



Targeting Goal Synergies and Transnational Partnerships for Petro-Energy Sustainability in Africa

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Abstract

Sustainability goals integration in a petro-context could be considered irreconcilable. Harnessing SD goal synergies in the African petroleum sector may even be supremely problematic. Africa still grapples with a knotty mix of convoluted challenges, ranging from poverty, insecurity, drought, to extreme underdevelopment. Having contributed the least to the global climate dilemma, Africa still must bear the brunt of negative climate impacts, whilst shouldering its daunting chunk of climate adaptation and mitigation commitments. Moreover, a huge dependency on fuel imports, escalating debt profile and funding shortfalls, plague many countries at the subregional levels. In a relentless chronicle of woes, the region exhibits the highest energy deficiencies whilst contending with excruciatingly prohibitive petroleum importation costs soaring over \$100 Billion USD annually. Similarly, Africa's annual investment projections for energy are an estimated \$190 billion USD. The implication is that, whereas the region has to achieve SD target obligations, its most credible means of optimising goal synergies, should be via an approach that targets energy sustainability, which remains an indispensable driver of most sustainability goals. To achieve this aim, a continental prioritization of regional partnerships is advocated to engender a sustainable petroleum sector. This is deemed crucial because of the considerable benefits the sector wields towards SDGs actualization and its relevance as a viable connector and pivot towards cleaner energy transition.

Keywords: Sustainable Development; Partnerships; Petroleum; Climate-Action; Finance

Introduction

The concept of sustainable development subsumed in the SDGs is a severely contested one as it envisages the amalgamation of multifarious and divergent goals. These include environmental protection and economic growth which on multiple levels may be considered irreconcilable. This paradigmatic concept targets the integration of all 3 pillars of environmental protection, economic growth, and social development. However, to actualize SDGs in a petro-context, the sector must underscore and fulfil core demands

which include environmental protection, (expressed via GHG and CO₂ mitigations, including biodiversity preservation), energy security, typified by accessibility, availability, affordability and more recently acceptability or reliability of products supplies for economic growth. Post the Paris Agreement in 2015, which reiterates the imperative of the transition into a low carbon economy, the industry is placed in the perilous position of bracing up to current signals regarding divestments of funds from the sector. Due to these daunting challenges, creating a nexus between petroleum exploitation and sustainable development becomes

imperative for developing petro-states in the African region as they are more reliant on hydrocarbon resources for driving their development agendas.

In view of the foregoing, this paper thus articulates and indorses extant theoretical frameworks proffered by international law and principles of sustainable development to elaborate on the contemporary issues which the global oil and gas industry must grapple with to engender petro-sector sustainability. In as much as this is potentially a challenge of humongous proportions as the industry must tackle and navigate the uncertainties incumbent in a carbon neutral future, surmounting these challenges from an African continental perspective remains potentially and supremely daunting. The paper is divided into six distinct sections which address specific areas relevant to the SDG framework from a petroleum industry context and how it can serve as a template to optimise SDGs actualization on a continental level. The paper via this approach and in the foregoing sections proposes a path of least resistance and hardship to a continent which is least developed and suffers the highest energy deficiencies, since ultimately, development is hardly plausible in the dark.

The first section clarifies how international law and partnerships for sustainable development can bolster development goals of petro-states to optimize poverty eradication objectives towards emerging from the mire of underdevelopment. The second and third sections re-echo the inevitability of international cooperation and good governance objectives enunciated in international legal instruments as viable tools for synergies towards funding, investments, research, technology, and innovation on a regional level as crucial drivers of sustainable growth objectives within an industry as globalized and dynamic as the petroleum industry. The concluding sections propose recommendations on mustering points towards regional scale collaborative efforts to engender petro-funds, petro-innovation, and petro-markets within Africa. This will ultimately tackle both the demand and supply sides of energy deliverables within the continent. These propositions are thus posited as crucially realistic and viable pathways towards eradicating energy poverty and fostering energy sustainability that is not detrimental to regional sustainable development.

Sustainable Development Goals Synchronisation and the Petroleum Sector

Undoubtedly, the petroleum industry contributes to sustainable development in multiple ways by creating synergies across goals like poverty eradication via direct and indirect employment creation, energy security, economic growth through the state's generation of substantial

tax incomes and other revenues, including prompting technological advancement and innovation from more advanced economies. However, the petroleum industry's massive potential to impact on broad ranging factors positively or adversely as articulated by the SDGs, traversing economic growth, ecosystems management & protection including social development makes it a topical aspect of the sustainable development discourse. The obvious challenge being, how to generate more synergies across the SDGs rather than trade-offs [1].

For purposes of clarity, it is pointed out that the SDGs are interlinked, and predicated on a premise of goals harmony and synchronization for overall attainment of sustainable development. Thus, to optimize goal synergies and coordination, it is evident that, the pursuit of goal 14, affecting the sustainable use of oceans, or goal 15 on terrestrial ecosystems, halting of deforestation and ensuring sustainable consumption directly will positively impact goal 13, on forestalling climate change and its dire implications. Nevertheless, the causal links between energy generation via fossil fuels use and climate change makes it a nagging issue requiring the need for targeting its amelioration via the targets and indicators of SDG 13, which stipulates the integration of climate change measures into national policies, strategies, and planning. It is also clarified that the burning of fossil fuels can produce around 21.3 billion tons of carbon dioxide (CO₂) per year. Carbon dioxide is a greenhouse gas that increases radiative forcing and contributes to global warming. More so, the ability of climate change or its effects to severely heighten inequality or aggravate inequities against the poor or disadvantaged cannot be cursorily dismissed as this directly impacts upon the attainment of the SDGs. The world's poor and vulnerable who are largely represented in Africa, are most susceptible to climate change and have minimal resistance or adaptive capacity to cushion the shocks and harsh effects. Some of these harsh effects range from the exacerbation of hunger, poverty, or inequalities between people and across countries to the impairment of health and well-being goals.

