vii. Improves project design						
viii. Provides well-founded decision making						
ix. Provides proactive environmental measures						
x. Improves relations between oil companies and the host communities						
xi. Improves capacity building and skills						

7. If your answer to above question is 5 (b), then please select below how:

EIA:	0	1.	2.	3.	4.	5.
	I don't know	Not influential	Uninfluential	Neutral	Influential	Extremely influential
i. Justifies predetermined judgement and decisions						
ii. Justifies superfluous reports to hide critical information						
iii. Justifies a bias by emphasising benefits and downplaying negative aspects						
iv. Justifies inequities in the project approval process						
v. Justifies restrictive involvement of the public in the decision-making						

Impacts identification

8. State the extent you agree or disagree that EIA assesses the impacts of oil and gas exploration on the following indicators.

Indicators of impacts	0	1.	2.	3.	4.	5.
	I don't know	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
i. Air pollution						
ii. Water/marine pollution						
iii. Loss or reduced socio-economic livelihood						
iv. Displacement of flora and fauna						
v. Displacement of the human population						
vi. Reduced human health						
vii. Biodiversity loss						
viii. Noise pollution						
ix. Destruction of archaeological heritage						

Other impacts? Please specify.....

9. To what extent do you agree or disagree that EIA focuses on the different impacts of oil and gas exploration in Nigeria.

Range of impacts		0	1.	2.	3.	4.	5.
		I don't know	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
i	Direct impacts						
ii	Indirect impacts						
iii	Cumulative impacts						

10. In your opinion, to what degree has EIA improved the consideration of alternative options in oil and gas project planning?

0	1.	2.	3.	4.	5.
I don't know	Strongly not improved	Unimproved	Neutral	Improved	Strongly improved

Section C: Environmental Impact Statement (EIS)

11. Indicate the extent you agree or disagree that EIS incorporates overall information on oil and gas project impact?

0	1.	2.	3.	4.	5.
I don't know	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

12. Generally, how would you rate the overall quality of EIS reports in Nigeria's oil and gas sector between 2001-2021.

0	1.	2.	3.	4.	5.
I don't know	Very poor	Fair	Neutral	Good	Excellent

Section C: EIA and decision making

13. In your view, how effective has the EIA process been in improving the oil and gas decision-making process?

0	1.	2.	3.	4.	5.
I don't know	Very Ineffective	Ineffective	Neutral	Effective	Very effective

14. To what degree, in your opinion, has EIA resulted in explicit consideration of the environment in the oil and gas decision-making?

0	1.	2.	3.	4.	5.
I don't know	Not very environmentally friendly outcome	Un-friendly environmentally outcome	Neutral	Environmentally friendly outcome	Very most environmentally friendly outcome

Section D: Stakeholder engagement/involvement

15. In your view, how would you describe stakeholder participation in the EIA process of oil and gas in Nigeria? *Please select a variety of options as applicable.*

0	1.	2.	3.	4.	5.
I don't know	Developer-driven participation	Regulatory-driven participation	Neutral	Community-driven participation	Expert-driven participation

16. To what extent do you perceive each of the below to have improved as a result of stakeholder involvement in Nigeria's oil and gas industry?

Public participation can:	0	1.	2.	3.	4.	5.
	I don't know	Strongly not improved	Unimproved	Neutral	Improved	Strongly improved
i. Environmental awareness						
i. Understanding & ownership of a project						
ii. Transparency and accountability in environmental planning						

iii.	Information flows between proponents, government and the host community in environmental decision-making						
iv.	Identifying areas of conflict of interest						
v.	Assessment of the magnitude & significance of Impacts						
vi.	Mitigation opportunities						
vii.	Quality and acceptability of mitigation management strategies						

17. In your view, which stakeholders have the most influence in the process of oil and gas decision-making?

Stakeholder	0	1.	2.	3.	4.	5.
	I don't know	Not very influential	Uninfluential	Neutral	Influential	Extremely influential
i. Government regulators						
ii. Statutory environmental consultee						
iii. Oil and gas companies						
iv. Host communities						
v. NGO's						
vi. Financial organisations						

Other stakeholders? Please specify.....

