Sustainability in Africa's Oil and Gas Sector: A Critical Evaluation of ESG Principles and Emerging Technologies

By: Mwati Muriithi & Prof. Kariuki Muigua SC

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Abstract

This paper critically examines the extent to which Environmental, Social and Governance (ESG) principles can transform Africa's oil and gas industry into a vehicle for Sustainable Development. It argues that ESG principles provide a useful framework for addressing the environmental, social and governance challenges that have long characterised the oil and gas sector. The paper further explores the role of emerging technologies in enhancing sustainability outcomes in the oil and gas sector. The paper contends that sustainability in Africa's oil and gas sector requires a holistic approach that combines robust ESG frameworks, technological innovation, strong institutions, community participation and environmental justice.

1. Introduction

Africa's oil and gas sector remains one of the continent's most strategically important economic sectors due to its potential to stimulate industrialisation, generate public revenue, create employment opportunities and improve living standards.[1] The continent possesses substantial reserves of crude oil and natural gas distributed across countries such as Nigeria, Angola, Algeria, Libya, Egypt, Ghana, Mozambique and Uganda, among others.[2] These resources have positioned Africa as an important player in the global energy markets and a potential beneficiary of increasing global energy demand.[3]

Many African countries view petroleum extraction as an important avenue for accelerating socio-economic transformation and achieving development objectives.[4] However, despite the enormous promise associated with petroleum resources, Africa's experience with oil and gas extraction has been characterised by profound contradictions. [5]

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[1] Muigua, K., '*Oil and Gas Extraction in Africa: Employing ESG Tenets for Sustainability and Conflict Management*' available at https://kmco.co.ke/articles-publications/oil-and-gas-extraction-in-africa-employing-esg-tenets-for-sustainability-and-conflict-management/

[2] Oil and Gas in Africa: Reserves, Potential and Prospects of Africa., Available at https://assets.kpmg.com/content/dam/kpmg/za/pdf/Oil-and-Gas-in-Africa-2014.pdf

[3] McClay R, "*Understanding the Oil and Gas Industry: A comprehensive Overview,*" Investopedia, available at https://www.investopedia.com/investing/oil-gas-industry-overview/

[4] United Nations Economic Commission for Africa (UNECA), *Economic Report on Africa 2019: fiscal Policy for Financing Sustainable Development in Africa* (Addis Ababa: UNECA, 2019)

[5] Sachs JD and Warner AM, *"Natural Resource Abundance and Economic Growth,"* NBER Working Paper No. 5398 (1995)

In some jurisdictions, oil-producing communities continue to experience poverty, displacement and ecological destruction despite the wealth generated from resource extraction.[6] This phenomenon has often been described as the "*resource curse,*" whereby countries rich in natural resources paradoxically experience poor developmental outcomes.[7]

Environmental concerns associated with oil and gas extraction are particularly significant in the African context.[8] The Social implications of unsustainable petroleum operations are equally profound.[9] Governance deficits further compound sustainability challenges in the oil and gas sector.[10]

Against this backdrop, ESG principles have emerged as an influential framework for promoting responsible business conduct and sustainable investment practices.[11] The adoption of ESG principles has transformed expectations within the global extractive sector.[12] Companies operating in Africa's oil and gas industry are therefore confronted with the challenge of balancing profitability with social legitimacy and environmental responsibility.[13]

At the same time, rapid technological advancement presents both opportunities and dilemmas for sustainability governance within the petroleum sector.[14] Emerging technologies possess the capacity to improve environmental monitoring, enhance operational efficiency, reduce emissions and strengthen transparency throughout extractive value chains.[15]

The paper critically examines sustainability within Africa's oil and gas sector through the lens of ESG principles and emerging technologies. It argues that although ESG frameworks and technological innovations offer promising pathways towards more responsible petroleum

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[6] United Nations Environment Programme (UNEP), *Environmental Assessment of Ogoniland* (Nairobi:2011), available at https://www.unep.org/resources/report/environmental-assessment-ogoniland

[7] Ross ML, "*The Oil Curse: How Petroleum Wealth Shapes the Development of Nations* (Princeton University Press, 2012)

[8] U.S. Environmental Protection Agency, *"Environmental Impacts of Oil and Gas Extraction."* Available at https://www.epa.gov/hw/management-oil-and-gas-exploration-and-production-waste

[9] Cedric R., "*Accountability of Multinational Corporations for Human Rights Abuses,"* (2018) 14 (2) Utrecht Law Review 1.

