

Portfolio Management in Oil and Gas Industry in Nigeria: A Case Study of the Upstream Sector

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Abstract

Portfolio management in Nigeria's upstream oil and gas industry is critical for optimizing asset performance, mitigating operational and financial risks, and ensuring long-term profitability. Given the capital-intensive and high-risk nature of upstream petroleum operations, a structured framework integrating asset allocation, diversification, risk governance, performance monitoring, and investment screening is essential. This study examines portfolio management practices within Nigeria's upstream sector, with emphasis on economic feasibility evaluation tools including Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period, Profitability Index, and Break-even Oil Price analysis. The study further analyses key portfolio components such as goal setting, action planning, capital allocation, rebalancing, reporting, and risk management within the context of Nigeria's regulatory and fiscal environment. The findings highlight the importance of integrated financial and strategic decision-making in enhancing investment resilience, optimizing resource utilization, and promoting sustainable sector growth. The study provides a practical framework for policymakers, regulators, and upstream operators seeking to strengthen portfolio performance in a volatile energy market.

Keywords: Portfolio Management, Oil Industry, Upstream Sector, Risk Management, Sustainable Profitability, Internal Rate of Return.

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1. INTRODUCTION

Nigeria's upstream oil and gas sector is a highly complex and dynamic sector of the national economy, encompassing the exploration and production of hydrocarbons from subsurface reservoirs. According to a 2024 report by Mordor Intelligence, Nigeria held approximately 208.62 trillion cubic feet of proven natural gas reserves as of 2022, underscoring the country's significant hydrocarbon endowment. Conventional assumptions often associate such vast resource wealth with national prosperity. However, the mere presence of abundant natural resources does not automatically guarantee sustained economic growth or structural transformation without effective governance and sound resource management.

Empirical evidence in development economics suggests that resource-rich economies frequently experience slower growth relative to resource-scarce counterparts (Auty, 1993; Olomola, 2007; Asogwa and

Okpongette, 2016; Omodero and Ehikioya, 2020). These findings align with earlier case studies by Gelb and Associates (1988) and Karl (1997), as well as econometric analyses conducted by Gylfason, Herbertson, and Zoega (1999) and Busby *et al.*, (2005). In the Nigerian context, Fefa (2017) similarly concluded that the country's abundant oil resources have not translated into effective wealth-creating ventures capable of delivering the desired level of economic growth. This reality underscores the critical importance of managing the nation's extensive petroleum asset portfolio in a strategic and sustainable manner.

A portfolio generally refers to the aggregate collection of financial and real assets owned by an individual or organization, including bonds, equities, oil and gas assets, real estate, and other investment instruments. Within the upstream oil and gas sector, petroleum assets constitute the primary portfolio components.

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The Petroleum Industry Act (PIA) 2021 provides the legal and institutional framework governing Nigeria's petroleum industry and its associated entities. The Act established the Nigerian Upstream Petroleum Regulatory Commission (NUPRC) and the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA). The former is responsible for regulating upstream petroleum operations, including exploration and production, while the latter oversees the technical and commercial regulation of midstream and downstream activities. These regulatory bodies are empowered to grant licenses, permits, and other statutory authorizations (Onuche *et al.*, 2024).

Given the strategic importance of the petroleum sector to Nigeria's economy and the significant environmental implications associated with its operations, petroleum assets are typically jointly managed by the Federal Government of Nigeria through the Nigerian National Petroleum Company Limited (NNPCL) under the supervision of the Federal Ministry of Petroleum Resources. Pursuant to the PIA 2021, NNPCL participates in joint venture arrangements between the Federal Government and major international oil companies, including Chevron, Shell Petroleum Development Company (SPDC), which has now divested its onshore assets to the indigenous Renaissance Africa Energy Company (Renaissance), Nigerian Agip Oil Company Limited (NAOC Ltd), which has also divested to Oando PLC, ExxonMobil, whose assets were acquired by Seplat Producing Nigeria Unlimited (SEPNU) and TotalEnergies.