18. In your view, what are the main barriers to stakeholder involvement in Nigeria's oil and gas industry?

Barriers	0	1.	2.	3.	4.	5.
	I don't know	Not a significant driver	Insignificant driver	Neutral	Significant barrier	Very significant barrier
Physical remoteness						

Illiteracy/language						
Cultural differences						
Time/money						
Gender representation						
Inertia of locals						
Institutional culture of decision-making						
Pressure imposed by the project cycle						
Legislative ambiguity						

Other barriers? Please specify.....

Section E: Follow-up/monitoring evaluation in EIA

19. Which EIA follow-up activities have you been involved in?

	Stakeholders	0	1.	2.	3.	4.	5.
		I don't know	Very Insufficiently Involved	Insufficiently involved	Neutral	Sufficiently involved	Very sufficiently involved
i.	Auditing/Enforcement of EMPs						
ii.	Monitoring						
iii.	Evaluation (EIA efficiency check)						
iv.	Communication (reporting)						

20. Based on your experience and practice, how would you describe the degree of comparability of the actual impacts of oil and gas development with the EIS report's prediction?

0	1.	2.	3.	4.	5.
I don't know	Very incomparable	Incomparable	Neutral	Comparable	Very comparable

21. In your view, what are the most common barriers to EIA follow-up in Nigeria's oil and gas industry?

Barriers/factors	0	1.	2.	3.	4.	5.

	I don't know	Not a significant barrier	insignificant driver	Neutral	Significant barrier	Very significant barrier
i. Inadequate expertise						
ii. EIA follow-up benefits and cost-effectiveness uncertainties						
iii. Enforcement challenges						
iv. Poor EIS reports						
v. Limited finance						
vi. Legislative deficiency						

Section F: EIA challenges

22. State whether you agree or disagree with the following statements.

EIA shortcomings in Nigeria's oil & gas sector are:	0	1.	2.	3.	4.	5.
	I don't know	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
i. Unclear legislative guidance						
ii. Poorly defined roles of regulatory agencies						
iii. A paucity of baseline data						
iv. Expertise/financial resources						
v. Emphasis on project mitigation options						
vi. Limited in identifying alternative options						
vii. Inability to assess the uncertainty of the predicted impact						
viii. Limited in assessing regional & cumulative Impacts						
ix. Limited political will to support EIA						

Other

barriers?

Please

specify.....

Section G: Lessons learnt from EIA

23. In your view, what are the most likely lessons to be derived from the use of EIA in Nigeria's oil and gas industry?

Lessons of EIA usage	0	1.	2.	3.	4.	5.
	I don't know	Very unlikely	Unlikely	Neutral	Likely	Very likely
i. Instrumental						
ii. Communicative						
iii. Transformative						
iv. Participatory						
v. Environmental awareness						
vi. Environmental quality						
vii. EIA Knowledge						

Section H: Strategic Environmental Assessment (SEA)

Level of SEA familiarity

24. Unlike EIA, which is applied at the project level, SEA assesses the impact of policies, plans, and programmes (PPPs). How would you describe your level of familiarity with SEA as a concept?

0	1.	2.	3.	4.	5.
I don't know	Very Unfamiliar	Unfamiliar	Neutral	Familiar	Very familiar

SEA integration

25. In your view, how likely would you recommend SEA for environmental assessment of oil and gas policy and planning in Nigeria?

0	1.	2.	3.	4.	5.
I don't know	Very Unlikely	Slightly unlikely	Neutral	Likely	Very likely

A tool to strengthen the EIA shortcomings

26. To what extent do you think SEA would be an important tool for strengthening the shortcomings of the current EIA process in Nigeria's oil and gas sector?