[10] Extractive Industries Transparency Initiative (EITI), *Standard 2023,* available at available at https://eiti.org/sites/default/files/2023-06/2023%20EITI%20Standard.pdf

[11] Organisation for Economic Co-operation and Development, "*Environmental Social Governance (ESG) Investing,"* available at https://www.oecd.org/finance/esg-investing.htm

[12] Stuart LG, "*Firms and Social Responsibility: A review of ESG and CSR Research in Corporate Finance"* (2021) 66 Journal of Corporate Finance

[13] OECD, *ESG Investing and Climate Transition: Market Practices, Issues and Policy Considerations (Paris: OECD Publishing, 2021)*, available at https://www.oecd.org/finance/ESG-investing-and-climate-transition-Market-practices-issues-and-policy-considerations.pdf

[14] United Nations Economic Commission for Africa, *Advancing Technology Transfer for Sustainable Development in Africa* (2023), available at https://www.uneca.org/sites/default/files/TCND/STIF2023/Advancing_Technology_Transfer.pdf

[15] African Development Bank Group, *African Development Report 2012: Towards Green Growth in Africa'* available at https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/African_Development_Report_2012.pdf?utm_source=chatgpt.com

governance, their transformative potential depends upon the existence of strong institutions, effective legal frameworks and meaningful stakeholder participation.

2. Conceptualising Sustainability and ESG in Africa's Oil and Gas Sector

Sustainability generally refers to the creation and maintenance of conditions under which human beings and nature can coexist in productive harmony for the benefit of the present and future generations.[16] The modern understanding of sustainability is closely linked to the concept of sustainable development articulated by the World Commission on Environment and Development in 1987.[17]

Sustainability has evolved into the overarching framework underpinning international efforts to address global challenges including poverty, inequality, climate change and environmental degradation.[18] The United Nations 2030 Agenda for Sustainable Development and its seventeen (17) Sustainable Development Goals (SDGs) reflect this integrated vision by recognising that economic advancement, social inclusion and environmental protection are mutually reinforcing objectives.[19]

Within the extractive sector, sustainability requires balancing the economic benefits associated with natural resource exploitation against environmental and social considerations.[20] Sustainability within Africa's oil and gas sector necessitates careful management of competing interests and trade-offs.[21]

Environmental, Social and Governance principles have increasingly emerged as practical tools for operationalising sustainability objectives within corporate settings.[22] It encourages businesses to identify, manage and disclose risks and opportunities relating to environmental stewardship, social responsibility and governance effectiveness.[23]

The Environmental dimension of ESG focuses on how organisations interact with the natural environment.[24] Within the oil and gas sector, environmental considerations require companies to minimise ecological harm throughout the lifecycle of petroleum operations.[25] Environmental performance has consequently become a key indicator of corporate legitimacy and investor confidence.[26]

The social pillar examines the relationships between corporations and the people affected by their activities.[27] It encompasses labour rights, occupational health and safety, community

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[16] OECD, Op. Cit.

[17] Corporate Finance Institute (CFI), *"ESG (Environmental, Social and Governance)* available at https://corporatefinanceinstitute.com/resources/knowledge/other/esg-environmental-social-governance/

[18] OECD, Op. Cit.

[19] Corporate Finance Institute, Op. Cit.

[20] World Bank, *Environmental and Social Framework (Washinton DC: World Bank, (2018)*

[21] OECD, Op. Cit.

[22] Ibid

[23] Financial Times Lexicon, "ESG", available at https://markets.ft.com/glossary/searchLetter.asp?letter=E

[24] OECD, Op. Cit.

[25] Norton Rose Fullbright, *Environmental, Social and Governance (ESG): managing Risk and Creating Longterm Value,* available at https://www.nortonrosefulbright.com/en/services/203f40d1/environmental-social-and-governance-esg

[26] OECD, *ESG Investing and Climate Transition* Op. Cit.