Portfolio management refers to the structured and strategic process of selecting, allocating, and overseeing a collection of investments to achieve defined financial or organizational objectives. It involves decisions regarding asset allocation, risk-return optimization, and continuous monitoring and adjustment to enhance overall performance.

Within the upstream oil and gas industry, portfolio management entails the systematic evaluation and coordination of investments, capital allocation, and operational strategies across a portfolio of assets, projects, and business units. Its objective is to maximize portfolio-wide value by accounting for interdependencies, resource constraints, regulatory requirements, and stakeholder interests. Effective portfolio management therefore integrates robust processes, systems, and stakeholder engagement mechanisms to deliver optimal and sustainable outcomes.

2. Conceptual Framework of Upstream Portfolio Management

Upstream portfolio management integrates investment planning, asset diversification, capital allocation, and long-term production optimization. It draws from modern portfolio theory, which emphasizes

risk–return balancing across asset classes (Markowitz, 1952). In petroleum operations, asset classes include exploration prospects, producing fields, brownfield redevelopment projects, and frontier basins.

Key portfolio components include goal setting, action plan development, resource allocation, and diversification. Companies define production targets, reserve replacement goals, cost reduction strategies, and sustainability objectives. Action plans translate these goals into exploration campaigns, field development programs, and operational efficiency initiatives. The following section further explains these key components of portfolio management.

2.1 Components of Portfolio Management

The components of portfolio management function as interrelated mechanisms that collectively guide investment decision-making, resource allocation, risk mitigation, and performance optimization. Rather than operating in isolation, these components interact dynamically to enhance portfolio resilience and maximize value creation across asset classes. This section presents and examines the key components of portfolio management within the context of Nigeria's upstream petroleum sector.

2.1.1 Goal Setting

Goal setting constitutes the foundational component of portfolio management within the upstream oil and gas industry, providing the strategic direction upon which investment allocation, asset prioritisation, and operational planning are anchored. In petroleum asset portfolios, this process begins with the articulation of clear organisational imperatives such as production growth, reserves replacement, cost optimisation, energy transition positioning, and long-term value creation. Establishing these priorities ensures that capital deployment across exploration, development, and producing assets remains aligned with corporate strategy and shareholder expectations (Cooper *et al.*, 2001; Merrow, 2011).

Within the Nigerian upstream context, goal setting is strongly influenced by national production quotas, OPEC commitments, fiscal regime structures, and host-community considerations. Operators typically define strategic ambitions around increasing daily crude output, maturing discovered resources into proven reserves, extending field life in onshore and shallow water terrains, and enhancing recovery from brownfields in the Niger Delta. For example, indigenous operators acquiring divested assets from international oil companies (IOCs) often prioritise rapid production stabilisation and incremental reserve growth as immediate portfolio goals (Akinwale, 2020).

To operationalise strategic intent, goals must be translated into measurable, time-bound performance indicators. Upstream portfolios commonly adopt key

performance indicators (KPIs) spanning production volume targets, reserves growth ratios, unit operating cost reduction, safety performance, and environmental compliance metrics. Safety and environmental performance goals are particularly critical in Nigeria due to the ecological sensitivity of the Niger Delta. Portfolio strategies therefore integrate spill reduction targets, gas flaring minimisation, and emissions management in alignment with both national regulations and global ESG expectations (Eyinla and Ukpo, 2006).

2.1.2 Development of Action Plans

Following the establishment of strategic portfolio goals, the development of structured action plans becomes essential for translating corporate objectives into executable upstream projects. Action planning provides the operational roadmap that links investment decisions to field-level implementation, ensuring that exploration, development, and production activities are systematically prioritised, sequenced, and resourced. In petroleum portfolio management, these plans define project scope, capital requirements, execution timelines, risk controls, and performance monitoring frameworks (Merrow, 2011; Cooper *et al.*, 2001).