Figure 1 visually represents the connection, between the Sustainable Development Goals (SDGs) and different aspects of the petroleum industry. This representation is based on insights from the provided information. The heatmap in Figure 1 shows how each SDG intersects with elements of the petroleum sector such as poverty eradication, energy security and climate change. The colors used in this range from blue to red and indicate the nature of the impact. Blue represents an impact red signifies an impact and white indicates no significant impact. "Poverty Eradication" shows that it has an influence on both "SDG 13 (Climate Action)" and SDG 8 (Decent Work and Economic Growth)." This suggests that efforts aimed at eradicating poverty through

the petroleum industry can potentially align with these goals. On the hand “Climate Change” has an effect on both “SDG 13 (Climate Action)” and “SDG 8 (Decent Work and Economic Growth).” This emphasizes the challenges faced by the petroleum sector in contributing to climate action and sustainable economic growth. It underscores why it is crucial to integrate climate action plans, into petroleum development projects as stated in the text.

Figure 1 also shows areas where there is not an impact, such, as the connection between “Technological Advancement” and most SDGs. This suggests that the influence of technology in the petroleum sector on development is not straightforward and needs investigation. Nevertheless Figure 1 depicts the relationship, between the petroleum sector and the SDGs providing a guide that can assist in developing integrated and sustainable policies.

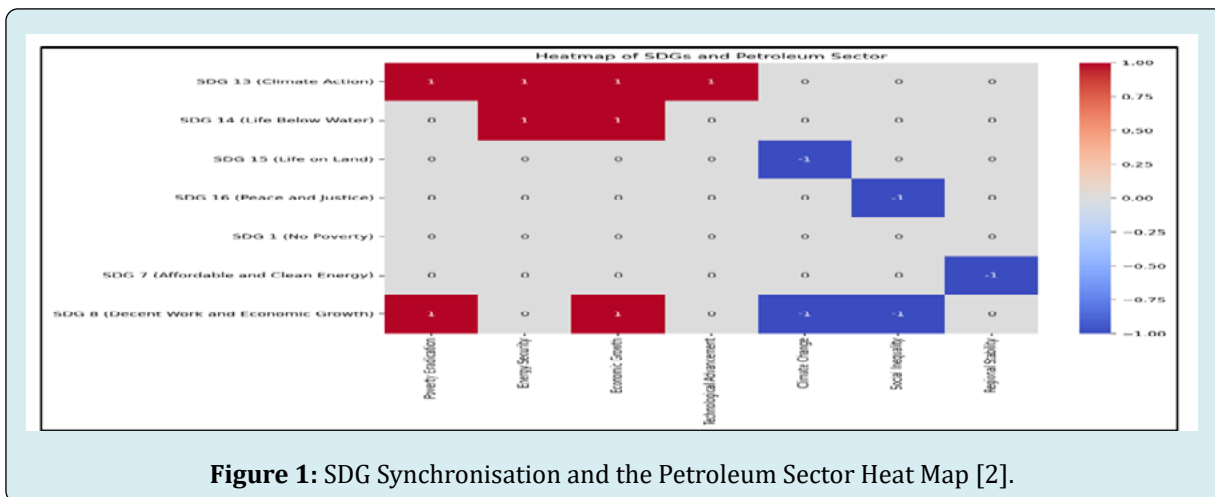


Figure 1: SDG Synchronisation and the Petroleum Sector Heat Map [2].

Thus, the need to effectively incorporate climate action plans into petroleum development projects or planning as part of national policies will serve to anticipate or put in place adaptive or mitigative measures to counter its debilitating effects whilst impacting positively on several goals. Similarly, a failure of integration or effective management efforts to tackle goals 14-15, affecting the sustainable use of natural resources, aquatic or terrestrial eco-systems and biodiversity during petroleum exploitation not only poses threats to food security but can severely impact goal 16 relating to peaceful societies and regional stability. This is quite evident from examples of oil induced conflict in Nigeria’s Niger-Delta, [3] Angola’s Cabinda region, or East and South Yemen [4].

Also countering the challenges regarding the SDGs actualization anchor heavily on local, national, and international collaboration, including broad-based expert and NGO participation. More so, this interaction between state, industry and community objectives with the SDGs allows for not just short, but medium to long-term collaboration to foster economic and social sustainability, including a greener petroleum sector in Africa. The SDGs tactically modify the erstwhile states-focused approach to sustainability, to act as a value-triggering means of operationalizing sustainable development of the petroleum industry, via a more expansive network of actors, including a wide-range of local and international participants who can contribute to relevant spheres of oil sector growth to trigger a multi-stakeholder involvement which leaves no one behind [5].

International Cooperation and Partnerships for Petro-Sustainability in Africa

In advocating the case for international partnerships and collaborations towards petro-industry sustainability on regional levels and in this case for Africa, it is clarified that cooperations, collaborations or partnerships for sustainable development are reiterated as essential platforms for continental attainment of sustainable development. International and regional partnerships serve as crucial standpoints towards galvanising support and strategies for harnessing or recouping development assistance, financial, technical, including human resources for actualizing development goals. It serves as a framework that guarantees the viability of transfer processes for securing sustainability and growth options of less developed regions by more advanced country counterparts. Such partnerships for economic, environmental and energy sustainability may thus adopt varied approaches which may be multilateral, bilateral, voluntarist or mandatory but must at its core drive accountability and the means of implementation of the requisite development agenda.

International collaboration or regional partnerships as advocated for Africa is stressed by goal 17 of the SDG framework, as well as various UN instruments such as Article 55 of the UN Charter which urges the need for urgent mobilization and action towards ensuring higher standards of living, full employment and sustainable development via

cooperation [6].

The overall implication of the foregoing is that goal 17 as represented in the SDGs framework from a policy and law perspective represents a platform for African countries to properly dialogue and prioritize continental energy sustainability issues which require speedy and sustainable solutions. This is needful for Africa to emerge from perpetual, undue and unsustainable reliance on foreign partnerships, which are proving more arduous to scale. It is thus reiterated that regional partnerships to nurture cooperation and infrastructure investments in the petroleum sector and at the same time reinforce sustainable practices to make energy trade more equitable on a regional level is proposed as a major requirement for Africa, in its quest for SDGs attainment.