[27] Corporate Finance Institute, Op. Cit.

engagement, diversity and inclusion, respect for human rights and equitable benefit-sharing arrangements.[28] For Africa's oil and gas sector, social considerations are particularly significant because extractive activities frequently occur within vulnerable communities whose livelihoods depend upon land natural resources.[29]
Governance represents the institutional architecture through which organisations are directed and controlled.[30] Strong governance mechanisms are essential for ensuring that environmental and social commitments translate into concrete action rather than remaining aspirational statements.[31] In the absence of robust governance structures, ESG initiatives risk degenerating into public relations exercises disconnected from actual practice.[32]

Although ESG presents important opportunities for advancing sustainability within Africa's oil and gas sector, its application must be critically assessed within the continent's unique socio-economic and political contexts.[33] The challenge therefore lies in adapting ESG principles to local circumstances while preserving their core commitment to accountability, justice and sustainability.[34]

3. Emerging Technologies and Sustainability in Africa's Oil and Gas Sector

The oil and gas sector, traditionally regarded as technologically intensive, is increasingly embracing emerging technologies to enhance efficiency, reduce environmental impacts and strengthen accountability.[35] In Africa, where petroleum extraction continues to play a critical role in economic development, technological innovation presents a unique opportunity to reconcile the competing objectives of energy security and social justice.[36]

The effectiveness of technology depends on factors such as regulatory capacity, financial resources, technical expertise, digital infrastructure and public trust.[37] Consequently, while emerging technologies hold significant promise for enhancing sustainability in Africa's oil and gas sector, they also raise important concerns relating to inequality technological dependence and governance.[38]

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[28] Stuart LG, Op. Cit.
[29] World Bank, *Environmental and Social Framework,* Op. Cit.
[30] Peterdy K & Miller N, *"What is ESG?",* Corporate Finance Institute, available at https://corporatefinanceinstitute.com/resources/esg/esg-environmental-social-governance/
[31] OECD, *ESG Investing and Climate Transition* Op. Cit.
[32] Ibid
[33] Muigua, K., *Embracing Environmental, Social and Governance Tenets for Sustainable Development'* available at https://kmco.co.ke/wp-content/uploads/2023/08/ESG-BOOK-.pdf
[34] Ibid
[35] United Nations Economic Commission for Africa, *Advancing Technology Transfer for Sustainable Development in Africa* (2023)
[36] African Development Bank Group, *African Development Report 2012: Towards Green Growth in Africa* (African Development Bank Group 2013)
[37] Muigua, K., '*Break Down the Borders: Using Technology to Reunite Africa for Trade, Innovation, Climate Justice and Sustainable Development*', available at https://kmco.co.ke/articles-publications/break-down-the-borders-using-technology-to-reunite-africa-for-trade-innovation-climate-justice-and-sustainable-development/
[38] Ibid

Emerging technologies can improve environmental monitoring, strengthen transparency, reduce emissions and facilitate more proactive forms of governance.[39] However, technology cannot resolve deeply entrenched political, institutional and socio-economic challenges independently.[40]
Accordingly, emerging technologies should be viewed as enabling tools as their effectiveness depends upon integration within broader frameworks grounded in environmental justice, democratic accountability and inclusive development.[41] Technology can support sustainability, but it cannot substitute for the political will and institutional integrity necessary to achieve it.[42]

4. Challenges Undermining Sustainability in Africa's Oil and Gas Sector

Despite increasing recognition of ESG principles and technological innovations, several challenges continue to undermine sustainability within Africa's oil and gas sector.

Weak institutional and regulatory frameworks remain a significant obstacle.[43] Many environmental agencies operate under conditions of inadequate funding, limited technical expertise and political interference.[44] These constraints weaken monitoring and enforcement efforts and reduce public confidence in regulatory institutions.[45]

Corruption and governance deficits continue to impede responsible resource management.[46] Lack of transparency in licencing processes, revenue allocation and contractual arrangements undermines accountability and fuels perceptions of injustice.[47]

Competing development and environmental priorities create difficult policy dilemmas.[48]African states face legitimate pressures to utilise petroleum resources to address poverty, infrastructure deficits and energy insecurity.[49] At the same time, growing international climate commitments encourage transitions away from fossil fuel dependence.[50]

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39 Institute of Sustainability Studies, '*The Role of Technology in Sustainable Development'* (Institute of Sustainability Studies), available at https://instituteofsustainabilitystudies.com/insights/guides/the-role-of-technology-in-sustainable-development/

40 Henrik S., *'Technology and Sustainable Development: The Promise and Pitfalls of Techno-Solutionism'* (Routledge 2023)

41 Organisation for Economic Co-operation and Development (OECD) *Environmental Justice: Context, Challenges and National Approaches (OECD Publishing 2024),* available at https://doi.org/10.1787/57616eb4-en

42 Muigua, K., '*Break Down the Borders: Using Technology to Reunite Africa for Trade, Innovation, Climate Justice and Sustainable Development*' Op. Cit.