Within Nigeria's upstream sector, action plans are typically structured along the hydrocarbon asset life cycle, beginning with exploration programmes designed to expand the resource base. These programmes include seismic acquisition campaigns, reprocessing of legacy seismic data, basin modelling, exploratory drilling, development and completion and installing of the necessary surface network. Recent frontier basin initiatives such as exploration activities in the Dahomey Basin, Anambra Basin, and Chad Basin illustrate how national production sustainability goals are operationalised through structured exploration action plans (NUPRC, 2023). And deepwater developments such as the Agbami, Egina and Bonga fields exemplify large-scale portfolio development execution, requiring coordinated engineering design, floating production systems, and complex logistics planning (Adewuyi and Oyejide, 2012).

Operational optimisation initiatives also form a core element of upstream action plans. These initiatives target production efficiency improvements through interventions such as well workovers, artificial lift deployment, facility debottlenecking, and predictive maintenance programmes. In mature onshore Niger Delta fields, operators frequently implement production enhancement campaigns to counter natural reservoir decline and sustain output levels (Iledare and Suberu, 2010). Action plans also incorporate logistical and security frameworks unique to Nigeria's operating terrain. Marine transport arrangements, swamp rig mobility, community engagement protocols, and pipeline protection systems are routinely integrated into

project execution schedules to mitigate operational disruptions (Idemudia and Ite, 2006).

2.1.3 Resource Allocation

Resource allocation represents a pivotal component of upstream portfolio management, ensuring that financial capital, human expertise, and technical capabilities are optimally deployed to execute strategic action plans. Within petroleum asset portfolios, allocation decisions determine which projects advance, which are deferred, and how scarce investment capital is distributed across exploration, development, and producing assets. Effective allocation therefore directly influences production growth, reserve sustainability, and corporate profitability (Cooper *et al.*, 2001; Merrow, 2011).

In Nigeria's upstream sector, capital rationing is particularly critical due to high project costs, fiscal uncertainties, and infrastructure constraints. Operators must prioritise investments based on expected economic returns, technical feasibility, and alignment with corporate production targets. For instance, indigenous firms acquiring divested onshore blocks often allocate disproportionate capital toward rehabilitating idle wells and repairing evacuation infrastructure before embarking on new drilling campaigns (Akinwale, 2020). Performance monitoring forms an integral part of resource allocation governance. Upstream companies continuously track key performance metrics for periodic portfolio reviews, enabling management to reallocate funding, accelerate high-performing assets, or suspend underperforming investments in response to oil price volatility and operational risk exposure (Brett and Queen, 2018). Optimal resource allocation balances short-term revenue generation from producing assets with long-term value creation through exploration and development investments. For Nigeria, this balance is further shaped by local content requirements, security risk exposure, and regulatory compliance costs, all of which influence capital deployment efficiency and portfolio performance outcomes.

2.1.4 Diversification

Diversification constitutes a fundamental risk management mechanism within upstream oil and gas portfolio management, enabling operators to spread capital exposure across multiple assets, basins, and investment horizons in order to stabilise returns and mitigate operational and geopolitical uncertainties. Given the capital intensity and geological risk inherent in petroleum ventures, concentration of investments within a single asset class or geography can expose firms to significant financial volatility (Saetre, 2010; Brett and Queen, 2018). Companies frequently balance onshore, shallow water, and deepwater assets to optimise risk-return profiles. Within Nigeria, this strategy is evident where international oil companies (IOCs) maintain deepwater production hubs while divesting higher-risk onshore blocks to indigenous firms better positioned to

manage community relations and security complexities (Akinwale, 2020). Example is Shell Petroleum Development Company (SPDC) that has divested its onshore assets to the indigenous Renaissance Africa Energy Company (Renaissance).