Notwithstanding the varied views regarding international collaboration towards achieving sustainable development, whether it should be mandatory of voluntarist,

it is quite clear that a tougher approach, denoted by French as a “rights-based approach or legally binding solidarity [7]” towards international cooperation and international partnerships for fulfilling the SDGs could be more effective in the SDGs attainment. Such legally binding solidarity no doubt, could do more to expedite the achievement of the designated targets of Goal 17. Nevertheless, it is quite glaring that, despite the limitations of goal 17 and the inherent or corresponding difficulty created by the absence of an obligation to cooperate, the indorsing of international cooperation as a substantive goal of the SDGs reiterates its significance. Better still, Goal 17 presents the possibility of arrangements or affiliations capable of accommodating top-down and bottom-up approaches for driving sustainable governance in developing states, especially petro-reliant states in the African region. On the hand Figure 2 shows a network diagram that highlights the connections, between various elements. The central theme is closely tied to cooperation types, challenges, SDGs (Sustainable Development Goals) and specific international instruments [4-6].

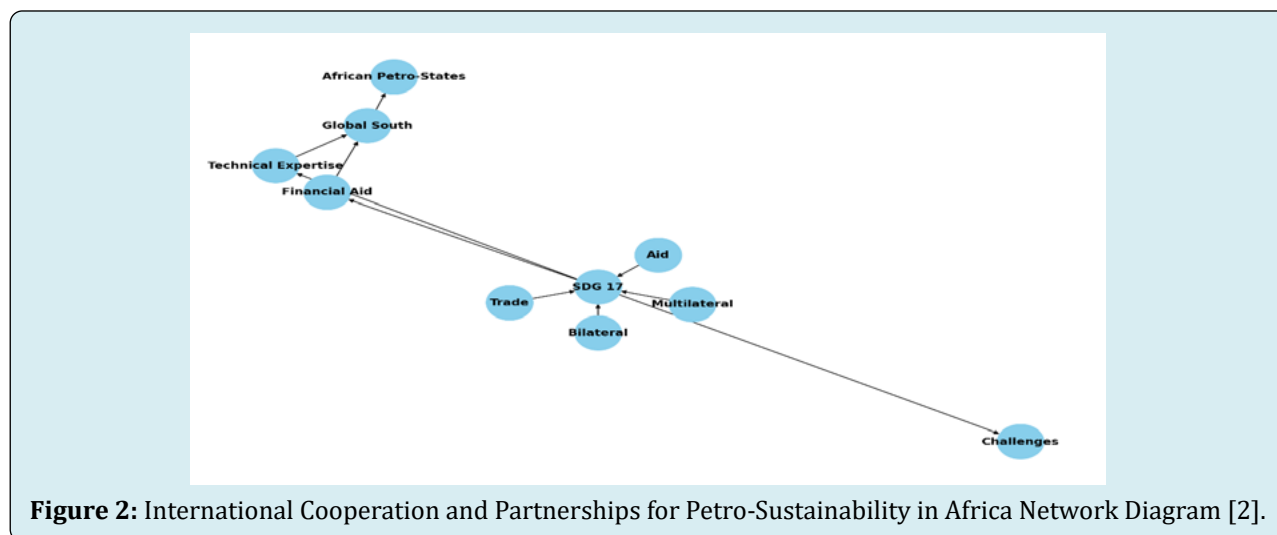


Figure 2: International Cooperation and Partnerships for Petro-Sustainability in Africa Network Diagram [2].

Figure 2 shows representation of the connections that exist between International Cooperation and Petro Sustainability, in Africa. It uses nodes and directed edges to represent elements and how they are interconnected. The nodes are categorized into types of cooperation such as Bilateral, Multilateral, Trade and Aid which all play a role in achieving Sustainable Development Goal 17 (SDG 17). This goal holds importance in fostering partnerships for sustainable development particularly in the petroleum sector within Africa. The directed edges linking these types of cooperation to SDG 17 highlight their contributions. For example, Bilateral and Multilateral cooperations often involve agreements or treaties between two or more countries with shared objectives aligned with SDG 17. On the hand Trade and Aid serve as mechanisms through which financial, technical, or human resources can be mobilized

and allocated. These resources are vital for the petroleum industry, in developing nations that possess oil reserves but lack the necessary technical expertise or financial capital to utilize these resources sustainably.

SDG 17 also encompasses aspects such, as the various challenges, financial assistance, and technical know-how. These factors play a role in comprehending the intricacies involved in achieving development in the petroleum sector. The challenges may involve issues, corruption or even environmental concerns that need to be addressed for governance. Financial aid and technical expertise serve as tools to mitigate these challenges. They represent the support provided by developed nations or international organizations to countries in the Global South nations heavily reliant on petroleum resources. This support can come in

the form of grants, loans, or technical assistance. The Global South represents developing countries holds importance as it receives financial aid and technical expertise, which are vital for building their capacities. It is directly linked to nations with petroleum industries indicating that any benefits or challenges faced by the Global South directly affect these states. This linkage is crucial since many African countries heavily rely on their petroleum resources, for growth.

Figure 2 also subtly suggests the contrasting perspectives, on cooperation. Developing states tend to see it as a duty whereas developed states view it more as an action. This underlying tension though not explicitly depicted has an impact on how international cooperation plays out. However, Figure 2 provides an overview of the interconnected relationships that shape the collaboration and sustainability of the African petroleum sector. It serves as a tool for policymakers, researchers, and stakeholders by representing the complex factors that must be taken into account for effective governance and sustainable development, in Africa's petroleum industry.

Harnessing Goal Synergies Rather than Trade-offs for Petro-Sustainability

In as much as there are significant gains from ensuring goals harmony across the sustainable development goals framework, it is however stressed that in a petroleum industry context, the issue of trade-offs remain substantial snarls in the overall attainment of sustainable development. Trade-offs are unavoidable whenever a juxtaposition of positives or negatives are required in concluding development decisions or policies. This is because in the midst of a convoluted mix of competing options, advancing either of economic, environmental or energy sustainability targets, some goals will ultimately be undermined. This is inevitable as the positive gains with respect to some goals will outweigh or overwhelm the downsides accruing from the underperformance of other sustainability goals. From a historical perspective, the oil industry is generally accountable for considerable negative environmental impacts or trade-offs, ranging from significant carbon trails, contrary climate impacts, ecological and habitats dilapidation in operational areas, which have heightened the clamour for decarbonization. Nonetheless it is clarified that the need for access to energy or in this case the securing of access and options for energy availability, accessibility and affordability remain the priority objectives for Africa. This is crucial for the continent's attainment of most of its sustainability goals and targets under the SDG framework.