43 United Nations Environment Programme, *Environmental Rule of Law: First Global Report* (UNEP 2019)

44 Ibid

45 Bennett NJ and Satterfield T, '*Environmental Governance: A Practical Framework to Guide Design, Evaluation and Analysis'* (2018) 11 (6) Conservation Letters

46 Ross ML, Op. Cit.

47 Extractive Industries Transparency Initiative, *The EITI Standard 2023*

48 UNECA, '*Economic Report on Africa 2019: Fiscal Policy for Financing Sustainable Development in Africa.*

49 Ibid

50 United Nations Development Programme, '*What is the Sustainable Energy Transition and Why is it Key to Tackling Climate Change?"* available at https://climatepromise.undp.org/news-and-stories/what-sustainable-energy-transition-and-why-it-key-tackling-climate-change

Limited financial and technological capacity constrains the adoption of innovative sustainability practices.[51] Emerging technologies capable of strengthening environmental governance often require investments and expertise unavailable within many developing economies.[52] Dependence upon imported technologies may also exacerbate inequalities and undermine domestic innovation.[53]
Social exclusion and inadequate community participation continue to undermine legitimacy within extractive governance processes.[54] Where communities perceive themselves as excluded from decision-making or denied equitable benefits, distrust and resistance are likely to emerge.[55] Sustainable Development cannot be imposed from above, rather, it requires inclusive and participatory approaches that recognise local agency and knowledge.[56]

5. Recommendations and the Way Forward

African states should strengthen legal and institutional frameworks governing petroleum operations.[57] Regulatory agencies require adequate resources, technical capacity and operational independence in order to discharge their mandates effectively.[58] Environmental laws should be enforced consistently and transparently without undue political interference.[59]

ESG disclosure requirements should move progressively from voluntary commitments towards mandatory and verifiable reporting obligations.[60] Standardised reporting frameworks accompanied by independent verification mechanisms can reduce opportunities for greenwashing and improve stakeholder confidence.[61]

Governments and Corporations should institutionalise meaningful community participation throughout the lifecycle of petroleum projects.[62] Participation should extend beyond formal consultations to include shared decision-making processes, accessible grievance mechanism and equitable benefit-sharing arrangements.[63]

Investment in science, technology and innovation should be prioritised.[64] African countries should strengthen domestic capacities in areas such as environmental monitoring, artificial

[51] African Development Bank Group, *African Development Report 2012: Towards Green Growth in Africa* (2013)
[52] UNECA, *Advancing Technology Transfer for Sustainable Development in Africa* (2023)
[53] Ibid
[54] OECD, *Environmental Justice* Op. Cit.
[55] UNEP, *Environmental Governance* Op. Cit.
[56] Ibid
[57] Muigua, K., '*Embracing Environmental, Social and Governance (ESG) Tenets for Sustainable Development'* Op. Cit
[58] Ibid
[59] Ibid
[60] Organisation for Economic Co-operation and Development (OECD) *Environmental Justice* Op. Cit
[61] OECD, *ESG Investing and Climate Transition* Op. Cit.
[62] World Bank, *Environmental and Social Framework* Op. Cit.
[63] Ibid
[64] UNECA, Advancing Technology Transfer for Sustainable Development in Africa (2023)

intelligence and digital governance in order to reduce technological dependence and improve sustainability outcomes.[65]

Petroleum revenues should be managed transparently and strategically to support long-term development objectives.[66] Resource wealth should finance investments in healthcare, education, renewable energy and economic diversification capable of benefiting both present and future generations.[67]

6. Conclusion

This paper has argued that Environmental, Social and Governance Principles provide a valuable framework through which challenges in the African oil and gas sector can be addressed. Properly implemented, ESG can encourage environmental stewardship, strengthen community relationships and enhance accountability within the sector.

The paper has further demonstrated that emerging technologies offer important opportunities for strengthening sustainability outcomes through improved monitoring, transparency and efficiency. Nevertheless, technological innovation cannot substitute for justice, democratic governance and political goodwill.

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[65] African Development Bank Group, *African Development Report 2012: Towards Green Growth in Africa* (2013)

[66] Extractive Industries Transparency Initiative (EITI), *Standard 2023.*

[67] United Nations Economic Commission for Africa (UNECA), *Economic Report on Africa 2019: fiscal Policy for Financing Sustainable Development in Africa* (Addis Ababa: UNECA, 2019)

References

African Development Bank Group, African Development Report 2012: Towards Green Growth in Africa' available at https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/African_Development_Report_2012.pdf?utm_source=chatgpt.com

Cedric R., "*Accountability of Multinational Corporations for Human Rights Abuses*," (2018) 14 (2) Utrecht Law Review 1.