Project evaluation and prioritisation underpin effective diversification planning. Investment screening typically integrates reserves volume, resource maturation probability, projected production plateau, capital intensity, operating expenditure, fiscal terms, and crude price outlook. Environmental compliance requirements and regulatory approvals also weigh heavily in Nigerian asset valuation due to stringent host-community and environmental governance frameworks (Iledare and Suberu, 2010).

2.1.5 Risk management

Risk management constitutes a core component of upstream portfolio management, encompassing the systematic identification, evaluation, and mitigation of uncertainties that may affect exploration, development, and production outcomes. Given the capital intensity, long project cycles, and subsurface uncertainty associated with petroleum investments, risk governance frameworks are essential for safeguarding asset value and ensuring portfolio resilience (Merrow, 2011; Aven, 2016). The risk identification process typically categorises upstream exposure into multiple dimensions: operational, geological, market, legal, financial, environmental and social risks. Operational risks arise from drilling hazards, well control incidents, equipment failure, and production downtime. In Nigeria, ageing infrastructure and pipeline integrity challenges further heighten operational vulnerability, particularly in mature onshore fields (Iledare and Suberu, 2010). Geological risks stem from uncertainties surrounding hydrocarbon volumes, reservoir continuity, pressure regimes, and recovery factors. Exploration drilling in frontier basins such as the Chad and Dahomey basins carries elevated dry-hole probability, making subsurface risk one of the most capital-sensitive elements of upstream portfolios (NUPRC, 2023).

Market risks reflect exposure to crude oil price volatility, foreign exchange fluctuations, and supply chain disruptions. For Nigerian operators, exchange rate instability significantly affects project economics due to the import dependence of drilling rigs, subsea equipment, and production facilities (Akinwale, 2020). Regulatory and legal risks emerge from fiscal policy changes, licensing obligations, environmental compliance requirements, and contractual disputes. The enactment of the Petroleum Industry Act (PIA) introduced new fiscal frameworks, host community funding structures, and regulatory institutions, thereby reshaping investment risk profiles across Nigeria's upstream sector (Onyekakeyah, 2021). Financial risks relate to capital availability, debt exposure, project financing costs, and partner funding commitments within

joint venture arrangements. Cash call funding delays historically posed material production risks in Nigeria's JV operations (Iledare and Suberu, 2010). Environmental and social risks are particularly pronounced in the Niger Delta, where oil spills, gas flaring, and land use conflicts influence corporate reputation and operational continuity. Community unrest and protests can disrupt production and escalate operating costs if social licence to operate is not sustained (Idemudia and Ite, 2006).

2.1.6 Performance Monitoring

Performance monitoring represents a critical control mechanism within upstream portfolio management, involving the systematic tracking, evaluation, and optimisation of asset and project outcomes to ensure alignment with corporate strategic objectives. Given the scale of capital deployment and operational complexity in petroleum developments, continuous performance oversight is essential for safeguarding investment value and sustaining production efficiency (Merrow, 2011; Brett and Queen, 2018). This process begins with the definition of robust key performance indicators (KPIs) spanning technical, financial, operational, and sustainability dimensions. Production-based metrics typically include daily output rates, facility uptime, and decline curve performance. Reserve indicators track proven reserve volumes, reserve replacement ratios, and field life indices. Financial KPIs such as net present value (NPV), internal rate of return (IRR), operating cash flow, and unit technical cost provide insights into project profitability and capital efficiency (Saetre, 2010).

Operational performance indicators focus on equipment reliability, non-productive time, drilling efficiency, and facility utilisation rates. In Nigeria, production downtime linked to pipeline vandalism, evacuation constraints, and power supply instability is a critical operational KPI monitored across onshore portfolios (Iledare and Suberu, 2010). Safety and environmental indicators including lost time injury frequency, spill incidence rates, and gas flaring volumes are also integral due to the ecological sensitivity of the Niger Delta and stringent regulatory oversight (Idemudia and Ite, 2006). Performance monitoring provides the evaluative backbone of upstream portfolio management, enabling petroleum operators to track value creation, diagnose operational inefficiencies, and implement continuous improvement strategies that sustain competitiveness within Nigeria's complex operating environment.