Advancing synergies in the sustainability discourse especially in a petroleum exploitation context potentially

connotes a myriad of challenges. This is even more complex in the current dispensation where the clamour for decarbonisation has become louder. However, the African narrative requires some level of accommodation in the sense that the sustainability and prosperity of the region requires strategies that accommodate energy sustainability, economic growth, environmental protection, and social development. This argument is thus predisposed towards harnessing sustainability principles such as partnerships for the goals attainment as well as sustainable use of petroleum resources via an approach that engenders the longevity of petroleum resources whilst underpinning growth and adopting technologies that preserve the environment in the course of petroleum exploitation. Ultimately, if the continent must thrive, measures targeting synergies in these areas are vital to achieve a transition that will not wreak havoc on the energy sustainability options of the continent or sabotage livelihoods and environments.

Synergies in this area thus clarify the need to ensure that goal 12 which advocates the reduction of unsustainable patterns of production and consumption must be avoided. In a petro-context, synergies must target the mainstreaming of national and regional policies that optimise petro-resource elongation. In as much as petroleum resources are non-renewable or non-living natural resources, it still comes within the purview of natural resources that must be protected or managed for achieving sustainable growth and energy targets of associated parties regardless of national, sub-regional or regional affiliations. This presupposes the UN's clarification that synergies optimising petroleum resources and environment preservation remain imperatives and constitute the overarching aim of sustainable development. For energy sustainability to be achievable in Africa, reasonable, or prudent use of petroleum resources cannot be considered a mere appendage or futile goal.

Targeting synergies in this area would therefore envisage holistic policies that require technological innovation towards prudent extraction techniques via smart and efficient processes and upscaling of waste minimisation in the sector. Harnessing SD goal synergies in this area thus anticipates not just prudent extraction of petroleum but optimising technology for efficient recovery of marginal or inaccessible fields. This serves to mitigate petroleum resource exhaustion, waste, and premature abandonment of fields. Policy and regulatory harmonisation would thus serve as platforms to engender tracking, review and reportage of petroleum resource, usage, consumption, and environmental footprint on production locations. Moreover, targeting synergies predicates the need to ensure policy clarifications towards well stipulations, minimization of drilling approaches that potentially harm the environment via petroleum wastage,

gas flaring, leakages, blowouts, explosions, or fires resulting from drilling locations with vacuous or unclear petroleum

related data.

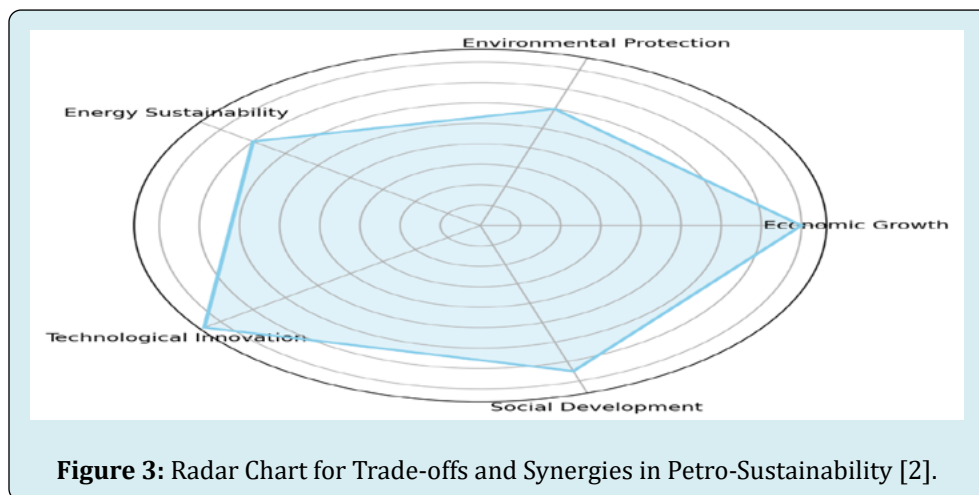


Figure 3 presents a perspective on five dimensions, Economic Growth, Environmental Protection, Energy Sustainability, Technological Innovation and Social Development. Each dimension is represented by an axis radiating from the centre. The distance from the centre to the point on each axis indicates its importance or performance. Starting with Economic growth Figure 3 shows a value suggesting that it holds importance in the context of petro sustainability. The petroleum industry plays a role in growth as it contributes significantly to national GDPs, employment opportunities and infrastructural development especially in regions rich in oil resources. The impact of the petroleum sector on economies cannot be underestimated, in developing nations. Its contributions extend beyond employment in exploration and extraction to roles in related industries, like transportation, refining and distribution [1].

Environmental protection however less is prioritized compared to growth, but it remains a significant concern. The petroleum industry has long been associated with challenges such, as carbon emissions, habitat destruction and oil spills. As awareness of environmental issues increases there is a growing emphasis on minimizing the impacts caused by petroleum activities. This aspect highlights the importance of adopting practices implementing regulations and advancing technology to mitigate environmental harm [1]. Additionally, energy sustainability holds significance in the discussion as indicated by its value. Energy sustainability revolves around responsibly and efficiently utilizing energy resources to meet needs without compromising the ability of generations to meet their own needs. In relation to the petroleum industry this entails optimizing extraction processes reducing waste generation and exploring energy sources. Since petroleum resources are finite, in nature achieving energy sustainability poses both a challenge and a necessity [1].

Technological innovation holds importance in the petroleum sector with an emphasis, on its role in promoting sustainability. The industry can overcome challenges by leveraging advancements in technology including improving extraction efficiency and minimizing impacts. Innovations, like enhanced oil recovery carbon capture and storage and digital monitoring systems have the potential to transform the industry's operations making them more sustainable and efficient [1]. Social development although crucial is given importance compared to the other aspects. The petroleum industry plays a role, in development. On one side it generates employment opportunities stimulates progress and contributes to public service funding. However, on the side it can also give rise to issues particularly in areas where extracting resources leads to inequality proceed, displacement of people or conflicts [1].