Corporate Finance Institute (CFI), "*ESG (Environmental, Social and Governance)*" available at https://corporatefinanceinstitute.com/resources/knowledge/other/esg-environmental-social-governance/

Extractive Industries Transparency Initiative (EITI), Standard 2023, available at https://eiti.org/sites/default/files/2023-06/2023%20EITI%20Standard.pdf

Financial Times Lexicon, "ESG", available at https://markets.ft.com/glossary/searchLetter.asp?letter=E

Henrik S., '*Technology and Sustainable Development: The Promise and Pitfalls of Techno-Solutionism*' (Routledge 2023)

Institute of Sustainability Studies, '*The Role of Technology in Sustainable Development' (Institute of Sustainability Studies),* available at https://instituteofsustainabilitystudies.com/insights/guides/the-role-of-technology-in-sustainable-development/

McClay R, "*Understanding the Oil and Gas Industry: A comprehensive Overview*," Investopedia, available at https://www.investopedia.com/investing/oil-gas-industry-overview/

Muigua, K., '*Break Down the Borders: Using Technology to Reunite Africa for Trade, Innovation, Climate Justice and Sustainable Development*', available at https://kmco.co.ke/articles-publications/break-down-the-borders-using-technology-to-reunite-africa-for-trade-innovation-climate-justice-and-sustainable-development/

Muigua, K., '*Embracing Environmental, Social and Governance Tenets for Sustainable Development*' available at https://kmco.co.ke/wp-content/uploads/2023/08/ESG-BOOK-.pdf

Muigua, K., '*Oil and Gas Extraction in Africa: Employing ESG Tenets for Sustainability and Conflict Management*' available at https://kmco.co.ke/articles-publications/oil-and-gas-extraction-in-africa-employing-esg-tenets-for-sustainability-and-conflict-management/

Norton Rose Fullbright, '*Environmental, Social and Governance (ESG): managing Risk and Creating Longterm Value*', available at https://www.nortonrosefulbright.com/en/services/203f40d1/environmental-social-and-governance-esg

OECD, ESG Investing and Climate Transition: Market Practices, Issues and Policy Considerations (Paris: OECD Publishing, 2021), available at https://www.oecd.org/finance/ESG-investing-and-climate-transition-Market-practices-issues-and-policy-considerations.pdf

Organisation for Economic Co-operation and Development (OECD) Environmental Justice: Context, Challenges and National Approaches (OECD Publishing 2024), available at https://doi.org/10.1787/57616eb4-en

Organisation for Economic Co-operation and Development, "*Environmental Social Governance (ESG) Investing*," available at https://www.oecd.org/finance/esg-investing.htm

Organisation of African Petroleum Producers (APPO), Annual Statistical Bulletin.
Peterdy K & Miller N, "*What is ESG*?", Corporate Finance Institute, available at https://corporatefinanceinstitute.com/resources/esg/esg-environmental-social-governance/
Ross ML, "*The Oil Curse: How Petroleum Wealth Shapes the Development of Nations"* (Princeton University Press, 2012)
Sachs JD and Warner AM, "*Natural Resource Abundance and Economic Growth*," NBER Working Paper No. 5398 (1995)
Stuart LG, "*Firms and Social Responsibility: A review of ESG and CSR Research in Corporate Finance*" (2021) 66 Journal of Corporate Finance
U.S. Environmental Protection Agency, "*Environmental Impacts of Oil and Gas Extraction.*"
United Nations Development Programme, '*What is the Sustainable Energy Transition and Why is it Key to Tackling Climate Change*?" available at https://climatepromise.undp.org/news-and-stories/what-sustainable-energy-transition-and-why-it-key-tackling-climate-change
United Nations Economic Commission for Africa (UNECA), Economic Report on Africa 2019: fiscal Policy for Financing Sustainable Development in Africa (Addis Ababa: UNECA, 2019)
United Nations Economic Commission for Africa, Advancing Technology Transfer for Sustainable Development in Africa (2023), available at https://www.uneca.org/sites/default/files/TCND/STIF2023/Advancing_Technology_Transfer.pdf
United Nations Economic Commission for Africa, Advancing Technology Transfer for Sustainable Development in Africa (2023)
United Nations Environment Programme (UNEP), Environmental Assessment of Ogoniland (Nairobi:2011)
United Nations Environment Programme, Environmental Rule of Law: First Global Report (UNEP 2019)