2.1.7 Rebalancing

Portfolio rebalancing constitutes a critical strategic function in upstream oil and gas asset management, involving the systematic realignment of capital, technical resources, and operational focus to sustain an optimal risk–return equilibrium over time. In capital-intensive petroleum provinces such as Nigeria, where geological uncertainty, fiscal regime dynamics,

security concerns, and oil price volatility intersect, rebalancing is indispensable for maintaining portfolio resilience and long-term value creation (Akinwale and Grobler, 2019; Iledare and Suberu, 2010).

The rebalancing process typically commences with a comprehensive assessment of the existing asset allocation structure. This evaluation examines how financial investments, technical capabilities, and operational resources are distributed across exploration, appraisal, development, and producing assets while identifying performance gaps. In the Nigerian upstream sector, such assessments often differentiate between onshore Niger Delta fields, shallow water blocks, and deep-offshore developments, each characterized by distinct cost structures, regulatory exposures, and production risk profiles (Deloitte, 2021; NUPRC, 2023).

Once performance gaps and emerging risks are established, firms formulate rebalancing strategies designed to optimize portfolio efficiency. One common approach involves the divestment of non-core or high-risk assets particularly mature onshore fields with escalating security and operating costs. Over the past decade, several international oil companies (IOCs) have executed such divestments in the Niger Delta, transferring assets to indigenous operators as part of strategic portfolio high-grading initiatives (KPMG, 2020).

Rebalancing is not a one-off exercise but an iterative process requiring continuous monitoring and strategic recalibration. Companies deploy portfolio dashboards, scenario modeling tools, and sensitivity analyses to track evolving asset performance under varying oil price, cost inflation, and fiscal scenarios. In Nigeria's volatile operating environment, such dynamic oversight enables firms to respond proactively to regulatory reforms, energy transition pressures, and security developments (McKinsey and Company, 2022).

2.1.8 Reporting

Reporting constitutes a critical governance and performance management function within upstream oil and gas portfolio management, serving as the principal mechanism for ensuring transparency, regulatory compliance, capital accountability, and evidence-based decision-making. In resource-dependent economies such as Nigeria, where upstream petroleum revenues significantly influence national budgets and foreign exchange earnings, structured reporting systems are indispensable for aligning corporate performance with regulatory expectations and stakeholder interests (NUPRC, 2023; NEITI, 2022).

The reporting process typically begins with the definition of reporting requirements, which establish the scope, frequency, format, and target audience of portfolio disclosures. Upstream operators develop multi-tier reporting frameworks tailored to internal executives,

joint venture partners, host governments, regulators, and financial stakeholders. In Nigeria, statutory reporting obligations are guided by institutions such as the Nigerian Upstream Petroleum Regulatory Commission (NUPRC), the Nigerian National Petroleum Company Limited (NNPC Ltd.), and the Nigerian Extractive Industries Transparency Initiative (NEITI), all of which require periodic disclosures on production volumes, reserves, lifting data, and revenue remittances (NEITI, 2022).

Following framework design, extensive operational and financial data are collected across the asset portfolio. Key performance indicators (KPIs) typically include crude oil and gas production rates, reserve replacement ratios, unit operating costs, capital expenditure performance, project delivery timelines, facility uptime, and health, safety, and environment (HSE) metrics. In Nigeria's upstream sector, additional indicators such as gas flaring volumes, local content utilization, and host community development commitments are increasingly incorporated into corporate reporting due to evolving regulatory and sustainability expectations (NCDMB, 2022; World Bank, 2021).

Through structured, technology-enabled, and stakeholder-responsive reporting systems, upstream oil and gas companies can enhance portfolio transparency, optimize strategic oversight, strengthen regulatory compliance, and support informed investment decision-making across Nigeria's complex petroleum operating environment.