Sustainable Development and Petroleum Exploitation: Synergies with Climate Action Indicators

Harnessing goal synergies across the SDG framework in a petro-industry context, predicates the need to harmonise environment, economic, social and energy sustainability objectives. It also envisages petroleum resource sustainability objectives, which target the elongation of the lifespan and utility of hydrocarbon resources. The foregoing aims thus directly impact, intersect, or interlink growth and achievement of overall sustainable development of the petroleum sector. The pertinent environment targets from a petro-context therefore relate to mitigation of climate impacts denoted by Goal 13 affirming climate action. Goal 13 articulates the need to integrate climate change measures into national policies, strategies, and planning, with the key objective of increasing country parties' resilience and

adaptation to adverse climate impacts, whilst fostering climate resilience, and low emissions, albeit in a sustainable manner. This mandate however presupposes the articulation of well-rounded plans and strategies towards competent climate actions and mitigation.

Climate action presupposes climate mitigation, climate adaptation, carbon neutrality or decarbonisation. In a similar vein, climate mitigation refers to any acts or series of actions undertaken to obliterate or diminish the prolonged or persistent risks and hazards of climate change to human life or property. Climate adaptation on the other hand appraises the competence of a system to adapt or adjust to climate change. It addresses issues of climate variability or the resultant extreme impacts, and whether or not the potential accruable damage can be minimised or diminished by optimising opportunities to cope with the consequences. Carbon neutrality however targets the removal or eradication of carbon or CO₂ emitting energy sources. The key issues under this portfolio involve the elimination of the annual or net anthropogenic or human induced CO₂ emissions within stated timelines. The implication is that every ton of CO₂ emitted requires compensation with an equivalent CO₂ removal amount, via processes such as carbon sequestration or decarbonisation.

In furtherance of the foregoing, the Paris Agreement articulates a universal framework tasked with strengthening global response to the threat of climate change and at the same time proposing measures for climate change mitigation and adaptation [8]. It is also reiterated that these steps targeting mobilization for decarbonisation potentially raises obvious implications regarding the long-term sustainability of the petro-sector in Africa as it predicates more risks of actual trade-offs between climate responses and other ancillary SD goals. This is because climate responses ultimately require a departure from carbon emitting fuels or energy sources to enhance peaking of global emissions. This also directly impacts on the access to sustainable energies on a regional level with associated distributional effects. Moreover, the prohibitive and costly requirements of competent and extensive climate responses in Africa will entail a diversion of scarce resources from priority needs like poverty eradication, health, social welfare, and basic developmental infrastructure across much of the continent.

It is even more worrisome that deep decarbonisation climate responses and policies pose real threats to growth and energy sustainability of the region and would impose development limitations on the region as most of the constituent states are yet under-developed and lack core political, economic, technological, funding, or technical platforms to handle carbon departure without exacerbating poverty or impairing food and energy security. This is

directly antithetical to the aims of Goal 13 and associated indicators [9]. To prevent an upsurge of food and energy poverty, including associated challenges in developing states, Articles 2.2 and 4.4 of the Paris Agreement advocate the implementation of the Agreement in accordance with the Common but Differentiated Responsibility (CBDR) Principle. This principle is relevant as it appreciates the varied national circumstances of states and the apportioning of responsibilities or obligations for global environmental challenges. The CBDR principle interlinks or associates advanced levels of development to global environmental challenges with accompanying contributions and input to the deterioration of global environmental resources. These include atmosphere, water, or land. CBDR proposes appropriate distribution of responsibility. It demands that developed states which enjoyed the liberty of developing with scant environmental restrictions over time, be accorded a greater share of the remedial responsibility.

In this vein, “grace periods” or a deferred or less severe implementation of treaty obligations are made permissible for developing states. The Kyoto Protocol also makes a distinction between proposed goals for developed and developing states by requiring “developed countries to reduce their emissions while developing petro-reliant countries such as Nigeria, Sao Tome, or Angola, can report their emissions” [10]. The implication of the foregoing for the petro-sector is the need for crucial sector reforms that must holistically accommodate goal 8 for economic growth in tandem with goal 13 advancing climate action. Moreover, the considerable ecological or environment risks posed by greenhouse gas emissions or GHGs with the incumbent need to mitigate change by stabilisation of atmospheric temperatures to pre-industrial levels 1.5⁰-2⁰C, has raised considerable support towards a carbon neutral future or a low carbon economy. As a result, petro-states especially in Africa must eventually promote awareness of climate risks, invest in alternatives, and take practical steps towards policy and regional planning to diversify their economies and emerge from petro-dependence as part of adaptation efforts envisaged by Goal 13 and its targets. However, in the interim, it is advocated that for developing states or non-Annex 1 countries [11] to the Kyoto protocol, especially those predominantly susceptible to the considerable economic costs or implications of decarbonization, the paramount priorities as echoed by the Paris Agreement and the SDGs should be, energy sustainability, poverty eradication, food security and provision of basic needs to citizens.

Amalgamating goals 8 and 13 or achieving congruence between petro-economy. Climate and environment as much as it is desirable may not always be feasible. However, workable synergies between climate policies and petro-sector sustainability to drive sustainable development in

Africa are becoming viable possibilities through innovation in the sector. One example of such effective synergy within the oil industry and its impact on multiple goals was that of the Lead Campaign initiative [12]. This initiative sought to eliminate the use of lead in petroleum products in over 100 developing countries. The campaign involved collaboration between governments and oil producers. Its positive impacts ranged from diminished atmospheric pollution levels, lowered GHG emissions or ozone impairing substances, which minimized climate impacts, increased respiratory or health benefits from reduced urban air pollution and ultimately ensured the elimination of lead-related health expenses on household incomes.