0	1.	2.	3.	4.	5.
I don't know	Very insignificant	insignificant	Neutral	Significant	Very significant

27. In your view, how likely is it that SEA integration into the oil and gas sector would potentially improve the following?

Potential benefits of SEA	0	1.	2.	3.	4.	5.
	I don't know	Not improved	Moderately improved	Neutral	Improved	Strongly improved
i. Sustainable oil and gas project planning						
ii. Promote environmental thinking in decision-making.						
iii. Evaluation of broader cumulative						
iv. Impacts						
v. Better consideration of alternatives						
vi. Promote regional and strategic co-ordination						
vii. Meaningful and effective stakeholders participation						
viii. Improve environmental baseline studies						
ix. Improved confidence in the project assessment						

x.	Institutional co-ordination						

Other benefits? Please specify.....

Drivers of SEA integration

28. In your opinion, what could be the drivers of SEA integration into Nigeria's oil and gas industry?

SEA Drivers	0	1.	2.	3.	4.	5.
	I don't know	Very insignificant driver	Insignificant driver	Neutral	Significant driver	Very significant driver
i. Sustainability concern						
ii. Environmental consciousness						
iii. Influence of development cooperation						
iv. Multi-national financial incentives						
v. Climate change concern						
vi. Endogenous pressure of institutional actors						
vii. Pressure from oil and gas companies						
viii. Resistance to environmental pollution by locals/NGOs						

Other factors? Please specify.....

29. What are the most likely ways you think SEA would be integrated into oil and gas policy and planning in Nigeria?

Oil and gas strategies	0	1.	2.	3.	4.	5.
	I don't know	Very unlikely	Unlikely	Neutral	Likely	Very likely
i. The same EIA-based approach						
ii. SEA as a distinct exercise						
iii. SEA as an integral part of the preparation of policies, plans and programmes						
iv. SEA runs concurrent but independently from planning and policy-making						

Barriers to SEA integration

30. In your view, what are the main barriers to SEA integration into Nigeria's oil and gas industry? Please mark the appropriate option as applicable to represent your opinion.

- a. Lack of SEA provisions ☐
- b. Lack of priority for environmental thinking in decision-making ☐
- c. Lack of environmentally sustainable national strategy ☐
- d. Lack of political commitment ☐
- e. Organisational/institutional culture ☐
- f. Insufficient skills and human resources ☐

Other barriers? Please specify.....

32. Please list any other issues that you think should be addressed to improve the current EIA in the Nigerian oil sector.

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Many thanks for answering this questionnaire

APPENDIX IV — PETROLEUM INDUSTRY ACT

Extraordinary



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Government Notice No. 134

The following is published as supplement to this *Gazette* :

<i>Act No.</i>	<i>Short Title</i>	<i>Page</i>
6	Petroleum Industry Act, 2021	A121-370

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SCHEDULE TO PETROLEUM INDUSTRY BILL, 2021

(1) <i>Short Title of the Bill</i>	(2) <i>Long Title of the Bill</i>	(3) <i>Summary of the Contents of the Bill</i>	(4) <i>Date Passed by the Senate</i>	(5) <i>Date Passed by the House of Representatives</i>
Petroleum Industry Bill, 2021.	An Act to provide legal governance, regulatory and fiscal framework for the Nigerian Petroleum Industry, the development of host communities; and for related matters.	This Bill provides legal governance, regulatory and fiscal framework for the Nigerian petroleum industry, and the development of host communities.	15th July, 2021.	16th July, 2021.

I certify that this Bill has been carefully compared by me with the decision reached by the National Assembly and found by me to be true and correct decision of the Houses and is in accordance with the provisions of the Acts Authentication Act Cap. A2, Laws of the Federation of Nigeria, 2004.

I ASSENT



Oto O. A., fnia,fcia
Clerk to the National Assembly
9th Day of August, 2021.

MUHAMMADU BUIHARI, GCPR
President of the Federal Republic of Nigeria
16th Day of August, 2021.