2.1.9 Investment Selection

Investment selection represents a core decision-making pillar within upstream oil and gas portfolio management, focusing on the systematic identification, technical evaluation, economic screening, and strategic prioritization of capital projects to maximize shareholder value while sustaining reserve growth. In hydrocarbon-dependent economies such as Nigeria, where upstream investments account for a substantial share of national revenue and foreign exchange earnings, rigorous investment selection frameworks are essential for balancing profitability, fiscal obligations, and long-term resource stewardship (Iledare and Pulsipher, 2017; NUPRC, 2023).

The process begins with the establishment of clearly defined investment criteria that guide asset screening and capital deployment decisions. These criteria typically integrate expected financial returns, risk exposure, reserve potential, payback period, carbon intensity, and alignment with corporate growth strategy. Nigerian upstream operators—particularly joint venture (JV) and production sharing contract (PSC) entities—also incorporate fiscal terms, host government participation, and local content obligations into their

investment thresholds due to the regulatory provisions of the Petroleum Industry Act (PIA) 2021 (PwC, 2022).

Following criteria definition, companies undertake comprehensive multidisciplinary research and technical analysis. Geological and geophysical evaluations form the foundation of this stage, utilizing seismic interpretation, basin modeling, and exploratory drilling data to estimate hydrocarbon volumes and reservoir productivity. In Nigeria's prolific basins—such as the Niger Delta, Dahomey Basin, and Chad Basin—resource assessment uncertainty remains a major determinant of investment risk (Akinwale and Grobler, 2019). Consequently, probabilistic reserve estimation and play-based exploration models are widely applied to improve decision accuracy.

Economic feasibility analysis constitutes the next screening layer, involving detailed cash-flow modeling, capital expenditure (CAPEX) estimation, operating cost projections, and fiscal regime simulations. Metrics such as Net Present Value (NPV), Internal Rate of Return (IRR), breakeven oil price, and payout period are computed under multiple price scenarios to test project resilience. Given Nigeria's exposure to oil price volatility, sensitivity analysis is particularly critical for sanctioning deepwater and frontier basin developments (Deloitte, 2021).

The following key economic indicators are discussed with practical examples: Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period Profitability Index (PI), Discounted Payback Period, Break-even Oil Price, and Return on Investment (ROI).

Net Present Value (NPV)

NPV measures the profitability of an oil and gas project by calculating the present value of future cash flows, discounted at a chosen rate (usually the company's required rate of return). A positive NPV indicates a profitable project, while a negative NPV suggests a loss.

Formula:

$$NPV = \sum \frac{C_t}{(1+r)^t} - C_0 \quad [1]$$

Where:

C_t = Cash inflow in year; r = Discount rate (cost of capital); C_0 = Initial investment; T = Year

Example: An oil company plans to invest \$50 million in a drilling project, expecting cash inflows of \$15 million per year for 5 years. Assuming a discount rate of 10%, the NPV can be calculated as:

$$NPV = \frac{15}{(1.1)^1} + \frac{15}{(1.1)^2} + \frac{15}{(1.1)^3} + \frac{15}{(1.1)^4} + \frac{15}{(1.1)^5} - 50 = 6.86$$

If the NPV is positive, the project is viable. Since 6.86 is positive this project is adjudged viable.

Internal Rate of Return (IRR)

IRR is the discount rate at which NPV becomes zero. It represents the expected return of a project and is compared with the company's required rate of return.

Formula:

$$0 = \sum \frac{C_t}{(1+IRR)^t} - C_0 \quad [2]$$

Example: If an offshore drilling project requires an investment of \$100 million and generates annual cash flows of \$30 million for 5 years, IRR is the discount rate that makes:

$$0 = \frac{30}{(1+IRR)^1} + \frac{30}{(1+IRR)^2} + \frac{30}{(1+IRR)^3} + \frac{30}{(1+IRR)^4} + \frac{30}{(1+IRR)^5} - 100 =$$

If IRR = 15% and the company's required return is 12%, the project is profitable.