However, certain unavoidable trade-offs relating to the implementation of this initiative included the phasing out of vehicles or equipment reliant on leaded fuels. This phasing-out process of lead reliant machinery of course impacted heavily on the poor. Even though in the short term, the initiative appeared to exacerbate poverty, the medium or long-term environmental and social benefits of the initiative far outweighed the initial drawbacks to engender

sustainable development. Other contemporary examples include the launch of methanol-reliant fuels vehicles which are becoming quite common in African oil producing states. It proposes lower climate impacts and at the same time affords goal synergies across divergent goals.

Figure 4 visually represents six factors that play a role, in understanding the intricate connection between Sustainable Development Goals (SDGs) and the petroleum sector specifically in relation to Climate Action (Goal 13). Each axis on the chart represents a factor; Climate Mitigation, Climate Adaptation, Carbon Neutrality, Economic Growth, Resource Allocation and Global Cooperation. It is important to note that the values assigned to these factors are hypothetical and serve as a starting point for data collection and analysis. In Figure 4 Economic Growth stands out with the score of 8 indicating its importance—especially for developing countries heavily reliant on the petroleum sector. Following behind is Global Cooperation with a value of 9 underscoring the necessity, for collaboration to effectively address climate Change and its impacts.

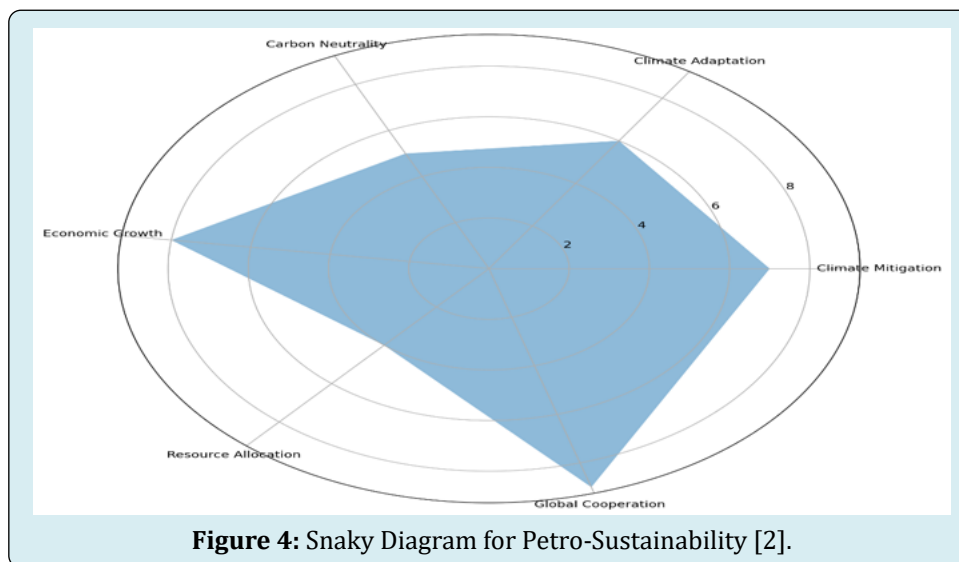


Figure 4: Snaky Diagram for Petro-Sustainability [2].

The values assigned to Climate Mitigation and Climate Adaptation are 7 and 6 respectively. This emphasizes the importance of both term and long-term strategies, in addressing climate change. Carbon Neutrality, with a value of 5 indicates that while it is an objective achieving it may be difficult due to our reliance on fossil fuels. On the hand Resource Allocation has the value of 4 suggesting the challenges involved in diverting resources from pressing needs like poverty eradication and social welfare to climate action initiatives. Looking at Figure 4 we can see that there are aspirations for growth and global cooperation. However, there are also obstacles when it comes to resource allocation and achieving carbon neutrality. This highlights

the necessity for an approach that takes into account both priorities and long-term goals. It also points out areas that may require efforts and resources to achieve a harmonious balance between conflicting objectives such, as economic development and environmental preservation.

Targeting Synergies or Partnerships for Finance, Trade and Petro-Sector sustainability in Africa

A further proposition for synergies and partnerships for the goals realization anchor heavily on sustainable finance. Sustainable finance as envisaged by the UNDP relates to

finance and funding arrangements required to expedite the attainment of the SDGs, whilst addressing environment, social and corporate governance objectives [13]. However, scaling the thresholds required for accessing sustainable finance from International Finance Institutions (IFCs) is proving more herculean for African economies as a distinction is drawn between projects that optimise climate objectives/targets and those that do not. Moreover, delineation is made between climate mitigation projects and adaptation projects. Whereas the Euro trend is skewed towards projects that offer net zero emissions possibilities by 2050, Africa which has contributed the least, that is, a negligible 2-3%, [14] to the global climate challenge has to suffer excessively regardless and brace up to weather shocks and the gravity of the impacts afforded by climate change. Moreover, foreign financiers impede access to funding as they are becoming more wary of “non-green” or brown investments such as fossil fuels portfolios. This unfortunately has detrimental implications on Africa as it undermines growth and prosperity of the continent. Even though global action is required to tackle these considerable challenges and high risks of loss and consequential damage from climate impacts, the requisite funding for African countries to adapt or survive such a predicament appears rather elusive.

From the foregoing, it is quite clear that Africa must emphasize on forging credible or viable partnerships to guarantee SDGs actualization. Such collaborations need to holistically tackle regional energy poverty, including sustainable funding towards eliminating food and water scarcity, engender trade, research, sustainable employment and development infrastructure. Such collaborations should also have consequential potential to optimize synergies across multiple SD goals. Certain partnerships such as the African Petroleum Producers Organisation (APPO), African Energy Bank, (AEB) African Development Bank, (ADB) Sustainable Energy Fund for Africa (SEFA), and trade possibilities under the African Continental Free Trade Area (ACFTA), thus represent sustainability lifelines or African solutions to regional challenges. Moreover, these listed organisations are considered as they wield possibilities that can nurture a thriving regional petroleum sector. They also proffer opportunities for diversification of the continent's energy mix and progression towards a sustainable transition.

Furthermore, Africa must brace up in the aftermath of divestment of crucial funds from oil and gas projects and sectors. This is expedient because wholesale reliance on foreign financiers could prove counterproductive for Africa due to associated uncertainties and even stall growth and development targets for the region [15]. In this vein, regional partnerships to generate development funding for the African petroleum sector to achieve SD goals actualization should be expedited. Recently, the African

Petroleum Producers Organisation (APPO) commenced upscaling of plans to establish the African Energy Bank which will serve as a crucial launchpad for petro-related economic development projects in Africa. This is inevitable as multinational banks and foreign financiers such as the World Bank, Standard Bank, Standard Chartered Bank, etc have escalated delinking of funds from sectors such as oil and coal which are considered to be “brown” investments or climate incapacitating and are ploughing support for “green” or climate friendly investments and bonds. Thus, the African petroleum sector faces real prospects of funding deficits as these financiers have cited environmental concerns as key considerations for defunding and imposition of severe conditions on funding arrangements.

It is for this reason that partnerships such as the Africa Energy Bank and APPO are considered as remarkable mustering points towards driving energy and financial sustainability goals in Africa from petro-based contexts. In a nutshell it is evident that Africa cannot persist as a -continent that will not invest in refineries and upscale refining capacities. Moreover, it is unsustainable for Africa to remain a persistent importer of refined petroleum products. For instance, the continent's largest oil producer, accumulated a humongous fuel import bill of N5.2 trillion in 2022, as it is gravely reliant on fuel imports due to its gross refining limitations [3,9]. Obviously, Africa's rescue from a precarious perch on the mire of underdevelopment, relative regional insecurity, escalating debt profile, severe energy poverty, lacking infrastructure across constituent states, drought, food and water shortages, exacerbated by the Covid pandemic and the Ukraine invasion, is only possible via a positive regional collaborative re-alignment. Other core areas bordering on access to sustainable funding and financing of African oil and gas projects to avoid investment stranding likewise constitute appreciable burdens which Africa must bear and at the same time generate innovative solutions for their reconciliation.

The African Energy Bank therefore proposes targeted investments from petroleum producers in the Middle East such as Saudi Arabia, the United Arab Emirates, Qatar, including Kuwait, whilst tackling funding limitations experienced by African oil and gas producers. Other partners such as the Sustainable Energy Fund for Africa (SEFA) can also serve as vital triggers or partners for attaining the energy sustainability goals for Africa. This is because SEFA operates a multi-donor special fund managed by the African Development Bank to stimulate green funding, for the renewable energy sectors in Africa. The implication is that SEFA can prove to be a strategic partner for funds mobilization and technical assistance towards the eradication of energy poverty in Africa as they primarily target SDG 7 on the provision of affordable, reliable and sustainable energy for

all in Africa. The fund is likewise made possible via European partnerships with countries such as Denmark, Norway, Germany, Spain, Sweden, United Kingdom, Italy, etc. Examples of such green funding projects include green energy projects and infrastructure in DRC Congo and Burkina Faso.

Despite the wealth of potentials in the African petroleum sector, ranging from the possibility of African gas exports to Europe replacing up to a fifth of Russia's, by 2030, and the likelihood of fast-tracking growth and infrastructural development, including eliminating energy poverty in the region, much still needs to be done to achieve access to sustainable finance and funding for the region. Funding contributions from regional finance partners to expedite energy transition is currently \$800 Million, with an additional \$200 million proposed for disbursement. However, the funding needs and requirements appear prohibitively high even at a regional collaboration level. Multinational financiers and international financing partnerships for the region are dwindling. Africa is unfortunately having to face the reality that sustainable financing for development projects is no longer a given.

For instance, the projected pledge of USD 100 billion, in 2015 at the Paris COP towards climate action for developing countries by 2020 is still unavailable, what has been proposed instead is an extension time of up to year 2050. Notwithstanding, the possibility of a wholesale harnessing of such funds still remain doubtful as a large sub-set of the continent still lack requisite institutional capacity. Whilst countries such as, South Africa, Morocco or Nigeria may qualify for donor funding towards climate mitigation projects ranging from renewable energy to energy efficient technologies and infrastructure, to engender a holistic transition and sustainable development, others in the region would however be mostly eligible for adaptation projects such as agriculture, water, health, etc which do not particularly guarantee overall long-term economic sustainability and holistic growth. Some of these adaptation projects do get stranded and lack requisite coordination due to funds and technical capacity as the IFC's are gravitating towards climate mitigation projects. It is even more ironical that up to 80% of essential climate-research funding affecting Africa is expended in Europe and the United States, with African countries as denoted by Kenya accounting for (2.3%) and South Africa (2.3%) totalling 4.5% for the entire Continent [16]. Such lop-sided funding however creates obvious challenges or gaps that negatively impact on research and development on a fundamental regional problem, it is also inimical to research growth, capacity development or implementation of research outcomes on a regional level.

The above complex and unfavourable scenarios do beggar the need for an African Continental approach to

engender research, trade, and funding for sustainable development. This vacuum hopefully can be decimated by regional collaboration as afforded by partnerships such as the African Continental Free Trade Agreement, (ACFTA). The ACFTA was established in 2014, however its potential and mobilizing capacity can be greatly enhanced if ratified by the majority of African governments. The ACFTA proposes the creation of a single market for economic integration in Africa which targets over a billion people with GDP projections of an estimated \$2.6 trillion USD, and has a projected capacity to lift 30 million people from excruciating poverty. This potential cannot be discarded or rendered redundant as, the propensity for growth as a region rests on the pooling or harnessing of the strengths inherent in such demography for economic growth and energy sustainability at a regional level.

Likewise, ACFTA strives to eliminate markets fragmentation to optimise regional trade competencies and promote economic growth. Thus, in a petroleum sector context, the ACFTA wields great potential as it can leverage on the larger population markets to dampen the considerable effects of global shocks, price volatility, and other disruptions to which the petroleum sector is greatly susceptible. Whereas the continent as a whole requires an estimated \$ 3 trillion USD for mitigation and adaptation financing, the continent still needs to harness as much of the gains derivable from petroleum production as much as possible before the inevitable transition to a decarbonised economy. Ultimately, the petro-sector still extends a viable pathway to cleaner fuels via natural gas. This is crucial as the continent is still largely burdened by energy deficits and actual prospects of monumental revenue deficits of approximately \$415 billion USD annually, which remains contingent on infrastructure upgrades towards climate resilience. The continent is also at risk of significant petro-sector related job losses that will ultimately undermine the SDGs actualization at a regional level. ACFTA similarly presents opportunities for mitigating the impacts of complex and incompetent supply chains that frustrate growth and impair cost-efficient modes of transporting fuels, as the continent is projected to become the largest importer of products by 2030.