2.3. Payback Period

The payback period is the time required to recover the initial investment from net cash inflows.

Formula:

$$Payback\ Period = \frac{Initial\ Investment}{Annual\ Cash\ Flow} \quad [3]$$

Example: An EandP company invests \$40 million in a shale oil project that generates \$10 million per year. The payback period is:

$$\frac{40}{10} = 4\ years$$

If the company requires a payback within 5 years, the project is acceptable.

Profitability Index (PI)

PI is the ratio of the present value of future cash flows to the initial investment. A PI greater than 1.0 indicates a profitable project.

Formula:

$$PI = \frac{PV\ of\ future\ cash\ inflows}{Initial\ Investment} \quad [4]$$

Example: For an onshore field development:

Present Value of Cash Inflows = **\$120 million**; and Initial Investment = **\$80 million**

$$PI = \frac{120}{80} = 1.5$$

Since $PI > 1$, the project is profitable.

Discounted Payback Period

Unlike the regular payback period, this method accounts for the time value of money by dis

counting cash flow.

Example: For an offshore drilling project:

Initial investment = \$50 million; **Annual cash flow** = \$10 million; and **Discount rate** = 10%

The discounted cash flows are calculated each year, and the number of years required to recover **\$50 million** is the discounted payback period.

Break-even Oil Price

The break-even oil price is the minimum price per barrel needed to cover all project costs, including capital and operating expenses.

Formula:

$$\text{Break – even Price} = \frac{\text{Total Costs}}{\text{Total Production Volume}} \quad [5]$$

Example: If a deepwater project has:

Total Costs = \$500 million; Expected Oil Production = 50 million barrels

$$\text{Break – even Price} = \frac{500}{50} = \$10 \text{ per barrel}$$

If the market oil price is \$80 per barrel, the project is highly profitable.

Return on Investment (ROI)

ROI measures the profitability of a project as a percentage of the initial investment.

Formula:

$$\text{ROI} = \frac{\text{Total Profit}}{\text{Initial Investment}} \times 100\% \quad [6]$$

Example: For an oil sands project:

Initial Investment = \$200 million; Total Profit Over 10 Years = \$500 million

$$\text{ROI} = \frac{500}{200} \times 100\% = 250\%$$

A high ROI suggests strong profitability.

Each of these economic feasibility assessments provides a unique perspective on the financial viability of upstream oil and gas projects. By combining these metrics, oil companies can make informed investment decisions, optimize capital allocation, and reduce financial risk in upstream operations.

3. CONCLUSION

This study has demonstrated that effective portfolio management is indispensable to the sustainability and competitiveness of Nigeria's upstream oil and gas sector. Given the industry's exposure to geological uncertainty, capital intensity, regulatory reforms, security challenges, and oil price volatility, a structured and dynamic portfolio framework is required to balance risk and return across exploration, development, and production assets.

The integration of economic feasibility tools such as Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period, Profitability Index, and Break-even Oil Price analysis enhances investment screening and capital allocation efficiency. When combined with strategic goal setting, diversification, performance monitoring, and periodic portfolio rebalancing, these tools enable operators to optimize asset performance while safeguarding long-term value.

Within the context of the Petroleum Industry Act (2021) and Nigeria's evolving regulatory environment, upstream operators must adopt adaptive portfolio strategies that incorporate fiscal reforms, local content obligations, environmental governance, and host-community considerations. Strengthening data-

driven reporting systems and risk management frameworks will further enhance transparency, capital discipline, and investor confidence.

As global energy markets transition toward lower-carbon systems, Nigeria's upstream portfolio strategies must increasingly integrate sustainability considerations alongside profitability metrics. A forward-looking, financially disciplined, and risk-responsive portfolio management approach will be central to ensuring that Nigeria's petroleum resources translate into durable economic value and sector resilience.

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