Figure 5 below shows a visual representation of the complex interplay between various entities and factors that influence finance, trade, and petro-sector sustainability in Africa. Each node in the graph represents a key entity or concept, while the directed edges signify the relationships or flows between them. Starting with "Sustainable Finance," this node is directly linked to "SDGs" (Sustainable Development Goals), highlighting the critical role of finance in achieving these goals. The "IFCs" (International Finance Institutions) node is connected to "African Economies," indicating the challenging relationship between international funding and

local economic conditions. This is especially pertinent given the stringent requirements set by IFCs, which often make it

difficult for African nations to secure necessary funding.

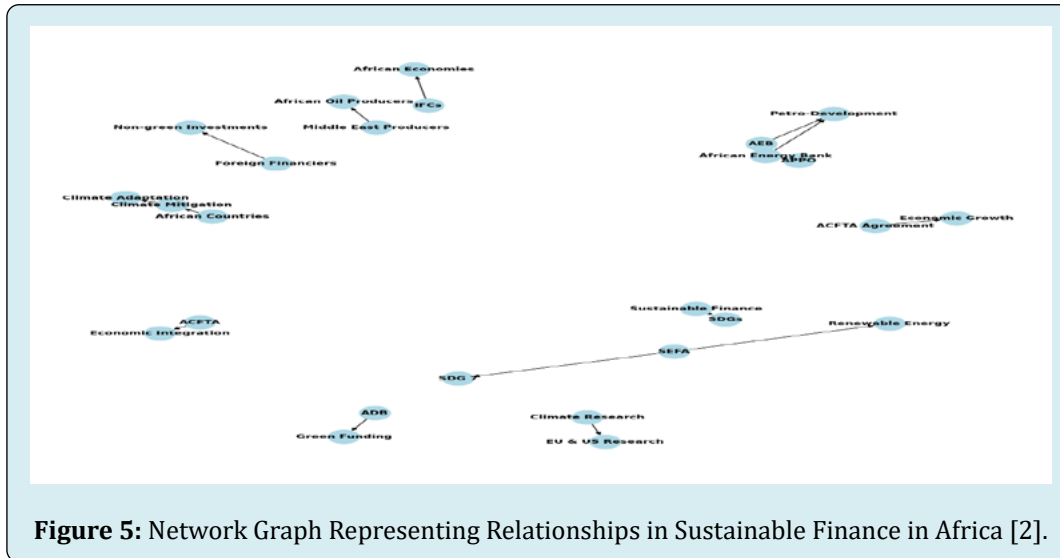


Figure 5: Network Graph Representing Relationships in Sustainable Finance in Africa [2].

Figure 5 also illustrates the contrast, between “Climate Mitigation” and “Climate Adaptation,” which are two approaches to addressing climate change. These considerations are vital for countries that are seeking funding for either type of project. The node labelled “Foreign Financiers” is connected to “Non-Investments” indicating the growing hesitancy of international investors to support projects based on fossil fuels. This has implications for Africa’s petroleum sector. Regional organizations such as the “African Petroleum Producers Organisation” (APPO) “African Energy Bank” (AEB) “African Development Bank” (ADB) and the “Sustainable Energy Fund for Africa” (SEFA) are also depicted in the diagram. Their interconnections highlight their role in promoting a petroleum sector and broader economic development. For example, APPO and AEB share a link symbolizing their efforts to establish a financial framework, for projects related to petroleum.

The node labelled “Middle East Producers” suggests collaborations, with oil and gas producers offering an alternative means of financial support and technical expertise. The entity known as “SEFA,” which is managed by ADB plays a role in targeting “SDG 7” which aims to make affordable and clean energy accessible. This particular aspect is significant because it can act as a connection between nations and European partners represented by its links to countries like Denmark, Norway, and Germany. The node labelled “African Countries” is associated with “Climate Mitigation” indicating a focus on projects that contribute to addressing climate change. However, the connections to “Climate Research” and “EU & US Research” point out the discrepancy in research funding, with the majority being allocated outside of Africa.

Finally, the African Continental Free Trade Agreement (ACFTA) plays a role, in promoting integration and is closely linked to the concept of Economic Growth. It has the potential to bring together markets thereby boosting trade and mitigating the impact of economic shocks on Africa’s petroleum sector. However, Figure 5 provides a roadmap for understanding the relationships that shape Africa’s pursuit of development in finance, trade, and the petroleum industry. This highlights the necessity, for an approach that involves partnerships at both international levels to effectively address the complex challenges faced by the continent.

Conclusion

In as much as the continent’s share of global emissions are ranked the lowest, as evidenced by countries with least development index, limited industrialization and minimal technological advancement, the priorities for the region therefore need to be energy transformation that is not detrimental to poverty eradication or antithetical to its socio-economic enhancement. This paper thus posits that regional partnerships for goals synergies towards a thriving petro-sector in the region is a necessity and represents the most viable lifeline for Africa to holistically achieve the SDGs. It is further recommended that a collaboration that fosters the cohesion towards investments and participation to expedite emissions reductions, via infrastructural upgrades is likewise essential. These upgrades must gravitate towards setting up energy efficient refineries, reduction of flaring to a barest minimum, upscaling of pipelines and gas infrastructure and investing on smarter and more efficient products transmission channels. These are proposed as practical and most viable of approaches towards the elimination of

unsustainable fuels imports burden on the region. These strategies also engender energy sustainability goals as they present robust platforms for networking and tackling most goals on the sustainability paradigm. Nevertheless, attaining these laudable and essential targets at a regional level is only possible via a multi-varied approach that leverages on the pooling of resources and competencies that optimise trade and collaborative efforts for a sustainable African petro-sector.

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